

**THE INTERNATIONALISATION OF THE BRITISH CONSTRUCTION
CONSULTING SECTOR AND TECHNOLOGY TRANSFER IN DEVELOPING
COUNTRIES**

NIGEL R MANSFIELD

BSc MBA C Eng MICE MIHT MIWEM MAPM MBIM

STRATHCLYDE INTERNATIONAL BUSINESS UNIT

DEPARTMENT OF MARKETING

STRATHCLYDE BUSINESS SCHOOL

UNIVERSITY OF STRATHCLYDE

GLASGOW

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ABSTRACT

The thesis was written against a backdrop of increasing international competition in the construction consulting sector when, at the same time, there was apparent growth in the requirements of developing countries for technology transfer. The opening chapters describe the industry including specific aspects of the British sector. A theoretical review is given on the eclectic theory, the stages-of-development approach, strategic theory and professional services literature, as well as technology transfer material and empirical studies relevant to the sector. The study itself is based upon a series of personal interviews with a range of construction firms, leading to sixteen cases being compiled, mostly for consulting firms but also for client organisations, aid agencies, contractors and suppliers. The interviews were also used to test hypotheses in four main areas of concern, covering the nature and extent of technology transfer, types of projects and firm, cooperative arrangements and long term implications. There were a number of findings: In construction consulting, technology transfer, consisting mainly of management know-how, is increasingly being required by overseas clients and aid agencies. Technology transfer changes the organisational structure of a firm, due to the greater need for staff at senior levels, with international experience. Newly internationalised firms, often medium-sized, can sometimes by-pass the stages of internationalisation by locating directly in client offices on technology transfer projects; while joint ventures occur, the role of established subsidiary offices is diminishing. Unlike contractors, construction consultants can sustain competitive advantage over time via technology transfer projects; clients can be accessed more effectively at lower cost and market information on new projects can be gleaned more readily. Wider conclusions were also discussed which had relevance for international business theory and policy of host governments and firms alike.

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THESIS AIMS AND INTRODUCTION

"To establish the factors necessary for the successful internationalisation of the British international construction consulting sector with particular reference to technology transfer in developing countries". This describes the overall aim and there are a number of objectives (which are explained more fully in each of the chapter summaries, appearing in the main text).

The thesis was written against a backdrop of increasing international competition in the construction consulting sector when, at the same time, there was apparent growth in the requirements of developing countries for technology transfer. The author's interest is as a practitioner in the field where an increasing number of comments were being made about the importance of technology transfer in international competitiveness. The British sector has in many ways been pushed into internationalisation because of problems in the domestic market and many companies seem uncertain as to how to deal with technology transfer.

While internationalisation studies have been undertaken in the wider service sector, less work appears to have been carried out in construction services, although in international contracting, which tends to be a more "visible" side of construction, some has taken place. Construction consulting by comparison has not received the same attention. This thesis attempts to redress this imbalance.

The study is based upon a series of personal interviews with a range of construction firms, mostly in consulting. Sixteen cases have been compiled, four of them encompassing areas relating to consulting, these being client organisations, aid agencies, contractors and suppliers. Thirty two interviews were conducted to build up the case studies. These interviews were also used to test hypotheses in four main areas of concern to consulting firms engaged in technology transfer. These hypotheses covered the nature and extent of technology transfer, types of projects and firm, cooperative arrangements and long term implications. Each was built up from the first five chapters of the thesis. The conclusions which appear in later chapters have relevance for international business theory and policy of host governments and firms alike.

The opening chapter describes the international construction consulting services industry, its main characteristics, the competition and main players, as well as the way that internationalisation manifests itself. Chapter 2 emphasises more specific aspects of the British sector. A theoretical review is then conducted in the third chapter; this introduces various early and recent theories which have given rise to the eclectic paradigm. Some consideration is also given to matching its application to construction services. The intention in this theoretical chapter is to approach the subject from several different angles. The stages-of-development approach is described and some aspects of strategic theory (including Porter's) are examined. Professional services theory is incorporated to enable a more focused view of consulting to be taken. Chapter 4 sets out to discuss the subject of technology transfer from a general perspective but most of the chapter is taken up with its application in constructing consulting.

An empirical review in Chapter 5 describes the findings of some recent studies involving the author in the area of construction consulting. This underlines many of the practical issues which are investigated in the main body of the empirical work of later chapters. The methodology is discussed in Chapter 6. In Chapter 7 the sixteen case studies are described in detail. Analysis of the findings supporting, or not supporting, the hypotheses are covered in Chapter 8. A summary is given at the end of this chapter on the main findings. The next chapter assesses the contribution to the literature made by the study. The eclectic theory, the stages-of-development approach, strategic and professional services theory each receive some assessment here. The penultimate chapter provides policy recommendations for consulting firms and other participants such as contractors and suppliers, host and home governments as well as aid agencies. The final chapter assesses the contribution of the thesis to selected policy issues, makes suggestions for future work, evaluates the methodology and discusses briefly how the topic might have been tackled differently. The Appendix includes some further tables, the questionnaire used in the study and a selection of relevant publications by the author in the field of construction consulting.

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My appreciation are expressed to Jean Dick for taking the typing of the thesis in her stride and greatly improving the quality of text, tables and figures.

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My wife and three sons have often had a preoccupied husband and father; they have always been supportive and understanding, perhaps wondering at the large amount of time invested.

The christian writer Hallesby said 'there is no one so poor as he for whom no one is praying', and I thank many friends who have done that for me. A guiding principle throughout has been one day off in seven. I am sure this has contributed to my own equilibrium and to family cohesion.

CHAPTER 1 THE INTERNATIONAL CONSTRUCTION CONSULTING SERVICES INDUSTRY

1.0 SUMMARY OF CHAPTER 1

- 1. Consulting engineering services form a significant part of the construction services industry.**
- 2. Consulting, as part of the services sector, commonly involves considerable interaction with the client and is staff intensive.**
- 3. Consulting engineering firms are involved in project feasibility, design and supervision of construction. The two other main parties are the client and the contractor.**
- 4. The consulting product is non-standard and intermediate and mobility is required. Project size and complexity affect entry into the industry of new firms. Construction is an "investment good" forming up to one tenth of GDP in some middle income countries. Host governments' own sources and international aid funding both figure prominently in consulting projects. Service sector invisibles have grown in importance in the last two decades.**
- 5. Most developing countries are still very weak in consulting services, although aid agencies have supported the development of a local capability.**
- 6. Internationally no one firm dominates the market, although the USA and UK share almost half of it, Asia being currently the most popular region. Agencies, such as the World Bank, have a key role to play throughout the world.**
- 7. International consulting business is often initiated and sustained through networks of relationships. Consortia groupings and piggy-backing are useful for smaller firms with limited resources. An overseas agent and significantly joint ventures with a local consulting firm, leading to full subsidiary offices abroad, are the further stages of internationalisation. Licensing and franchising are most uncommon in consulting but all-in contracts such as package deals, turnkey, "boot" and management contracts all provide a variety of organisational approaches for international consulting firms.**
- 8. There is a dearth of engineering capability in some less developed countries, not least in consulting quarters.**

9. Those firms who can offer suitable expertise will likely find a steady call on their services: several possibilities exist for wider involvement of consulting firms in technology transfer activity.

1.1 CONSULTING ENGINEERING WITHIN THE CONSTRUCTION INDUSTRY

The Standard Industrial Classification for "Construction" defines the "industry" as covering all the major activities associated with buildings and civil engineering such as "erecting and repairing buildings ...constructing and repairing roads and bridges ..." to "flooring, plastering, plumbing... hiring plant and scaffolding".(1)

Hillebrandt defined the Construction Industry somewhat wider to cover "all those parties involved in the construction process including the professions, the contracting sector (found within the HMSO definition) and, to some extent, the suppliers of inputs to the needs of construction clients". (2)

The Institute of Marketing has recognised a further distinction between civil engineering and building: it has defined the civil engineering Industry as "most of that part of the construction industry which is concerned with the design, construction, maintenance or demolition of the economic infrastructure of the roads, and other communication facilities, and public works". The Building Industry has been similarly defined, except that it covered "...all types of building". Orsaah noted that there was very little to choose between the two industries and they were better referred to under one heading of "construction industry". (3) Here it is the civil engineering side of the industry which receives the greater emphasis, although building is not thereby excluded.

According to Wells, contractors have usually received the most attention whenever the construction industry has been studied.(4) Neo (5) and Seymour (6) are two examples of this. Coverage of Consulting Engineering has been much less by comparison. Two major reasons for this may be that firstly contractors are more obvious because they handle that part of the construction process which is most publicly on view: and secondly that contractors usually publish annual accounts. The particular area covered therefore, in this work, is the Consulting Engineering side of the Construction Services Sector, which is termed here Construction

Consulting Engineering Services: (often this is shortened to the term Construction Consulting). The place of Consulting Engineering and its importance are now described more fully in relation to other parties in the Construction Sector.

1.2 THE SERVICES SECTOR AND CONSULTING

The services sector has a number of distinct features such as intangibility, inseparability, non-standardization and product perishability. (7) The more usual activities covered under services are: "accounting, advertising, banking, business, professional & technical services, communications, construction & engineering, health, information, insurance, legal services, entertainment, tourism and transportation". (8)

Generally services can be grouped according to the relationship that the service organisation has with its client or (customer) with particular respect to how much room there is for customisation or judgement, what the nature of supply and demand for the service is and how the service is to be delivered. (9)

Consulting services contain a major element of intangibility coupled with the need for high credence qualities on the part of the client. (10) Any professional service activity (such as consulting engineering) usually involves a high degree of interaction with the client as well as a high degree of customisation. (11) There are not inconsiderable staffing priorities required in consulting: leading them to operate with low amounts of capital and relatively high levels of staff, or labour (12)(see Table 1-1) (13)

1.3 MAIN PARTIES IN THE CONSTRUCTION CONSULTING SERVICE SECTOR

Participants

There are many participants in the construction process. These consist of clients who place the orders and who are often the end users as well, professional firms (consisting of consulting engineers, architects & quantity surveyors) and contractors. The range in size is from small firms up to large companies and these cover building and civil engineering activities, which themselves incorporate

LABOUR INTENSITY OF SOME BROAD SERVICE GROUPS

LOW LABOUR-INTENSITY SERVICES CAPITAL : LABOUR RATIO

Electric Utilities, Gas Sanitation Services	14.21
Communications	5.31
Hospitals	
- Teaching	1.59
- For Profit	1.63
- All other (e.g. community)	1.75
Auto & other Repair	1.60
Transportation	1.27
Banking	1.20
Hotels etc.	1.01

HIGH LABOUR-INTENSIVE SERVICES

Security, Commodity Brokers	0.15
Insurance Agents & Service	0.18

Business Services (e.g. advertising, credit reporting, mailing & reproduction, building services, personnel supply, computer & data processing, management consulting & public relations) 0.42

Personal Services (e.g. laundry, photo, beauty barber shops, funeral services) 0.53

Wholesale Trade 0.54

Retail Trade 0.62

Source : Schmenner (86)

TABLE 1-1

mechanical, electrical and process elements. (14) There are also related capital goods manufacturers and suppliers. However, the main parties involved in a traditional civil engineering project, with whom the consulting engineer relates are the client and the contractor, which are each now given greater description.

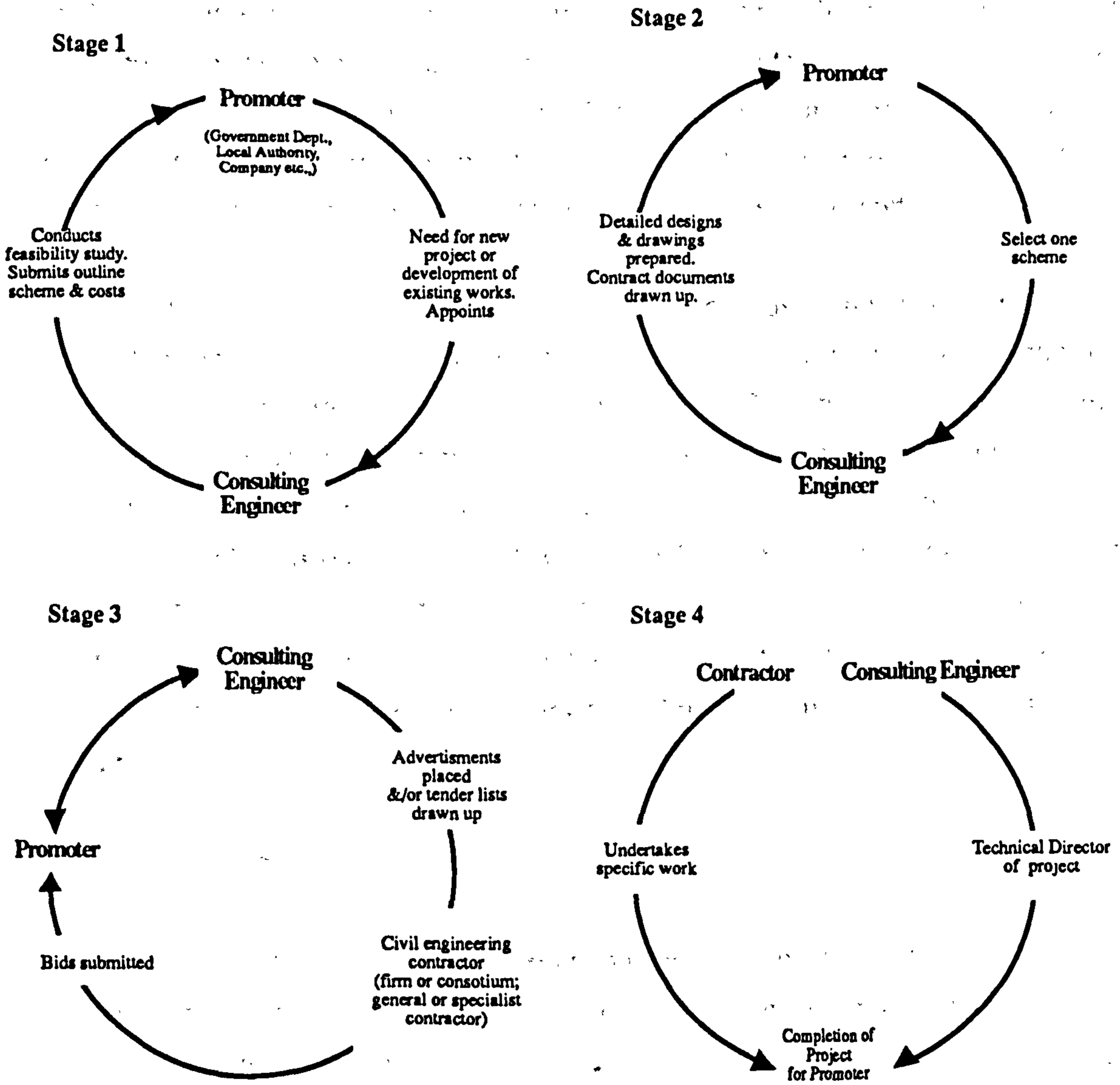
In the public sector, the client can be a government department, public corporation, nationalised industry or a local authority: alternatively in the private sector it can be a company, such as a large multinational developer, a group of people or just an individual. The decision-makers on projects could be at various levels within a client's organisation depending on the project. Host country clients sometimes have sufficient strength within their own in-house engineering organisation to carry out all or part of the project work themselves. However, on larger international projects, a consulting engineering firm is often commissioned to act for the client as the Engineer, which involves accountability for management and technical direction of the project. The way the parties interrelate in a conventional civil engineering project and the activities employed are illustrated in Figure 1-1. (15)

The Consulting Engineer

Throughout the world, consulting engineers are involved in conceptualisation of projects, preparation work prior to the contract stage, and supervision of construction. Usually a client will look to the consulting engineer to advise on all technical aspects of the work, but there is a growing expectation from the client that other services such as training and finance will be provided as well.

The basis on which international consultants are selected can be the firm's general experience in the field of the assignment, and the adequacy of the particular proposed work plan and approach in responding to the terms of reference. The effort and resources required to implement this, as well as the qualifications and competence of the personnel proposed for the assignment are also major considerations. Strict adherence to these criteria can often lead to the exclusion of a local host consulting firm in the host country. (16) In order to match such requirements, consulting engineers build up their own reputation based on expertise, integrity, personal service etc. Personal rapport between the firm's

ORGANISATION OF CIVIL ENGINEERING CONSTRUCTION INDUSTRY



Note: Promoter = Client

Source: Adapted from: Hood, Mansfield, Stanbury, Young. (84)

FIGURE 1-1

principals and the decision makers in the client organisation can have an important bearing on the choice that is made. (17)

At the bidding stage, when selection of a firm occurs, there are essentially three types of bidding system, in which the consulting firm might engage: open, selective and negotiated. In the "open" system the brief is sent to all consulting firms who apply and there is no limit to the numbers of returns. Selective tendering is the most common and has gradually replaced the negotiated system, although certain clients still prefer to deal with one firm who acts as their sole adviser, if necessary in a managing capacity. Selective tendering or bidding, which is encompassed by fee competition in domestic consulting, is expanded on in Chapter 2.

In the initial stages of a construction project, a proposal report is usually carried out, often leading on to a more comprehensive feasibility study when a number of priced alternatives are offered. (See Figure 1-1). This may then be followed by the detailed design stage which provides calculations, drawings and documentation, prior to tendering and the contract award, when construction is undertaken. Supervision of construction may follow in addition, and this can involve monitoring the contractor's work and making recommendations on payment, and sanctioning claims for extra work. (18) Technology transfer may also be a further requirement of clients, and this is shown in Porter's value chain which appears in Chapter 3.

The Contractor

At the construction contract stage, prequalification of contractors may be required: a consultant could be involved here on behalf of the client in vetting of contractors. (19) On a traditional project, the client has a contract with the main contractor who is responsible under the contract for all the other subcontractors & suppliers. The contractor who traditionally concentrates on the construction phase of the work has the task of acquiring materials, organising labour and carrying out the work. In certain cases a client may elect to nominate a particular supplier as say in the supply of some major equipment from a capital goods manufacturer with whom the client and consulting engineer may have been in consultation throughout the design stage.

1.4 THE CHARACTERISTICS OF THE CONSTRUCTION INDUSTRY

Features of the Consulting Product

At this point, it is appropriate to examine salient features of the construction industry as relevant to consulting. Unlike manufacturing, there are few opportunities for mass production: while a certain amount of repetition is possible in some subparts of construction, very little is possible in the actual overall process itself. Indeed, Wells has argued that there is no such thing as a standard construction product.⁽²⁰⁾ Although designs may appear to have similarities, there is a certain uniqueness about each construction product that is not found in the manufacturing sector, due to the specific nature of the location. This uniqueness is particularly so in civil engineering works where geotechnical and land considerations have a greater influence on the design of the product. The building side of the industry is less influenced and it is more possible here to achieve economies of scale through similar repetitive phases of building construction. ⁽²¹⁾

There is a certain irreversibility about the actual construction process itself, seeing that the services of the construction firm can be sold only once in any project. "Once the service is sold, it becomes embodied in the final product which is custom built for the client".⁽²²⁾ Compared to most consumer products, construction consulting is expensive and there is a much longer time scale for its production. In consulting this can amount to a period of many months or years, longer in fact than the constructional contract period. The consultant's work does not have to be so continuously tied to the site although the product being produced is specifically related to it. Usually the detailed design phase is not begun until a commission (contract or order) has been placed.

Demand in Construction

Construction activity can play a "dynamic role in the process of economic growth and development".⁽²³⁾ This is due to the products of the sector being "capital" or "investment" goods. These are not consumed for their own sake only, but they contribute to the "production of other goods and services or means of production". The construction process is thus intermediate in that it involves the creation and transformation of designs and associated services into a final product, such as a

completed bridge, road or hospital etc. (24,25,26) Approximately one half of all investments in capital goods are in the products of the construction sector in both rich and poor countries". (27) According to Seymour, the contracting product that is offered relies upon "human rather than physical capital... which comes down to technical and managerial competence and also experience" (28) and this is even more so in consulting.

In any country, when the economy has suffered even slight setbacks, it has led to private sector clients postponing investment plans for new facilities. Governments similarly have regulated demand by cutting back on project work in the public sector. (29) For instance, any nation's government ministries can easily control the amount of funds released for new motorways or they can boost or restrict the school building programme. Some of these activities are related to national preference or, in the case of airports, the demand for air passenger flights which is a function of individual prosperity.

Demand for construction services can also be linked to growth in population. In the latter part of the 20th century the population of the world is expected to expand from 5 to 6.5 billion with nine tenths of this occurring in developing countries.(30) Such changes are likely to lead to increased demand in construction in the nineties although where this occurs in the very poorest countries, as the next section shows, there may still be severe constraints on future construction growth.

Construction work can be regulated by the Government's own management of the economy indirectly as, for instance, in raising interest rates, or directly via various public sector organisations who act as clients. Because of the length of some projects it is sometimes undesirable to restrict funding already committed so that instant regulation of expenditure on construction is not quite so easily achieved as would first seem to be the case. Nonetheless demand is cyclical and construction firms have to look around for ways to balance their project portfolios to assure their own supply of work. One way that consulting firms even out their workloads is by pursuing overseas work, such as aid projects. Chapter 5 discusses some of the merits of this activity.

Mobility of Consulting

Neo has also pointed out in contracting that the construction process, and not the physical product, is the mobile element.⁽³¹⁾ As has been shown, for the most part, consulting firms cannot generate demand and they must therefore move some of their service to the geographical area where demand is located. In consulting engineering this means that a visible presence, in the form of an office, is needed to obtain project work and this must be close to the client although the actual design process may or may not be conducted there. Leaving the client's wishes aside, design has to be carried out in conjunction with visits to the eventual construction site particularly in the early formative stages. There must therefore be a significant attachment to the geographical location of the project, which is linked in turn to the form of internationalisation, which is discussed in greater detail later on in the chapter.

Demand for the individual firm is usually based on the dual factors of the firm's project expertise and the local availability and experience in that environment. The supply of firms is also linked to two further factors of note: the size of the project and its complexity. Since financial and technical capability are related to firm size, this can restrict the number of firms able to apply.

Entry into the Industry

For consulting engineers entry for new firms is usually achieved by individuals setting up on their own on the basis of reputations gained on particular projects. The size of projects that can be undertaken is restricted by the resources available to a firm. Firms can enter the industry if they can muster sufficient expertise and know-how: for some they are able to acquire expertise by buying it in. A smaller firm normally would graduate up the scale of competence by successfully taking on larger and larger projects. Unlike contracting, even small firms in consulting can be entrusted with quite large projects although it is still just as necessary to convince the client that the relevant skills are within the firm and there must be a complementary financial capability to fund the business until bills are paid.

Prior to selection by a client, it is necessary for a consulting firm to prequalify in the first instance: a firm may seek to differentiate its product and service from

those of competitor firms by various types of organisational arrangements, which are discussed later on in the chapter. Once firms bid in competition, price becomes more of a determining factor since the terms upon which they bid are specified by the client. However many clients are far from certain as to exactly what they require and there are opportunities to offer a differentiated service which is not necessarily price dependent. Chapter 5 expands upon some factors other than price that contribute to success or failure in the bidding situation for construction service firms.

Gross Domestic Product and Construction Growth

In construction, according to the country selected, value added as a proportion of gross domestic product (GDP) can average at anything between 3 and 8%. Employment in construction has usually occupied a similar share (32) (see Table 1-2). (33) If building materials from other sectors of the economy are also included, this figure can rise to 10 %. In less developed countries value-added is often below 5 % of GDP but here the manufacturing sector is frequently weak and agriculture occupies a larger proportion of the overall economy. (34)

Using two decades of figures from 1960 - 1982, Samad conducted an analysis of national accounts, as found in World Bank sources of information. These indicated that the low income countries are unable to spend much at all on construction: in fact they fall behind in their spending even though they have the most to achieve. On the other hand, others of the low income countries and most of the middle income countries appear to spend much more as a proportion of their overall budgets on construction. This is most certainly due to their great need of infrastructure improvements and also their policy of placing a high priority on the construction budget. Government ministers operating such budgets actually wield considerable powers of influence within the country. As countries become richer however, many of them revert to a situation of allocating less as a proportion of GNP to construction objectives. (35,36,37)

In examining the growth rates of construction, Wells (38) also found that this was greatest in the middle income countries (up to \$ US 2000 per capita). In the two lowest economic category groups (Gp 1 and 2), the construction growth rate was always more than the growth rate of GDP and was ahead of manufacturing except

THE AVERAGE CONTRIBUTION OF CONSTRUCTION GDP, GCF & EMPLOYMENT IN COUNTRIES GROUPED ACCORDING TO INCOME

VARIABLE (under US \$ per capita)	GROUP 1 350	GROUP 2 350-700	GROUP 3 700-2000	GROUP 4 >2000
Value added in Construction as % of GDP	3.6 (23)	5.2 (21)	5.4 (31)	7.3 (27)
Capital formation in Construction as % of GDP	8.9 (13)	10.6 (10)	13.6 (27)	13.5 (23)
Employment in Construction as % of EAP	3.1 (9)	3.4 (14)	6.6 (22)	8.1 (26)
Construction as a % of GFCF	56 (13)	53 (10)	55.4 (26)	57.5 (23)

Note: Figures in brackets represent the number of countries included in each group.

Source : Wells (86)

TABLE 1-2

AVERAGE GROWTH RATES OF CONSTRUCTION IN COUNTRIES GROUPED ACCORDING TO INCOME

VARIABLE (under..US \$ per capita)	GROUP 1 350	GROUP 2 350-700	GROUP 3 700-2000	GROUP 4 >2000
Rate of growth of construction output (% p.a.)	5.9	5.2	8.6	3.6
Rate of growth of GDP	3.5	4.4	5.9	5.0
Rate of growth of manufacturing	5.5	6.4	7.7	6.4
Observations (No. of)	(12)	(14)	(24)	(19)

Note: Growth rates are for the twenty year period 1960 - 1979

Source : Wells (86)

TABLE 1-3

in the very poorest of countries (see Table 1-3). (39) In industrial and high income countries, the trend was reversed and the rate of growth in construction was below that of GDP and also of manufacturing. (40)

For "all" developing countries, the average annual percentage change in GDP has averaged at around 6 % from 1965 to 1980 with a lower figure of about 4 % thereafter. (41) Patterns of construction growth also show that construction has not been as buoyant in the eighties as in the seventies. It can generally be concluded that construction is in the vanguard of developing countries' economic growth and government prioritise their construction budgets accordingly. Groups such as consulting engineers are directly affected by these priorities, particularly if their work is predominantly in developing countries, (as Chapter 2 suggests for British consulting firms).

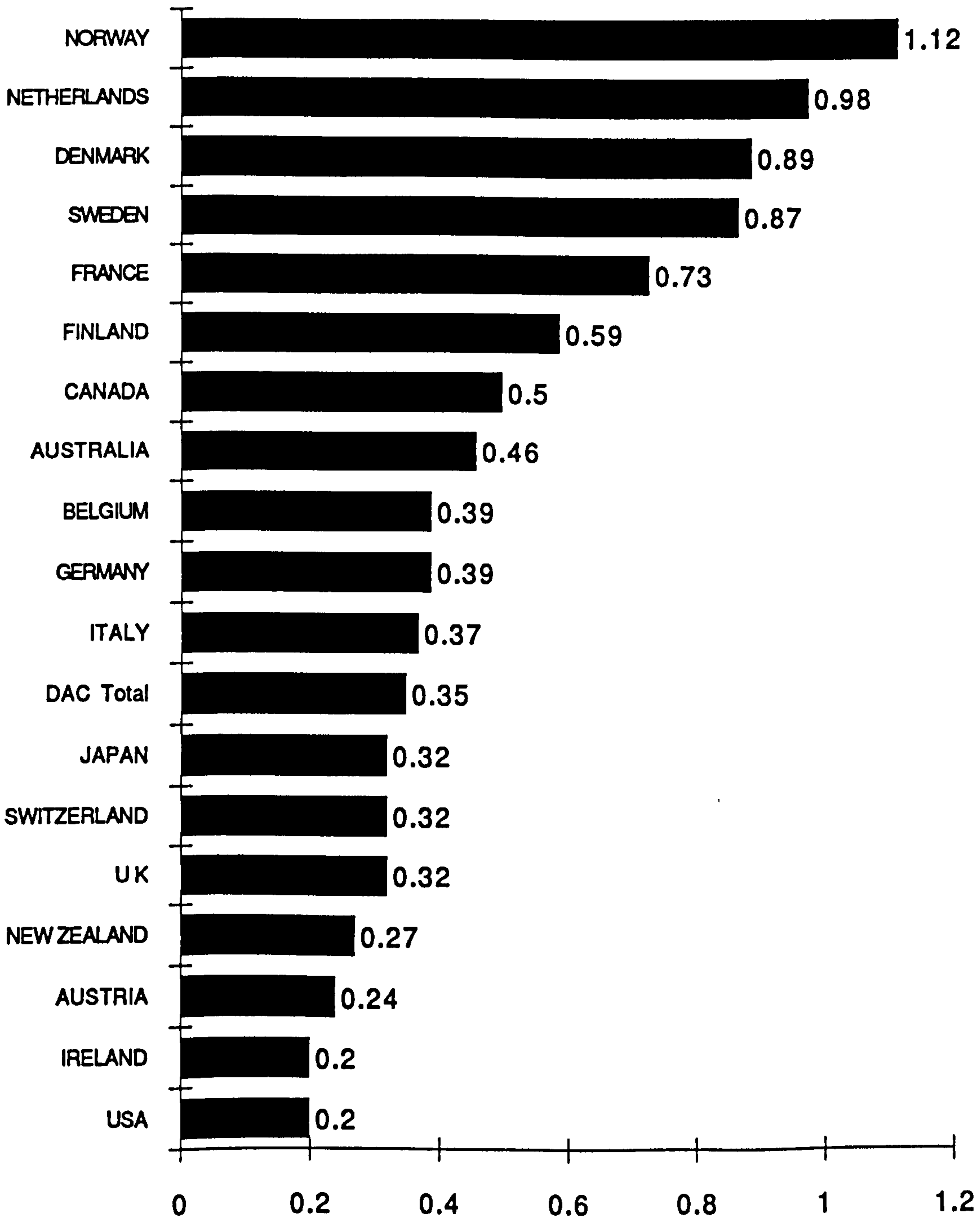
Cash and Credit Arrangements

Most international projects are organised on a cash basis or a credit basis. Cash projects allow payment of money to the construction organisation from the client or aid agency whereas credit projects involve a need to arrange the finance. (42) Throughout the world, credit arrangements vary according to the project under consideration. In Asia, as for example, Indonesia has issued a decree calling for funding of loan periods, up to 25 years, with 7 years grace at 3.5 % interest. This has been in response to Japanese organisations' offers of 30 year loan periods with 10 years of grace and 2.7 % interest. (43)

Aid Funding

Consulting engineers derive a considerable portion of their overseas work from cash projects due to their preference for limited involvement in arrangement of finance. Often this occurs via aid funding which is outwith a host country's own sources of income. Aid from the major developed OECD countries is monitored by their Development Aid Committee (DAC). The total flows of financial resources and net development assistance (ODA) from DAC countries to developing countries and multilateral agencies, has fluctuated considerably in the last twenty years. Countries have given widely different percentages of their GNP (see Figure 1-2). (44) In 1988, this varied from 1.12% to 0.2%, which is in contrast to the

AID AS PERCENTAGE OF GNP 1988



Source : ODA (89)

% OF GNP

FIGURE 1-2

position a decade earlier when the variations were much more in line for all countries. The official development assistance for the main industrial DAC countries is indicated in Table 1-4, (45), amounting to some £27 million in 1988. Aid is usually allocated on a multilateral or bilateral basis.

Multilateral aid tends to be channelled by donor countries through aid agencies with no specific limitations on how the aid will be spent. Bilateral aid, on the other hand, is given with set conditions usually requiring that some of the funding will be spent to procure needed resources from the donor country. In the construction services sector, this has direct benefit for each of the parties described.

The Services Sector and Invisible Earnings

In recent years, the services sector in both developing and developed countries alike has begun to attract a growing share of direct investment. In the seventies, this rose by about 5 % in both sets of countries. The manufacturing sector also grew by this amount in developing countries although this was not reflected in developed quarters. Exports from developed countries have climbed at the expense of developing countries over the last three decades. As far as consulting is concerned it is more meaningful however to examine the area of invisible earnings. (46)

A small number of countries dominate the world's invisible earnings. It is to be noted that just eight countries found their way into the world's top five invisible earners between 1972 and 1986. Of these the USA, UK, France and West Germany were prominent in every year, with the USA and UK being in first and second place on every occasion. In volume terms, the USA has taken a fifth of all invisible exports and Britain has taken one sixth. World invisible trade stayed remarkably constant at about a quarter to a fifth of all trade for the years 1972-86. (47)

1.5 CONSULTING SERVICES IN DEVELOPING COUNTRIES

The Limited Extent of Local Consulting Services

Sapir indicated there was a lack of a centralised body of data on consulting services but he did seek to redress this balance by highlighting some differences between

WORLD AID FLOWS - OFFICIAL DEVELOPMENT ASSISTANCE

DAC COUNTRIES	1984		1986		1988	
	£ M	% OF GNP	£ M	% OF GNP	£ M	% OF GNP
AUSTRALIA	581	0.45	513	0.47	612	0.46
AUSTRIA	135	0.28	135	0.21	170	0.24
BELGIUM	334	0.58	373	0.48	332	0.39
CANADA	1216	0.50	1156	0.48	1314	0.50
DENMARK	336	0.85	474	0.89	518	0.89
FINLAND	133	0.35	213	0.45	342	0.59
FRANCE	2835	0.77	3482	0.70	3907	0.73
GERMANY	2082	0.45	2613	0.43	2639	0.39
IRELAND	26	0.22	42	0.28	32	0.20
ITALY	848	0.28	1639	0.40	1691	0.37
JAPAN	3232	0.34	3842	0.29	5128	0.32
NETHERLANDS	949	1.02	1187	1.01	1252	0.98
NEW ZEALAND	41	0.25	51	0.30	58	0.27
NORWAY	404	1.03	544	1.17	555	1.12
SWEDEN	554	0.80	743	0.85	861	0.87
SWITZERLAND	214	0.30	288	0.30	345	0.32
UK	1070	0.33	1185	0.31	1485	0.32
USA	6518	0.24	6523	0.23	5489	0.20
DAC TOTAL	21508	0.36	25004	0.35	26730	0.35
ARAB COUNTRIES	3266	1.54	3071	1.83	1312	n.a
CMEA COUNTRIES	2546	n.a	3164	n.a	n.a	n.a
OTHER NON DAC COUNTRIES	473	n.a	513	n.a	385	n.a

Source : ODA (89)

TABLE 1-4

developed and developing countries, using information from the World Bank on the local and foreign inputs to projects. During the period 1971-80, project disbursements amounted to \$30 billion of which just under half was allocated to equipment suppliers, a third to construction, 13 % to miscellaneous goods & services and 7 % to consulting. (48)

While the developing country local sector possessed certain comparative advantages in the "construction" phase with slightly more than half of the market, the position of consulting services and equipment suppliers was relatively weak, representing only around 15 % of the market. Although there were increases in the share of local suppliers to construction over the period, there was no comparable increase in consulting. He observed that at the early stages of a country's development, activity tended to be "concentrated in construction and civil engineering as well as in preinvestment services in general". As industrialisation progressed the scope of consulting widened to include a greater number of industrial projects. (49)

Development of a Local Capability in Consulting Services

By the eighties, Dickerson expressed the policy of the World Bank as "supporting the development of local capability and the promotion of the intellectual and practical development of a country's human resources". One evidence of this was that "25 % of the Bank's disbursement for consulting services went to local consultants". This supported the figures of Sapir and suggested there had been some significant increases even in the early eighties (from 15 to 25 %). Despite this trend, the Bank was reluctant to oversupport "local firms who had not yet acquired the necessary skills and experience". (50)

Taking as an example one particular country (Indonesia), a review was made of government contracts there and for medium to large projects in 1983 it was found that, in terms of manmonths, just over half of all engineering work was done by foreign consulting companies, but in terms of money the foreign companies share was almost three quarters of the value of the engineering work. Where local consultants are used, most of the good consultants were overloaded with work: and much of the capability that was left was split up between a variety of small firms who on their own lacked the capability to carry out even a medium sized project. (51)

According to Abbott the development of a local construction sector in the host country has been more difficult to achieve for consulting than for contracting, since they have to face the same kind of constraints and many more, "such as lack of work continuity and consequent cash-flow problems, a lack of commercial knowledge, irregular selection procedures, inadequate rates of pay and payment delays as well as the tendency for the government to use in-house technical departments rather than private sector firms". Obtaining track record and experience also seems to take far longer than the equivalent in the contracting sector. None of this has been helped by the fact that government clients have often paid lip-service to the improvement of local industry, and yet have persisted in directing demand to international firms. (52)

Faced with such a situation it is not surprising that many developing country clients have been calling for technology transfer arrangements to be incorporated into their projects. Before this topic is discussed further it is necessary first to identify the competition and some of the major players in the international consulting sector.

1.6 COMPETITION, PLAYERS AND RELATED INTERNATIONAL ORGANISATIONS

The Climate of Competition

The process of seeking out and bidding for international projects is onerous for the consulting sector and is one of the major differences between domestic and international projects. Although firms will have many projects running at different stages at any one time, consultants must maintain a balanced cash flow and be able to finance a small number of projects out of working capital. Levels of work in the international market are high and this attracts a greater number of international competitors. As a result, many clients find themselves in a strong position of being able to call for onerous bonding conditions: these add to many of the other risks that consultants face such as currency fluctuations and late payment as well as working in a highly competitive environment.

According to Seymour, competition in international construction does not take place in a true oligopoly, because "none of the firms have a large enough share of the

market to make a significant contribution to total market output: oligopolistic influence is limited by client powers and barriers to entry may not be efficient". (53) In international consulting, although there are many large international firms, no one of them has any significant share of the market. The international industry is mainly represented by upwards of 200 firms, some of which are now described.

Major Players In International Consulting

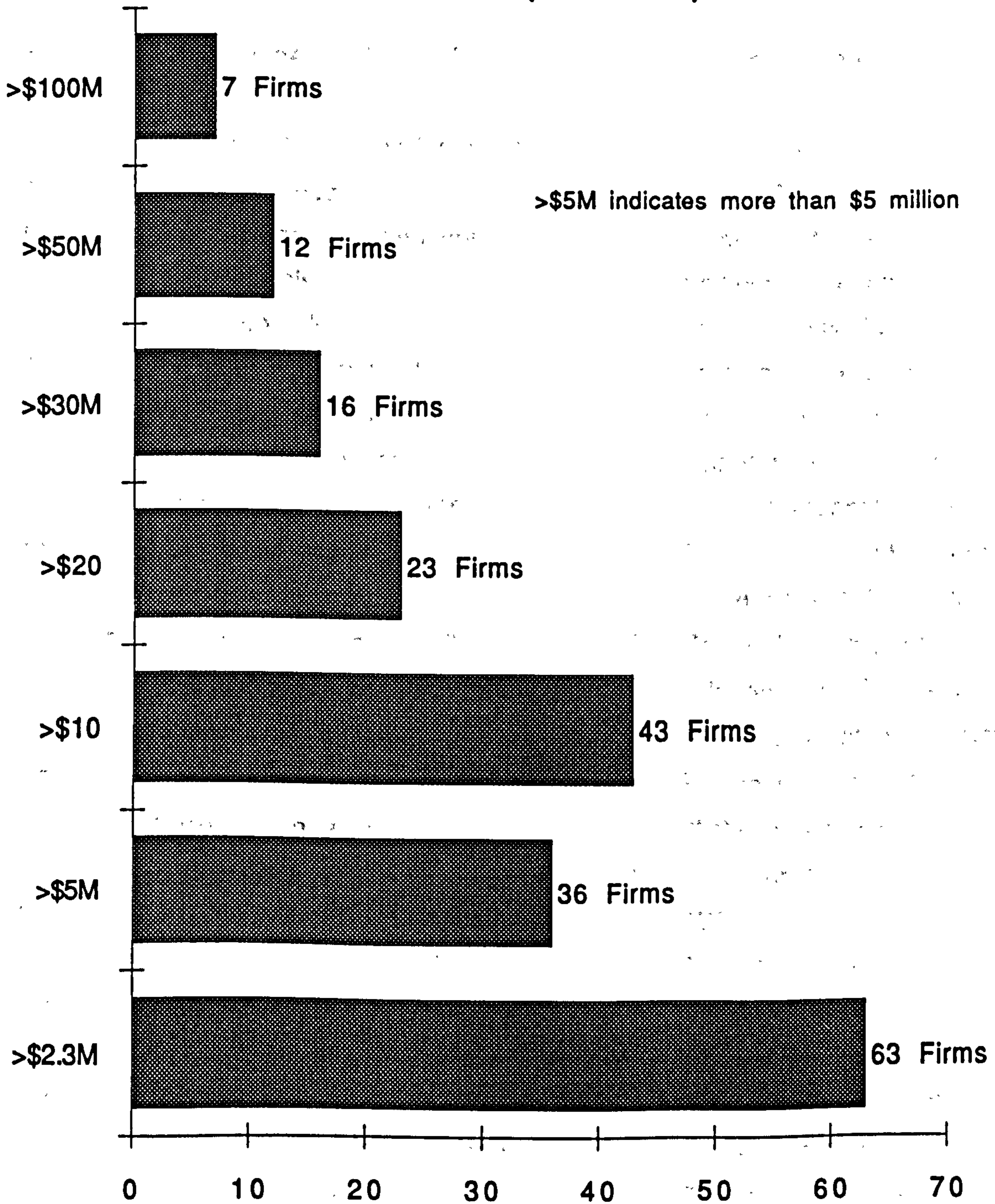
In terms of the top 200 consulting design firms in the world in 1989, as recorded by size of foreign earnings per firm, there were some ten firms only with over \$100 million in 1988, twenty firms with over \$ 50 million and a hundred with over \$ 10 million (see Figure 1-3). (54) As regards the world's top firms, it is not very meaningful to highlight any single firm in the world because none of them thoroughly dominate the market. For instance, only five of the top ten firms in 1983 were still in that position in 1988 (see Table 1-5). (54,55)

Taking the top 50 or so firms, listed in the same table, it is apparent that between 1983 and 1988 the USA was the country with the largest representation. Canada, West Germany, UK and the Netherlands all increased the number of their firms, while USA and France reduced: Japan, Sweden, Finland, Belgium, Norway, Italy and Switzerland held their own. For some countries (i.e. the Netherlands), there has been a tendency to have only the very largest of firms competing in the world market, whereas countries such as the UK have a greater number of firms scattered down the spectrum: (the British consulting sector receives wider discussion in the next chapter).

In the main continents of the developing world, of all foreign commissions obtained in 1982, the Middle East accounted for two fifths, Africa and Asia a quarter each and Latin America a tenth. However by 1988, Asia moved into the ascendancy (two fifths) with the Middle East dropping back to being much the same as Africa (a quarter) (see Figure 1-4). (55,56)

As regards the attractiveness of the world's regions, by value of foreign fee earnings, Asia (\$1150 m) was the most popular market in 1988, followed by Africa (\$824 m), the Middle East (\$ 809 m) and then Latin America (\$ 322 m)

TOP INTERNATIONAL CONSULTING FIRMS FOREIGN EARNINGS (\$ MILLION)



Source : ENR (89)

FIGURE 1-3

WORLD'S TOP CONSULTING FIRMS IN 1983 & 1988 (* marks British Firms)

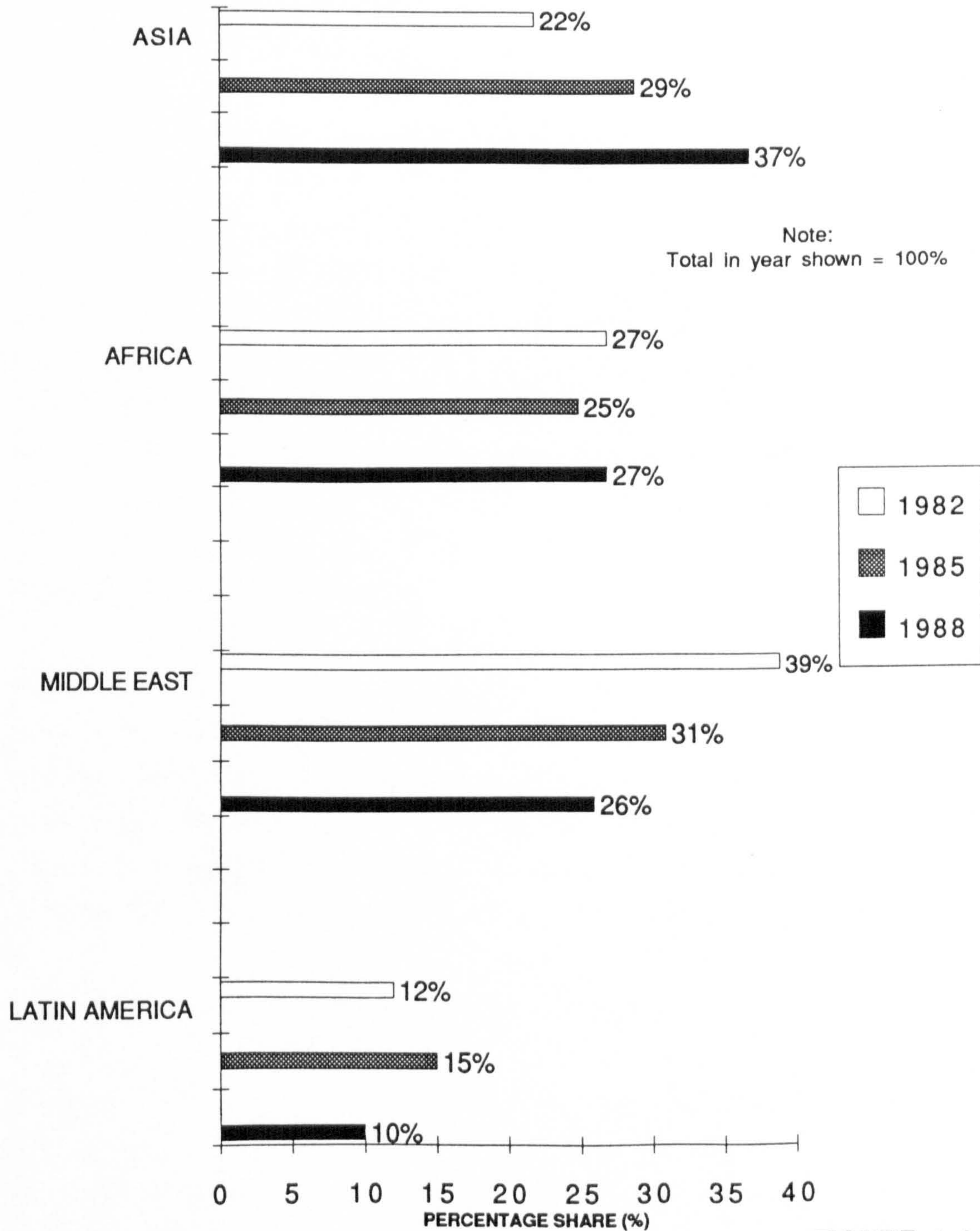
	1983	1988
1	Louis Berger (US)	Lavelin (Canada)
2	Holmes & Narver (US)	CRSS (USA)
3	International Engineering (US)	Louis Berger (US)
4	Lavelin (Canada)	NEDECO (Netherlands)
5	Dar Al-Handasah (Lebanon)	Holmes & Narver (US)
6	NEDECO (Netherlands)	Nethconsult (Netherlands)
7	* Ove Arup (UK)	Jaakko Poyry Oy (Finland)
8	Planning Research (US)	Tractebel (Belgium)
9	Tractionel (Belgium)	Simons Intl (Canada)
10	Norconsult (Norway)	Nippon Koei Co (Japan)
11	* Scott Wilson (SWK) (UK)	Dar Al-Handasah (Egypt)
12	CRS Srrrine Inc. (US)	Fugro-McClelland (Neth)
13	SNC Group (Canada)	Energoprojekt (Yugoslavia)
14	* Sir William Halcrow (UK)	* Mott McDonald (UK)
15	Sofresid (France)	Lahmayer (W Germany)
16	Nippon Koei Co (Japan)	Pacific Consultants (Japan)
17	Daniel, Mann (US)	Electrowatt Eng (Switz)
18	Naco (Netherlands)	SNC Group (Canada)
19	Warley Engrg (US)	* Ove Arup (UK)
20	BCEON (France)	BCEON (France)
21	Jaakko Poyry (Finland)	DHV (Netherlands)
22	Motor Columbus (Switzerland)	* Maunsell (UK)
23	Pacific Consultants (Japan)	Hill International (US)
24	* Sir Alexander Gibb	Golder Assoc.(Canada)
25	SOGREAH - SOGELERG (France)	* Ewbank Preece (UK)
26	King-Wilkinson (US)	Rail India TES (India)
27	* Ewbank Preece (UK)	Sargent & Lundy (US)
28	Monenco (Canada)	SOGELERG (France)
29	Maunsell (UK)	Harza Engineering (US)
30	Electrowatt (Switzerland)	Bonificia SpA (Italy)
31	SWECO (Sweden)	Monenco (Canada)

32	Gibbs & Hill (US)	Frederic R Harris (US)
33	* Binnie & Ptns (UK)	* Acer Consultants (UK)
34	Harza Engineering (US)	* Scott Wilson (SWK) (UK)
35	Fichtener Consulting (W Germany)	Suter & Suter (Switzerland)
36	Lahmeyer (W Germany)	Euroconsult (Netherlands)
37	* W S Atkins (UK)	De Leuw Cather (US)
38	Skidmore (US)	* Binnie & Ptns (UK)
39	Nucleare Italiana (Italy)	Norconsult (Norway)
40	* Merz & McLellan (UK)	SWECO (Sweden)
41	SERETE (France)	ICF-Kaiser (US)
42	Gilbert/Commonwealth (US)	Lester B Knight (US)
43	* Mott Hay & Anderson (UK)	Dames & Moore (US)
44	SORFETU (France)	Carl Bro Group (Denmark)
45	A Epstein (US)	* Sir William Halcrow (UK)
46	Kampsax (Denmark)	Parsons Brinckerhoff (US)
47	Acres Consulting (Canada)	Cowiconsults (Denmark)
48	Khatib & Alami (Lebanon)	Dorsch Consult (W Germany)
49	De Leuw, Cather (US)	Sandwell Swan (Canada)
50	Litwin S A (France)	Weidleplan (W Germany)
51	Weidleplan (W Germany)	* Sir Alexander Gibb (UK)
52	McClelland Engineers (US)	* W S Atkins (UK)
53	The Kuljian Corp (US)	GOPA Consnts (W Germany)
54	Doxiadis Assoc (Greece)	* WLPU Consultants (UK)
55	Hidroservice (Brazil)	Ralph M Parsons (US)

Source : ENR (84) (89)

TABLE 1-5

TOP INTERNATIONAL CONSULTING FIRMS GEOGRAPHICAL DISTRIBUTION OF DEVELOPING COUNTRY AREAS BY YEAR



Source : Author's analysis of ENR (83, 86, 89)

FIGURE 1-4

(see Table 1-6). (57,58,59) The shift in the popularity from the Middle East to Asia is further illustrated by the number of offices of the top 200 firms in the world in two of the larger countries: Saudi Arabia recorded a drop from 129 offices in 1983 to 82 offices five years later, while Indonesia by contrast rose from 85 to 111 offices in the same period.

Developing Country Consulting Services

As has already been observed, developing countries remain very weak in the area of consulting services. (60) Of all work undertaken overseas, less than 5 % can be put down to developing country firms, these being represented by such nations as Egypt, Brazil, India and Taiwan. (61) It would be true to say therefore that, even in the eighties, the industrialised countries' position has remained relatively unchallenged for consulting services, particularly in those areas which are most technology-intensive.

Funding Sources Overseas

In view of the relatively underdeveloped nature of local financial institutions in many host countries, relationships with the international financial agencies are a valuable asset to consulting engineers and are therefore pursued by them. This is all the more important because such agencies directly influence the commissions placed for construction consultancy services and they assist in the selection of technical consultancy firms in conjunction with host governments. (62)

International Aid and Related Organisations

There are a wide number of international agencies. The major ones are the World Bank, (including IBRD, IDA and IFC) and the United Nations (including WHO, UNIDO etc.). Other aid bodies or banks are mostly regionally located such as Asian and African Development Banks: alternatively some like the Kuwaiti and Saudi banks are country based.

**TOP INTERNATIONAL CONSULTING FIRMS
DEVELOPING COUNTRY MARKETS**

	1982		1985		1988	
	VALUE	SHARE	VALUE	SHARE	VALUE	SHARE
	\$M	%	\$M	%	\$M	%
ASIA	733	22	919	29	1150	37
AFRICA	880	27	792	25	824	27
MIDDLE EAST	1266	39	974	31	809	26
LATIN AMERICA	381	12	455	15	322	10
	3260	100	3140	100	3105	100

Source : ENR (83,86,89)

TABLE 1-6

Information on these projects can pass to consulting engineers through such channels as the nations' commercial attaches or more likely from the banks and agencies themselves via their regular publications summaries and bulletins. The earlier stages of project information are also available from aid or bank sources direct. Consultants interested in aid projects are able to register centrally on DACON (Data on Consultants) without having to fill in the same information repeatedly for different agencies. The European Development Fund (EDF) allocates money to certain African, Caribbean and Pacific (ACP) countries and to some others in Asia & Latin America. Registration is necessary at some headquarters, such as the EDF, whereupon official information is circulated. Most agencies expect to be approached by interested parties as and when project work is backed by these agencies. (63,64)

In addition to regional areas' own funding agencies, one of the major funding sources of construction projects is the World Bank. Up to 40 % of the World Bank's projects was spent on construction in the early eighties. (65,66) While this might seem a generous prospect, Dickerson has pointed out that even the most successful developed country consultant would normally secure only 10 - 15 % of their work from World Bank financed projects. This means that many other sources have to be investigated by the individual consulting firm, although the domestic market may provide around half of all their work. (67) The total lending of the World Bank in 1985 was \$14,500 million: its aid budget was far greater than that, say, of the Asian Development Bank: in the sector of transportation alone, for example, figures were \$ 1800 million and \$ 220 million respectively. (68,69)

Aid from the World Bank has been distributed to a wide variety of geographical areas. The kinds of sectors which have been supported are: agriculture & rural development; energy, industry, other activities such as health, telecommunications, transportation and water supply & sewerage. Of these agricultural development, energy and water have all been consistently supported over the seventies and eighties. (70)

One organisation which brings influence to bear upon the international aid agencies is FIDIC (Federation Internationale des Ingenieurs-Conseils). This is an

international association which helps its consulting members to be in touch with worldwide developments and it is also a useful source of information on the international consulting sector. In the five year period up to 1984, between a third and a half of FIDIC's membership came from developing countries. (71,72,73)

Having discussed the major players and related organisations in international consulting, it is appropriate to examine the manner in which these firms have internationalised their business through various stages and organisational routes. In the construction consulting services sector, it is important to remember that parts of the service may need to be provided at the point where it can be delivered to the client most effectively. Since there is a need to supply some of the consulting service in the market, this has a bearing on the nature and forms of internationalisation that pervade the industry.

1.7 INTERNATIONALISATION IN THE CONSULTING SECTOR

Overview of Internationalisation

Firms begin to engage in international work by first developing their contacts through informal networks of relationships with other parties in the industry. Consulting firms who are not able or willing to work abroad on their own are likely to join together in consortia or link up in semi-permanent associations. Piggy-backing may be an alternative with larger organisations who already have experience of overseas projects.

Alternatively a firm may elect to conduct overseas work on its own or establish links in the host country through an overseas agent in the first instance. It may then see fit to develop a partnership in a joint venture with a local consultant. This could be an ad-hoc arrangement for the occasion or a more formal sharing of equity over the medium term. Alternatively a firm would endeavour to establish its own wholly owned subsidiary if the circumstances in the host country were favourable. This progression is indicated in Figure 1-5.

Foreign direct investment (FDI) would be deemed to occur when a firm had a separate productive design operation in the host country, from which it could also

SIMPLE MODEL OF INTERNATIONALISATION OF CONSULTING FIRM

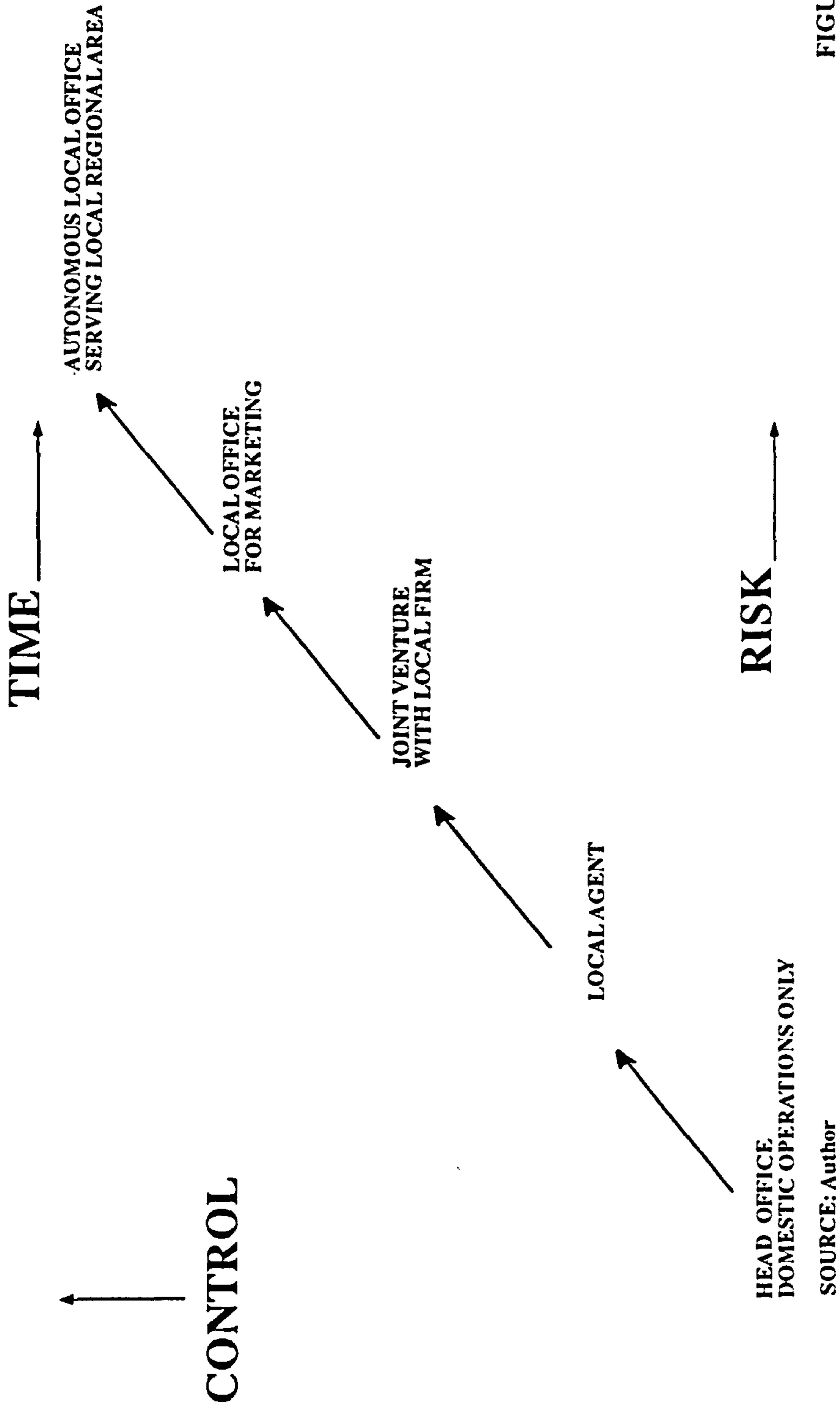


FIGURE 1.5

carry out marketing and information scanning. In such a situation the firm would be investing in the productive phase of the consulting process overseas rather than in its own home offices and this would involve a full subsidiary office. There are various other forms of organisational arrangements, in which consulting firms are active when carrying out international projects. Licensing and franchising are touched upon but they are not to be found very often in consulting. Package deals, turnkey, build-own-operate-transfer ("boot") and management contracts are all used invariably in response to a client's perceived requirements in this respect. However, joint ventures are a more common route for consulting firms to adopt. In the discussion which follows each of these options is described.

Networks

Many consulting firms from different parts of the construction sector have come to cooperate and interrelate with each other in networks in order to conduct their business at home and overseas. This contact network embraces the clients, subconsultants, contractors, suppliers and equipment producers who were discussed earlier in the chapter. Each of these can provide a certain amount of information on projects. Such contact between the parties can occur effectively at both a company and a personal level.

The network arrangement works on the basis that each firm is dependent on resources controlled by other firms, access being gained to them through their position in the network. Each firm would expect to interact with other parties and any common orientation would manifest itself in a "common language regarding technical matters, contracting rules, and standardisation of processes, products and routines". (74)

In order to get into new markets, a firm has to build relationships which are new to itself and its counterparts. Initiatives have to be taken by both the client and the firm itself with old relationships being set aside in order for new ones to flourish. Sometimes a firm becomes involved in a network because the client has taken the initiative first. (75)

Most consultancies are reluctant to turn away work in case it might give a competitor a chance to enter a close-knit and sometimes longstanding relationship.

Marketing in the formal sense is probably displaced by this kind of buyer-seller relationship between client and consultant. (76) This concept helps to explain why formal marketing departments do not always manifest themselves in various kinds of consulting firms.

Firms cooperate with each other in order to develop their position in the network or to work their way into it. Sometimes informal cooperation only is sought because a firm might not wish to take on too much competition. (77) Alternatively it might prefer to be a runner-up or it might be happy to be relatively invisible. Firms with strong positions are more likely to seek formal cooperation. (78) Johanson & Sharma noted that as consultants from different firms work together on a project they get to know each other's capabilities: trust develops and the relationship between firms keeps "developing and gradually becoming stable". (79)

While networks offer firms the opportunity to cooperate with each other, at both the early and later stages of internationalisation, sometimes smaller firms, due to certain problems they have, find it convenient to form themselves into a consortia in the first instance.

Piggy-backing and Sub-contracting

Piggy-backing seems to be another good solution for the small firm. Here firms join together voluntarily and the relationship is "closer than arms length but short of a formal joint venture or merger". (80) However large firms are sometimes "reluctant to deal with small entities who are quite likely to generate large nuisances and little return". Smaller firms may have to form into groups prior to seeking piggy-backing agreements: in doing so there are advantages in grouping by a family of product disciplines or geographical areas. (81) This implies that small firms may not be able to work on their own, in the first instance, even to benefit from piggy-backing. Piggy-backing also implies that subconsulting or subcontracting will occur as work is passed on to other firms in the industry.

Consortia

Gathering market information on developing countries is not necessarily very expensive but for the single small firm on its own it can be. General data about

country markets or information on various standards and regulations might be conveniently shared between groups of firms. The translation of English including technical English is an example of "a formidable headache for a small firm". (82)

For small consultancy firms with up to 50 employees, the costs of bidding on projects can be prohibitive, seeing they can only at best expect to win "one or two assignments for every 10 tenders". Small technical consultancy firms are unable to spend the huge sums of money involved on international bids. Distance from the market, lack of financial resources and the long time span needed to develop contacts and become well known all conspire to make working overseas more difficult. (83)


As a result some firms might seek to adopt a "consortium" approach. Several firms band together into groups and then take on overseas projects. The marketing and technical resources of the participating firms are pooled, independent offices are set up and the costs shared. One beneficial effect is that more countries can be covered this way. To be successful a consortium needs to be made up of firms that can provide complementary specialisms. One of these firms may need also to be dominant so that it can provide a clear authoritative lead to the others. (84) Even for dominant firms, the term consortia can also be used to describe an organisational arrangement where several leading firms band together to handle the extreme demands of a massive project.

Semi-Permanent Associations

Another version of the consortium is to form semi-permanent associations. In such arrangements "no constituent unit has the veto power and no firm can stop the others from participating in an assignment in the country". (85) Sometimes these liaisons extend to sharing a joint overseas office with a particular brief to be in touch with the financial institutions or aid agencies: an example of this is a shared person in Washington to contact the World Bank. (86)

Licensing, Franchising and Countertrading

Licensing, co-production agreements and franchising are not to be found much at all in the overall construction project process itself, although they do manifest



themselves in subparts of the industry in the guise of various kinds of construction techniques. These may be operated by suppliers who are likely to be involved in the manufacturing of plant and equipment. It can be observed here that there is a much higher proportion of physical rather than human capital.

Countertrading, where an exchange of goods occurs instead of payment, are also rarely found if at all in consulting, although in contracting, land or raw materials may, at times, be exchanged for services. One reason that consulting firms are not involved in licensing is that the expertise to carry out design and feasibility is very much tied up with the personal and professional qualities of the senior staff that the firm employs. If this service were to be licensed, it would be very difficult to assure a client that an adequate service was always fully available. Secondly, to assign this work to others might be likely to lead to the firm being sued at a later date for errors occurring when a project was brought to fruition at the subsequent stages of construction and operation. The consequential effects of this, in financial terms, would be more far reaching than the fee that the consulting firm had charged, since this fee is usually only a proportion (around 5 %) of the overall project cost. Franchising can occur in certain parts of the construction process, (for instance in particular types of concreting, using novel methods) but here again, like licensing, franchising does not impinge on the overall consulting operation.

Package Deals

Consultants usually have established themselves with particular reputations in certain areas of expertise but many consultants have come to offer a much wider range than they have originally been known for. (87) For instance some consulting engineering firms have taken onto their staff economists, biologists, electrical/mechanical people, architects and allied disciplines which enable them to give a comprehensive service because "many clients particularly like to have an in-house capability for all skills that are required" (88)

In the last two decades, it has become more and more common to witness package deals or all-in contracts taking place in the construction sector. Here consulting engineers cooperate with contractors to provide a united offering to the client. The firm providing the overall lead sometimes puts up a part of the front-end cost with

one organisation providing feasibility and design services and another effecting construction. While consultants and contractors appear to carry out very different roles, Abbott has noted that the distinction between them can become blurred in these circumstances. (89)

Francis, in tracking various recent trends, has pointed out that "frequently there are opportunities to negotiate project business on a package deal basis involving finance, design, construction and commissioning" as well as training involving technology transfer. (90) Where a package bid is mounted there is no guarantee that any of the bids will be accepted and the firm acting in the lead may be asked to bid later on the basis of another's submitted design. This can seem a very wasteful process in view of the difficulty of organising any kind of copyright. Package deals can be seen actually to be increasing costs to the client in the long run. However, there are advantages in appointing one project manager who deals with the client on behalf of the consulting engineer/contractor combined, although some concern has been expressed from the client side at the added costs, bureaucracy and communication difficulties. Altogether, these arrangements tend to be associated most with large multi-disciplinary projects or those specialist projects usually found in the oil or chemical industries.

Turnkey Contracts

A further nomenclature used to describe a kind of all-in contract is the turnkey contract. There is a slight difference here in that the client has to do the very minimum, in fact only turn the key when the project is ready for handing over. The firm undertaking a turn-key contract would carry out the "full range of technical and managerial operations needed to establish an enterprise"... and then would "turn over the management of the enterprise in full operating conditions to the local owners as soon as they are prepared to assume responsibility". Construction of the facility, such as a factory or a dam, would be undertaken by the firm with training and transfer of technology sometimes being provided for people in the local recipient firm. (91)

Management Contracts

Management contracts provide another variation for contract organisation (92); these may be defined as "arrangements under which operational control of an enterprise ... is vested by contract in a separate enterprise which performs the necessary management function for a fee". (93) At various times, the consulting firm may provide a management service for certain parts of the total process, one common example being the provision of senior managers to oversee the site supervision stage.

An alternative version of the management contract for the consulting firm is the provision of full project management services for a client. This often occurs where the client does not have enough in-house strength to manage a project by itself. The consulting firm in such a case would not necessarily be involved in the detailed design but would oversee the work of other firms on behalf of the client at all stages of a project.

"Boot" Projects

These projects are an acronym for Build-Own-Operate-Transfer. Here the incoming firm offers to share in the equity with the client and agrees to design and build the project as in a package deal and then operate it. (94) This is particularly suitable when a new power or water system is being introduced which needs a steady process of adoption in the local community. Because of the requirement for equity involvement, the "boot" approach has not been as popular with consulting firms as it has with some of the very larger international contractors.

Joint Ventures

It has already been shown that considerable investment on infrastructure has been going on for some years in many developing countries. Even given some of the problems experienced by some local consulting firms, many host government countries have tried to encourage the formation of joint ventures so that they could be less dependent on foreign firms. In response Western firms have been prepared to accept local consultancy firms as partners mainly to gain access to local decision makers. Increased competition had also led to a greater emphasis on lower prices,

leading to local staff sourcing for some of the more routine tasks. (95) Cooperation has taken place occasionally at the feasibility stage but more often at the detailed design phase, once it has reached the stage of clear definition. This means that when and if a local firm can be relied upon to fulfil this function, a measure of work can be done locally.

From a construction contracting viewpoint, Cantwell & Dunning have noted that less developed countries with a small population, a low GNP per capita and an unexpansive land area are unlikely to attract more than a short term commitment from incoming firms. They observed that a local branch affiliate (or subsidiary) would not necessarily be established because the firm could operate satisfactorily through contractual arrangements in the local situation and still maintain the managerial control it needed for the time it was involved on a project. (96)

The process of linking-up with local entities in slightly larger countries when incoming consultants arrive in a country seems to be a fully acceptable way of conducting business. However when there are large numbers of international firms competing, the quality of the local firms with whom each incoming firm agrees to collaborate can be far from uniform (97); some are local firms in their own right and others are more "opportunistic agents; or front-men", who can bring influence to bear in the right places of government. (98)

In the Philippines, the government has required the "utilisation of local consultants up to the maximum permissible mix; for transfer of technology purposes"; most of the time this has led to ad-hoc joint ventures. (99) It would be true to say that many clients in different countries have misgivings over joint ventures and prefer to deal with a single entity: "they can then lay the door of blame at one identifiable party" which becomes less complicated from an administrative and legal viewpoint. (100) In this sense the all-in contract has much more in its favour.

In other parts of Asia, Sharma notes that various different policies regarding joint ventures have been followed. (101,102) According to Eldridge it is becoming less common in the world generally for a consulting engineer to establish a (full) subsidiary in a developing country, although many of them still seek to maintain a substantial number of offices worldwide. Often local firms are already established

to some extent and the vehicle they seek for "the transfer of know-how may be via a joint venture in one form or another". (103)

While the incoming firm sometimes adopts joint ventures because they feel they will be more favourably placed with clients, more often they are entered into in response to the client's own insistence, (i.e. as a second best alternative). (104) Dickerson considered that by the mid eighties in most developing countries the days of mandatory joint ventures were over and that "few foreign firms would operate in a developing country without a voluntary association with a local firm". Such a voluntary joint venture brought with it "the motivation to put time and effort into developing a practical business relationship and trust to make it work". (105) Although the World Bank has encouraged joint ventures between developed and developing consulting firms, they have been very much against "forced marriages". (106) In the Bank's view, the firm acting in the lead "should be able to do the job virtually by itself, and should possess not only managerial ability but most of the technical ability". (107) Token leadership at the top of a joint venture purely for idealistic or nationalistic aims is unlikely to yield more than patchy results.

In discussing global strategy Porter has noted the role of "coalitions" in this process. By this he meant "a whole variety of arrangements that include joint ventures and many other kinds of inter-firm relationships". (108) Choosing and managing coalitions has been considered by Porter to be among the more interesting questions of international strategy from the mid-eighties onwards. (109) Although there are many reports of disaster indicating that success is not easily attained yet they continue to proliferate. He also considered that "there is a great need for research into coalitions at the level of both the academic community and the corporate world" in view of the fact that they are "increasingly being forced on firms by new competitive circumstances". (110) In Chapter 7, this aspect of joint venture coalitions is addressed in so far as they impinge on consulting firms involvement on technology transfer projects internationally. Before doing so however it is necessary to move closer to the main theme by examining some of the objectives for technology transfer which developing countries have set themselves in the recent past.

1.8 TECHNOLOGY TRANSFER

Some Long-term Objectives for Less Developed Countries (LDCs)

In 1975 the United Nations Industrial Development Organisation (UNIDO) set as a goal "that 25 % of the world's industrial production should emanate from Less Developed Countries (LDCs) by the year 2000" . (111) The bargaining power of these countries was to be increased along with the transfer of technology to them. Many of the objectives of the Third World were identified and some of these appeared in a Commonwealth Report on technological development, where Mordell explained further some of the drive for technology transfer. (112) He laid stress on the large number of engineers who were continually required in the developing world just to keep up with the expectations of development and population growth. Part of the problem has been compounded by the high numbers of engineers leaving engineering altogether at or before mid-career level.

Throughout these years, most developing countries have pursued active policies of industrialisation while legislation was being introduced in a number of countries for control the direction of foreign capital and technology. (113) However there were barriers to this such as lack of risk capital, lack of entrepreneurial talent and lack of technological know-how. Also there were problems of overpopulation and surplus labour, which could all contribute to an undermining of the best laid economic plans. (114) At the same time some of UNIDO's objectives were being frustrated by distribution problems in the host country due to lack of infrastructure, energy deficiencies and balance of payment & debt service problems. (115)

At the end of the seventies, Wallender foresaw further moves in the eighties which would require "local participation with foreign enterprises, greater diffusion of foreign technology and increased internal self-help capability for science and technology". International firms who could bring themselves to understand how to relate their technology to the perceived needs of host governments would achieve not inconsiderable success and continuity for their operations. Such firms would go in for thorough "technology audits" which would ensure that their own technology was being adequately communicated to clients in a relevant fashion. (116)

To the incoming international firm, developing countries have displayed a number of attractive characteristics: some of the benefits sought from incoming investors are shown in Table 1-7. (117) Sometimes governments have sought to unbundle the technology package being offered to them in an effort to remove inappropriate or too costly elements and also to allow them to compare one competitor's package offer with another. (118) Stoeber questioned how much a developing country could change its policies on technology transfer without driving investing firms away. (119) A developing country had to get the balance right: on the one hand it could try to extract too much from the investing firm who might then go elsewhere or it could offer too much in the way of incentives and find it had paid too high a price for the exchange. For the consulting firm too, it is just as necessary to strike a correct balance in the way they conduct themselves in new forms of their business such as technology transfer, examined in later Chapters 7 and 8.

1.9 IMPLICATIONS FOR CONSTRUCTION CONSULTING

As has been shown, most consulting firms begin by seeking information on an overseas project by trying to contact the client or financial sponsor. The first priority is to obtain a commission for a project: this may lead to the establishment of a presence abroad in the country concerned. A further alternative may be to obtain a subconsultancy from another firm. Networks of relationships around the world are important and it is useful for a consulting firm to develop as many contacts as possible. Firms may consider consortia with others and joint venture arrangements with local firms in the host country.

The term exporting can be seen as the taking of the consulting service overseas which then leads to work being brought back to the home office to be despatched, or exported, in the form of a design. After a while it has usually been easier to maintain this process by opening up a subsidiary office in the region or country since work becomes more assured this way. When this happens there can be a partial move towards a fully established subsidiary, or foreign direct investment (FDI) but the actual physical design may still be done in the home office so there can remain a mixture of exporting and FDI. This has relevance for the economic theory literature discussed in Chapter 3.

BENEFITS SOUGHT BY DEVELOPING COUNTRIES FROM FOREIGN INVESTORS

Technology transfer and technological training (a very important motivator for seeking foreign investment);

The upgrading of technology in investments already in place:

An increase in the local productive capacity and industrial base:

Industrial diversification:

Increased local value added, i.e., more inputs locally produced:

Opportunities for local suppliers and contractors:

Local ownership (full or part) of invested facilities:

Investment in remote or primitive geographic regions:

Increased employment:

The training and advancement of host citizens:

Facilities to establish industries or produce products which the local economy is not yet able to provide (often to substitute for imports);

Exports and foreign exchange earnings:

Government revenues.

Source : Stoever (85)

TABLE 1-7

While the predominant mechanism seems to be to open locally established subsidiaries, the costs of these operations may push some firms, particularly those not large in size, to use their associations with others in the network to share facilities in an effort to cut down their high front-end costs.

On overseas projects, joint ventures can be used for a number of reasons, already discussed, (such as to reduce risk, gain better access to the client etc.). Of particular interest to clients is the actual transfer of knowledge to local firms or indigenous personnel in client organisations. Here there may be active encouragement from the aid bodies in the first place who can see this as part of their overseas policy of development.

Different types of firm will want to see their activity overseas emerging in different ways. For instance, there are growing developments for firms who can carry out projects which assume that funds will be made available by the lead firm. Consulting engineers in these situations are driven to either cooperate with contractors (who have more of a financial base) or to begin to arrange finance themselves thereby taking on more equity risk. Because of the need for cooperation outwith the sector, the activities of other sides of the construction industry cannot be ignored (i.e. contractors and the other professional groups already referred to earlier). They are included therefore in the empirical evidence presented in Chapter 5 and two of the case studies in Chapter 7 also cover this part of the construction services sector. Sometimes clients want a type of management contract where key personnel are provided for a short period to design and organise a project for them or they require a full turnkey project which involves seeing to the whole operation. The extent that consulting firms have taken on such complete exposure has not been very great, although they do however become involved with the turnkey contractors in carrying substantial proportions of the work.

Technology transfer for British consulting firms has been a partial requirement on construction projects for some years. This seems to take place in a consulting firm's overseas branch or subsidiary office, in the home country or elsewhere. Firms have different policies and seem to derive varied benefits from their involvement with such. Throughout the stages of internationalisation, therefore various inputs for technology transfer appear to be sought from consulting firms,

as has already been partly indicated. In the knowledge that the construction sector is weak in many developing countries, and even more so for the local consulting sector, this suggests several possibilities for wider involvement of consulting firms in technology transfer activity. This theme is developed further in Chapters 4 and 7.

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- 2 HILLEBRANDT (84): p 1
- 3 ORSAAH (84): p 131-133
- 4 WELLS (86): p 12
- 5 NEO (76)
- 6 SEYMOUR (86)
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- 8 SAPIR (86): p 605
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- 13 SCHMENNER (86): p 22
- 14 HILLEBRANDT (84): p 2,3,99
- 15 FIGURE 1-1: HOOD, MANSFIELD, STANBURY & YOUNG (84): p 9
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CHAPTER 2 THE BRITISH INTERNATIONAL CONSTRUCTION CONSULTING SERVICES SECTOR

2.0 SUMMARY OF CHAPTER 2

- 1. Professional organisations in the British construction sector are organised differently from those in other countries. The international interests of the UK consulting sector are represented by the BCB and ACE.**
- 2. Proven strength in the domestic market is often a prerequisite for subsequent success overseas. Construction in the UK has seen a more buoyant period from 1986 onwards.**
- 3. Invisible earnings for professional firms in the British sector have been well represented by consulting engineering; in the mid eighties, this amounted to over £500 million.**
- 4. British consulting firms took 14 % of the total developing world market, the main regions being Asia, Middle East and Africa. The top 100 British consulting firms derived half their business from overseas projects; eleven of these were in the top 50 world consulting firms in 1987 but, for British contractors, only five firms were represented in an equivalent listing.**
- 5. British aid is allocated to international agencies, who expect to be approached by interested firms. Britain continues to spend around 0.32 % of GNP on aid through official development assistance. The proportion of bilateral to multilateral aid is about half that of other European competitors. ATP has been introduced in response to competitors' terms for soft loan funding. Bilateral aid is mainly distributed through the ODA, who cooperate with a variety of countries taking into account their own governments' priority development plans.**
- 6. Many projects in the seventies were funded by OPEC oil money. Around the same time, in-house public sector design organisations expanded at home and domestic demand dropped, leading many firms to take on overseas projects. Internal changes continue to occur within the professions; there have also been some external pressures upon consultants from fee competition at home which may threaten the quality of the service they offer abroad. Certain firms can be seen to be merging themselves into larger entities.**

7. Larger firms with a wide range of services or smaller medium sized firms with flexibility could both benefit in developing country markets. Networks of offices, experience of consortia and finance may also be contributing factors. Consulting firms who can offer a full service-related package attracting suitable aid funding are likely to be well placed in markets of the developing world.

Many facets of international construction, covered already, are reflected in the British sector. In this "British" chapter, which follows the same order as Chapter 1, the intention is to emphasise some of the particular idiosyncratic features from home and overseas which have influenced, and are influencing, the international activity of the British construction consulting sector.

2.1 PARTIES RELATED TO THE BRITISH CONSTRUCTION CONSULTING SECTOR

British Professional and Consulting Related Organisations

In Britain there are a number of professional organisations in the construction services sector. Consulting engineering firms are usually represented by civil engineers, which is the largest profession making up a third of all construction professionals. (1) On the civil engineering side of the construction industry, an international client would normally deal with consulting engineering firms who would have a high proportion of qualified civil engineers on their staff. On the building side of the industry, a client would also obtain services from architects as well as surveyors; the latter are a more distinct profession in the UK than they are in either the USA or Europe. In their international efforts, consulting firms are supported notably by two umbrella organisations, the British Consultants Bureau and the Association of Consulting Engineers.

The British Consultants Bureau (BCB) provides facilities for consultants to meet incoming foreign delegations or to brief interested firms on the return of a British ambassador from abroad. Consulting firms subscribe to the Bureau, which can sometimes act as a catalyst for the formation of a consortia of firms when a mega-project might require the involvement of several consultants' skills. Published brochures assist enquiring clients from overseas to find a suitable consultant.

The Association of Consulting Engineers (ACE) is a parallel organisation consisting of domestic and international technical engineering consultants. It seeks to act as a link with prospective clients, who may approach them in the first instance for advice on a suitable British consulting firm for an international project. There are also close ties with FIDIC, the worldwide consulting engineering organisation, described in Chapter 1. Although the ACE tends to adopt a lower profile than the BCB and is more focused on the engineering side of consultancy, it does seek to keep up a certain amount of pressure on the British government to maintain healthy levels of construction work at home. It also represents the professional construction interests of consulting engineers, as well as architects and surveyors, on the British Invisible Exports Council (BIEC).

2.2 CHARACTERISTICS OF THE BRITISH CONSTRUCTION SERVICES SECTOR

Domestic Construction

Before a firm can effectively be considered for work overseas, it is necessary to build up strengths in its own domestic market. (2) Partly because of the intangible nature of consulting services, an overseas client may look for a proven reputation at home evidenced in the completion of a number of successful domestic projects. The trends in domestic construction can have a considerable bearing therefore on the international side of consulting firms' business.

Domestic construction's UK gross output increased significantly in the period 1982-86. By 1986, construction output had regained its 1974 high level in real terms and since that time it has enjoyed a more buoyant period which has kept many consulting firms busy on home projects. (3) Employment in construction in the UK has occupied about 5 to 6 % of GDP throughout the decade, which is not dissimilar to the figures already described in Chapter 1, for most other countries. It is noteworthy that UK per capita expenditure on domestic construction has been much less than other European competitors. In the mid eighties, it was one half that of France or Italy and only one third that of West Germany or Sweden. (4) This suggests that Britain might be at a competitive disadvantage in international markets because of its weaker construction home base.

2.3 INVISIBLE EARNINGS IN BRITISH CONSULTING SERVICE

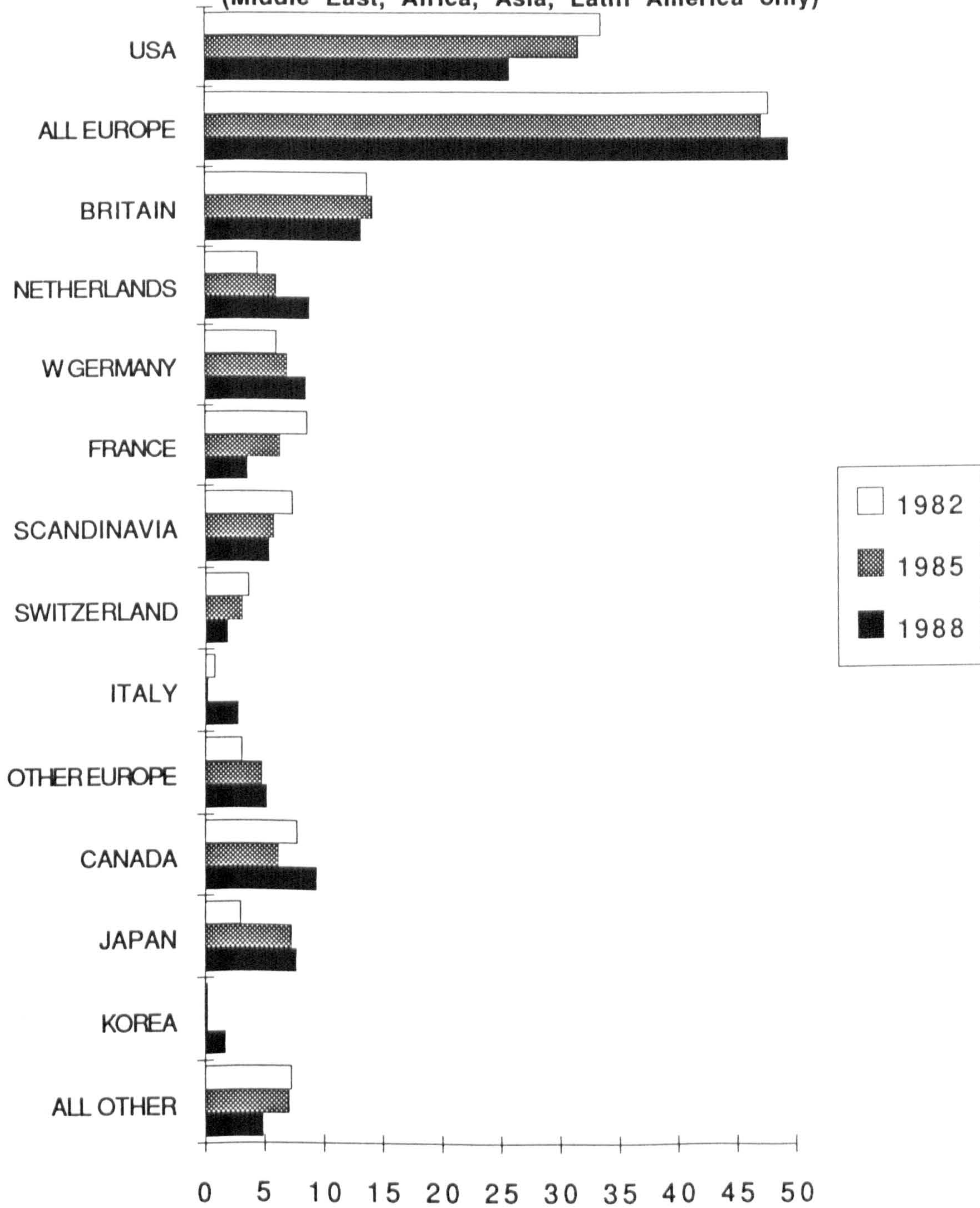
As was shown in Chapter 1, one indication of consulting firms' international activity is their record on invisible earnings. There are discernible differences between visible and invisible earnings. Visible exports can all be seen, handled or physically measured as they travel over a country's borders, while invisible exports are more elusive being derived from profits "received from foreigners in return for provision of services".⁽⁵⁾ A variety of sectors figure prominently in Britain's invisible earnings such as financial institutions, tourism, aviation and shipping (see Table 2-1).⁽⁶⁾ Under the heading of consultancy, consulting engineers are the major earners, ahead of lawyers, advertising and economic consultants. In value terms consulting engineers' 1985 invisible earnings peaked at £562 million but by 1989 this stood at £425 million in the face of fairly stagnant world market conditions. Within the construction industry itself, consulting engineers' share of all professional services invisible earnings was between half and two thirds in this period. A further measure is the value of capital works in hand from year to year, (compiled by the ACE). Although this is not actual earnings, it is the cumulative value of all projects being designed and managed by British consulting engineers at any one time. This reached a peak at £50 thousand million in 1985, although by 1989 it was down in line with invisible earnings to £33 thousand million (see Table 2-2). ⁽⁷⁾

2.4 COMPETITION AND PLAYERS IN BRITISH CONSULTING SERVICES

The World Market

In total terms, the developing world market share of British consultants hovered around 13 % to 15 % between 1982 and 1988. It can be seen that like invisible earnings, Britain has the second largest consulting engineering grouping in the world after the USA, in terms of international commissions received in developing country markets. Other major competitors were West Germany, France, Holland, Italy, Scandinavia and Canada but none of them succeeded in capturing more than 10 % of the total developing world market (see Figure 2-1, Table 2-3) ⁽⁸⁾⁽⁹⁾⁽¹⁰⁾ although Canada was close to Britain if all world markets are considered, including North America. In size terms in 1989, Britain had \$415 million in international commissions in developing country markets, compared to \$822 million for the USA; other leading countries had less than \$300 million each.

**TOP INTERNATIONAL CONSULTING FIRMS SHARE OF
DEVELOPING COUNTRY MARKETS
(Middle East, Africa, Asia, Latin America only)**



Source : Author's analysis of ENR (83), (86) (89)

FIGURE 2-1

SOME BRITISH INVISIBLE EARNERS

	Net earnings (£ millions)		
	1982	1985	1988
NON-CONSULTANCY			
Financial institutions (net)	3953	6645	7350
Tourism	3188	5442	6085
Shipping	3267	3271	3551
Civil Aviation	2471	3078	3192
Telecommunications and postal services	335	627	692
Expenditure by Overseas Students	449	566	783
Films and Television	172	338	354
Land Transport - Freight	95	129	264
Advertising	55	77	128
CONSULTANCY			
Consulting Engineers	565	562	400
Process Engineers	301	282	185
Solicitors & Barristers	80	155	300
Chartered Surveyors	73	99	100
Others including Architects	104	112	134
Management & Economic Consultants	44	53	66
TOTAL (Consultancy only)	1167	1263	1185

Source : CSO (89)

TABLE 2-1

**BRITISH CONSULTING ENGINEERING FIRMS
INVISIBLE EARNINGS AND CAPITAL WORKS ON HAND**

YEAR	INVISIBLE EARNINGS (£ MILLION)	CAPITAL WORKS ON HAND (£ MILLION)
1982	565	53,000
1983	561	48,800
1984	577	49,500
1985	562	51,300
1986	508	39,000
1987	418	31,400
1988	400	32,800
1989	425	34,000

Source : CSO (89); ACE (82-89)

TABLE 2-2

**TOP INTERNATIONAL CONSULTING FIRMS SHARE OF DEVELOPING
COUNTRY MARKETS (FOREIGN EARNINGS)
(MIDDLE EAST, AFRICA, ASIA, LATIN AMERICA ONLY)**

	1982		1985		1988	
	VALUE	SHARE	VALUE	SHARE	VALUE	SHARE
	\$M	%	\$M	%	\$M	%
AMERICA	1091	33.4	993	31.6	821	26.4
ALL EUROPE	1585	48.6	1474	46.9	1546	49.7
BRITAIN	496	15.2	442	14.1	414	13.3
NETHERLANDS	152	4.7	191	6.1	279	9.0
W GERMANY	214	6.6	216	6.9	266	8.6
FRANCE	281	8.6	200	6.4	109	3.5
SCANDINAVIA	222	6.8	179	5.7	168	5.4
SWITZERLAND	98	3.0	95	3.0	59	1.9
ITALY	31	1.0	-	-	89	2.9
OTHER EUROPE	91	2.8	151	4.8	162	5.2
CANADA	195	6.0	194	6.2	295	9.5
JAPAN	112	3.4	224	7.1	240	7.7
KOREA	-	-	47	1.5	54	1.7
ALL OTHER	278	8.5	209	6.6	152	4.9
TOTAL	3261	100	3141	100	3108	100

Source : Author's Analysis of ENR (83) (86) (89)

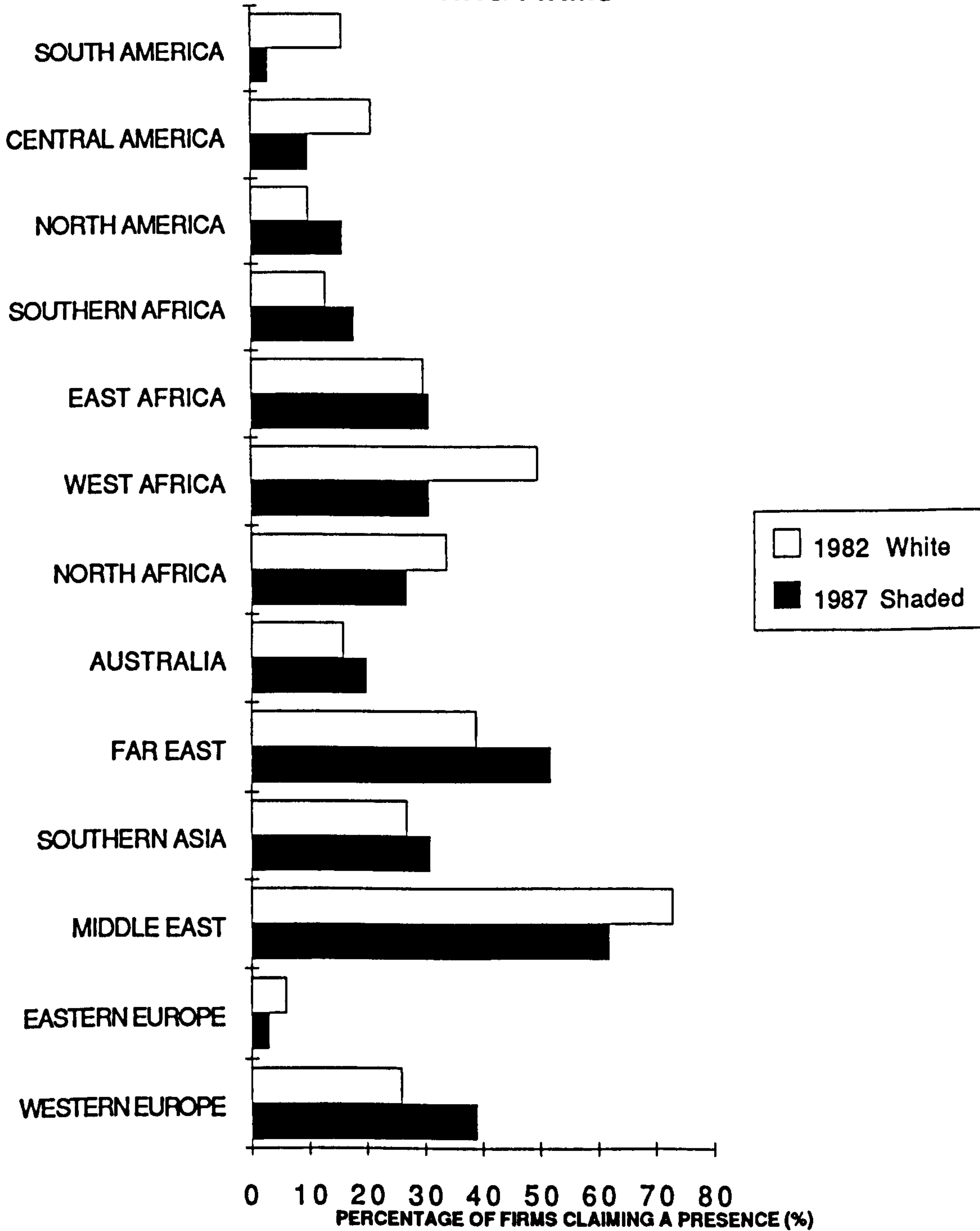
TABLE 2-3

Geographic Markets

As for the top 200 consulting firms in the world, there have been steady shifts in the focus of British international construction activity over the last decade. (11) In the Middle East, Britain (\$110 million) in 1988 has remained at second place throughout the eighties with around 15 % share of the market well behind the leader USA, which took about a third of it. Most other competitors at one time or another figured at less than half of the British figure. In Africa, Britain's market share was about 13 % (\$90 million) the strongest competition coming from Germany and the USA but each of these was closely followed by Canada, France and Holland. Throughout the African continent, no country has successfully dominated the situation and Britain has been able to maintain a consistent third placed position with a reasonably healthy stake in the market. In Asia, Britain (\$204 million) has held onto its second place with 18 % of the market in 1988, not far behind the USA and just ahead of Japan. By contrast, there has traditionally been poor British representation (3 %) in Latin America (\$8 million) where the USA has more easily dominated the market, due to its geographical proximity. (12) It is clear that Asia has now displaced the Middle East as the top market for British firms. This is supported by further surveys of the industry, presented in Figure 2-2 (13) which show graphically the changes in presence claimed by British consulting firms in each of the world's main regional areas between 1982 and 1987.

Later work in Chapter 7 focuses on Africa and Asia, where there is considerable demand for British consultants' services in technology transfer projects. Figure 2-3 and Table 2-4 (14)(15)(16) show the proportion of British consultants work in four continental areas of operation. Of these in 1988, half of their work was in Asia and a quarter was in Africa. If comparisons are made with Figure 1-4, it can be seen that Britain has opted to work much more in Asia than the world's top consulting firms.

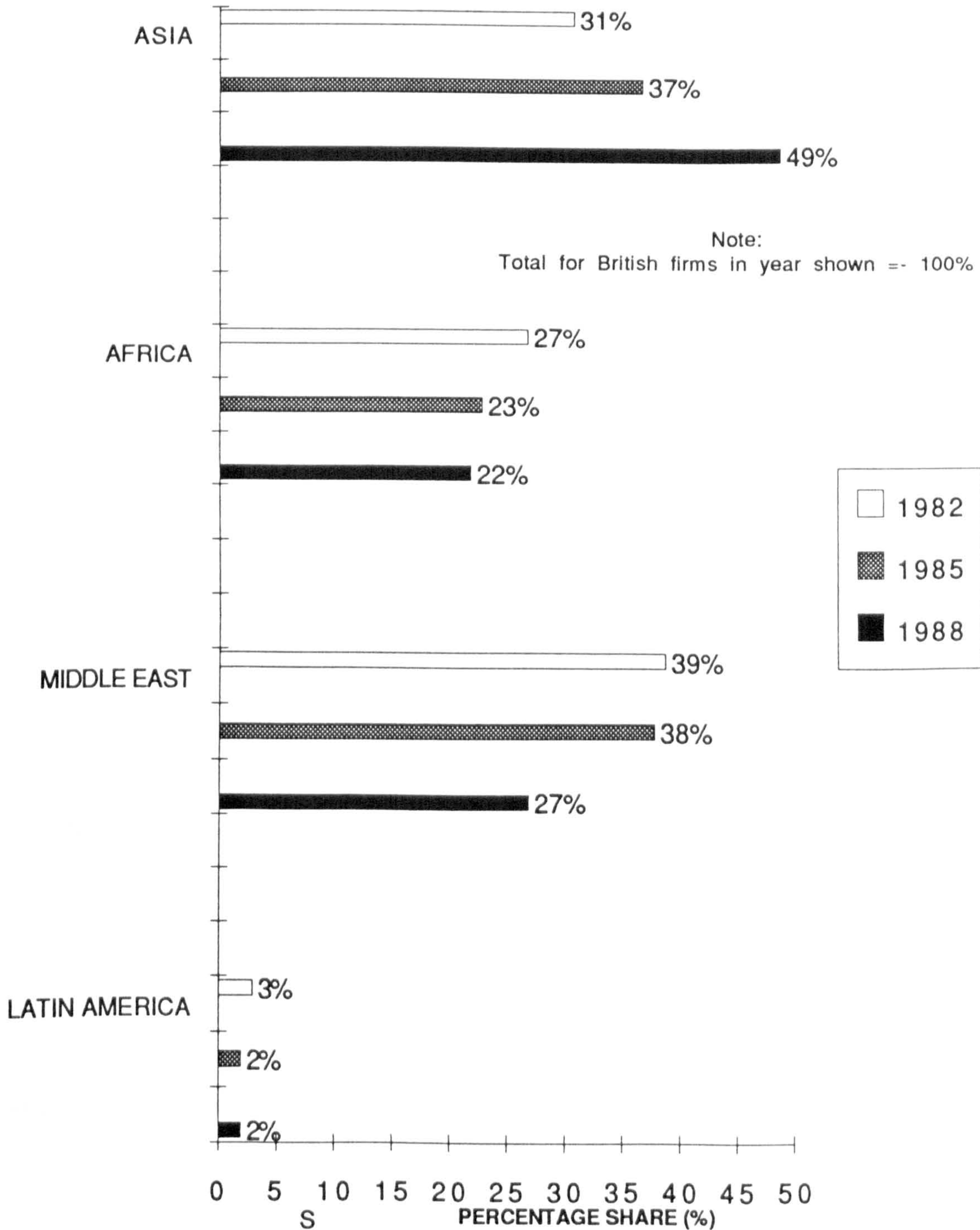
POPULARITY OF OVERSEAS MARKETS FOR BRITISH CONSULTING FIRMS



Source : Mansfield & Lafferty (89a)

FIGURE 2-2

BRITISH CONSULTING FIRMS GEOGRAPHICAL DISTRIBUTION OF DEVELOPING COUNTRY AREAS BY YEAR



Source : Author's analysis of ENR (83, 86, 89)

FIGURE 2-3

BRITISH CONSULTING FIRMS SHARE OF THEIR DEVELOPING COUNTRY MARKETS

	1982		1985		1988	
	VALUE	SHARE	VALUE	SHARE	VALUE	SHARE
	\$M	%	\$M	%	\$M	%
ASIA	154	31	161	37	205	49
AFRICA	135	27	100	23	90	22
MIDDLE EAST	194	39	170	38	111	27
LATIN AMERICA	13	3	11	2	8	2
BRITISH TOTAL	496	100	442	100	414	100

Source : Author's Analysis of ENR (83) (86) (89)

TABLE 2-4

British International Consulting Firms

To augment the picture of market share and volume, it is also worth looking at the sector from the point of view of some of the individual British firms involved. In the early eighties, Hillebrandt (84) (17) considered that British consulting engineers earned about three quarters of their fee income overseas, this being obtained by well over one hundred practices of consulting engineers who were active in all areas of the world. Close analysis of the annual New Civil Engineer (NCE) surveys (18) suggested that Hillebrandt's figure was on the high side. (19) The top 100 firms (with over 50 employed) had on average about half of their business overseas up until the mid eighties. Since then this proportion has reduced to a third or less.

Increased demand at home has allowed firms to grow much more on the back of a home based market than was possible several years earlier. For the top 25 firms, the overseas share was nearer two-thirds in 1984, with up to seven of the larger firms having as much as 85 % of their work abroad. (20) However by 1989 the overseas percentage of many of these top firms was nearer two thirds or a half. (21)

In the world's top consulting firms, (see Table 1-5) (22)(23) there were ten British firms, in the top fifty or so firms in 1983, compared to eleven firms in 1988. Ove Arup, one of Britain's largest consulting engineering firms slipped in this period from 7th to 19th place. Maunsells, Ewbank Preece, Acer and Scott, Wilson & Kirkpatrick (SWK) were between the 22nd to 34th position. In 1988, Mott Hay & Anderson and Sir Murdo MacDonald, merged into Mott MacDonald and moved up to 14th place.

Individual firms with the greatest British strength in the main geographic areas in 1987 were Maunsells, Mott Macdonald & Ove Arup in Asia, followed by Ewbank Preece & Acer in the Middle East and WLPU in Africa. (24) The placings of the top ten British consultants in 1989 are shown in Table 2-5; (25) of these Ove Arup had a total turnover of £121 million. Mott Macdonald came second with £76 million and the remaining eight firms were between £50 million and £30 million.

BRITISH CONSULTING FIRMS TOTAL FEE TURNOVER (1989)

		£ MILLION	
1	Ove Arup	121.4	
2	Mott MacDonald	76.0	
3	Building Design Partnership	50.0	
4	Maunsell	49.0	Note:
5	W S Atkins	46.0	
6	Sir William Halcrow	37.6	Golder Associates
7	ACER	35.8	(Canada & UK)
8	High Point Rendel	34.0	excluded
9	Sir Alexander Gibb	32.0	
10	Scott Wilson & Kirkpatrick	30.2	

Source : Consultants File (90)

TABLE 2-5

Because of the reliance of firms in the industry on networks of relationships to progress their activities, the fortunes of contractors (the other major party in the industry) are also of significance for consulting firms.

British International Contractors in Relation to Consulting

On overseas projects led by British consulting engineers, a variety of international contractors are to be found e.g. American, European (including Eastern European), and also a growing number of Asian companies from such countries as Japan and Indonesia.⁽²⁶⁾⁽²⁷⁾ In the space of less than a decade Korea's fortunes have waxed and waned as international contractors, much of their success being attributable to their ability to service the reducing Middle East market. ⁽²⁸⁾ A bone of contention with British contractors is that they are not especially favoured in the award of contracts, from British consultants, and have to compete on price with contractors from the rest of the world. Such evenhandedness is, conversely, cited as one further example of British consultants' reputation for integrity, which has appealed to clients over the years. ⁽²⁹⁾

While British consultants had eleven firms in the world's top 50 firms, British contractors by comparison had five firms only in the world's top 50 contractors in 1988. ⁽³⁰⁾ Like consultants, overseas construction activity on the part of UK contractors has also reduced in the period 1982-88, the "value of work done" being down by about a quarter. ⁽³¹⁾ This was in line with world surveys of top contractors, which showed that construction activity as a whole in this period had also reduced. ⁽³²⁾ Tarmac was the top British contractor in 1989 with a turnover of £ 3527 million, followed by Trafalgar House, Wimpey, AMEC, Beazer and Balfour Beatty, the latter having £1610 million. About 90 % of British contractors' international effort is carried forward by just ten contractors, which is in marked contrast to the wider spread of firms in British international consulting. ⁽³³⁾

One of the disturbing features of Britain's international contractors' activity is the tendency to withdraw from overseas markets in the short to medium term, once payment difficulties are encountered.⁽³⁴⁾⁽³⁵⁾⁽³⁶⁾ It can be argued that British consultants have occupied a more prominent place in the world vis a vis British

contractors and this may explain to some extent the low conversion rate of contracts let to British contractors by British consultants, which is further mentioned in chapter 5.

2.5 BRITISH AID SOURCES

British Aid

An overview was provided in the opening chapter of international aid which is important for all consulting firms worldwide. British consultants are similar to other international firms in the way they seek to tap into multilateral aid sources. All such firms who are interested in aid projects, have the opportunity to register centrally, whereupon official information can be circulated. Most agencies expect to be approached by interested parties as and when project work is in the offing. Information on projects can be passed through a country's embassies and thence to Government trade departments, or it can come from the Banks and Agencies themselves via their regular publications summaries and bulletins. The earliest stages of project information are best obtained from aid or bank sources direct, however. (37)

Bilateral British aid is disbursed via the Overseas Development Administration (ODA), in the main, with some being channelled through the Commonwealth Development Corporation or the British Council. With such aid in place, many consultant firms can benefit directly since project work is almost always placed with British firms (see Table 2-6). (38)

Official Development Assistance from Britain rose modestly between 1984 and 1988. As a percentage of GNP, Britain managed a figure of 0.32, which was not far off the DAC total average (0.35) for all countries. However, as was observed earlier, this is behind many other European countries, who have kept their allocations at a much higher level, as advocated by the international community (see Figure 1-2 (39) Table 1-4). (40) The British Minister of Overseas Development has partly defended this proportion by inferring that quality was more important than quantity and that the aid effort was being particularly directed at vital areas of development in selected countries. (41)

GROSS SUMMARY OF BRITISH AID (£ MILLION)

	1984	1986	1988
BILATERAL			
Project Aid (excl. ATP)	240	249	170
Aid & Trade Provision (ATP)	52	78	56
Programme Aid	37	56	124
Debt Relief	38	30	35
Other Non-project Aid	35	34	44
Commonwealth development Corporation (CDC Project Aid)	108	64	112
Total Financial Aid	510	511	541
Technical Cooperation(including British Council)	240	293	411
Administrative Costs	34	36	46
Total Bilateral	784	840	998
MULTILATERAL	226	223	274
European Community	197	154	229
World Bank Group	66	81	110
UN Agencies	29	36	29
Regional Development Banks	14	16	17
Other	531	510	659
Total Gross Expenditure	1316	1350	1658

Source : ODA (89)

TABLE 2-6

In the last decade or two, there has been a tendency worldwide for bilateral types of arrangement to increase. (42) Comparison of the ratio of bilateral to multilateral aid shows that individual country donors adopt markedly different policies. It can be observed in Table 2-7 (43) however that this ratio has been very much higher for some European countries than for Britain which gives their firms an advantage in terms of the lower costs experienced for bidding and marketing on international projects. Britain continues to adopt a freer policy of less tied aid distribution than competitor countries.

Nonetheless, positive moves have been made by the British government from the mid eighties through the instrument of Aid and Trade Provision (ATP) in response to competitors' use of soft loan funding; the term "soft loan" implies the mixing of highly concessional aid with semi-commercial export credits. This type of approach, as used effectively by Japan, in countries such as Indonesia, has come to be seen as essential to winning some of the largest foreign projects. (44) Aid and Trade Provision (ATP) forms a growing part of British bilateral aid.

When British firms win ATP orders abroad, there is a government to government aid agreement offered on the basis that there will be a procurement element coming back to the home country. This is usually to the greater benefit of Britain's capital goods manufacturers and suppliers, who receive further coverage in later Chapters 5 and 7.

Overseas Development Administration

As regards the Overseas Development Administration (ODA), funds are allocated from the central British government on an annual budget basis. In each of the major continents, the ODA has regional offices which administer funds and evaluate local needs. Aid is allocated to specific countries, whom the British Government feel is deserving of assistance. Former Commonwealth countries in Africa and South East Asia tend to benefit the most, although the needy areas of the World such as Mozambique also receive help. (45) Projects within these countries can then come to fruition based on the priority development plans of the host recipient government rather than those imposed by the aid donor. There are thus a number of decisions makers involved in giving a project the go-ahead which has implications for consulting firms in their search for work. The ODA compiles a register of

AID COMMITMENTS 1986 (US \$ billion)

	Bilateral Aid (a)	of which grants	Multilateral Aid (b)	Total	Ratio (a:b)
FRANCE	4.2	3.2	0.9	5.0	4:1
W GERMANY	3.3	2.0	1.4	4.8	3:1
JAPAN	4.3	1.8	1.8	6.2	2.1
UK	1.1	1.1	0.9	1.9	1:1
USA	8.8	7.7	2.0	10.8	4.1

Source : Holland (89)

TABLE 2-7

firms interested and able to work on projects at London headquarters but the decision on a suitable consultant for a project can be taken either in the regional offices or at headquarters. In the later cases of Chapter 7, there is a substantial representation of British aided projects.

2.6 BRITISH CONSULTING FIRMS: INFLUENCES ON INTERNATIONALISATION

The World Context

Through the fifties and sixties, British consulting firms, like their European counterparts, have had a ready outlet overseas in their former colonial territories. Many are Commonwealth countries who have been on the receiving end of aid. (46)(47) When oil prices quadrupled in the early seventies a flood of cash was released which was rapidly spent on infrastructure development. British consultants were quickly on hand providing the technical expertise to launch a range of new projects. (48) This goes some way to explaining why the Middle East was figuring so prominently in international construction before Asia took over as the leading market.

In the eighties, consulting firms, and other construction groups, have experienced a slowing down in overseas commissions. As has already been shown, in the opening chapter, this has been matched by a growing desire of developing countries to do what work they can themselves and to see their own nationals employed and trained on projects, (49)(50)(51) which has implications for the way that consultants carry out their work.

The Influence of the Home Base

Considerable changes have also been occurring in the domestic construction industry at home in the past two decades. During the seventies, UK clients' in-house design organisations gradually took on much of the public sector engineering project work, (e.g. motorways, government buildings etc.) which tended to reduce the domestic workload of international consulting firms. At the same time as competition on overseas projects was increasing, the home market for UK

construction, which has traditionally acted as a spring-board for advance overseas, was steadily being cut away, (at least until 1987 when there was a construction upturn). Paradoxically, this steady erosion of funding for capital projects in the UK drove many firms into the overseas market almost out of necessity. As a consequence not a few firms were forced to climb the overseas learning curve all too quickly. Usually, those firms who fared best were those who were already well established overseas. (52)

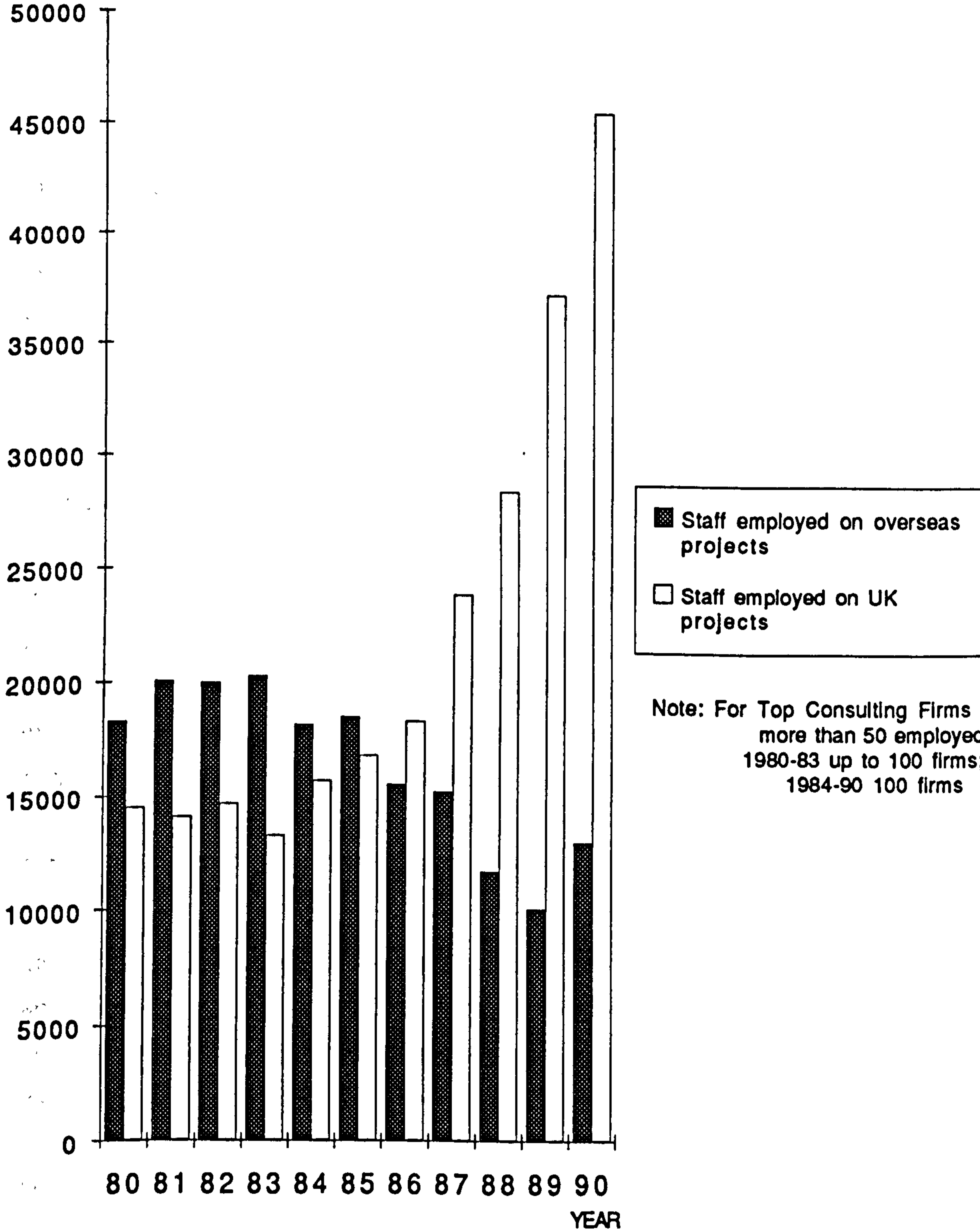
As the eighties have unfolded, there has been a clear swing away from public sector design teams handling a substantial part of construction work to one where private sector consulting firms are increasingly brought in to bid for projects, thus reversing the policies of the seventies. (53) With such increased demand at home in the late eighties, many international consultants have begun to concentrate on home projects on their own doorstep, (as already indicated earlier in this chapter) with the result that less attention may have been given to overseas markets. (54) This is certainly the picture conveyed by Figure 2-4 (55) for the numbers of staff employed. It remains to be seen whether this will have been a strategic home-base "strengthening" exercise or a conscious withdrawal from hard won overseas territory of earlier years. (56)

Further Competitive Pressures at Home

In the past decade, changes have also been occurring within the British professions themselves witnessed by greater freedom to advertise services and a movement of firms to limited liability status away from pure partnerships. (57)(58) The most significant change however has been in the area of fee competition, which was effectively introduced into the UK for consulting engineering firms by government clients in the mid-eighties. (59)(60) The basis on which fees had formerly been charged was based on a sliding scale, linked to the value of the contract being designed. (61) Under fee competition, price has become more of a factor in firm's selection. As a consequence, the low level of some firms' bids to obtain a commission, may well lead to an inevitable reduction in the quantity and quality of the service provided, which could have important repercussions on the long term reputation of British consulting in world markets. What is disturbing here is that many international client countries have specifically selected the services of British consulting firms for their independence (i.e. no tie into a client body or

STAFF LEVELS IN BRITISH CONSULTING FIRMS

Number of Staff



Note: For Top Consulting Firms with more than 50 employed 1980-83 up to 100 firms; 1984-90 100 firms

Source: NCE Consultants File (Annually)

FIGURE 2-4

contractor), integrity (professional fairness to all parties) and quality (expressed in both the depth and range of services). It is the latter which could be particularly undermined by fee competition at home. (62)

Regrouping of British Consulting Firms

Fewer British firms are to be found in the world's top ten or twenty firms than would be anticipated from Britain's already demonstrated position (as number two) in the world of international consulting. Recent merger activity on the part of some of the larger consultants is changing this pattern and it is possible that others will follow suit. (63) Overseas fee collection problems have forced one long established sizeable firm to merge with a newer firm with less technical expertise but more business flexibility in offering packages. (64)

Many other firms have also begun to merge in the industry from 1987 onwards, including some medium-sized, and even large, international consulting firms. (65)(66) The drive is towards larger units with a wider spread of disciplines and greater geographic presence both in the UK and abroad. Such regrouping has very probably occurred with European harmonisation on the horizon and with European competitors known to be much larger than many British firms. Larger firms are often the best placed to operate effectively in the markets of the developed countries although this may or may not be quite as true in the developing world.

2.7 IMPLICATIONS FOR BRITISH CONSTRUCTION CONSULTING

Leaving aside the USA, it has been shown that British consulting is half as strong again as any other competitor, in the overall developing world market and this position has been maintained throughout the last decade in all three regions of Asia, the Middle East and Africa.

However, it should be noted that low levels of domestic construction and poor allocations of bilateral aid both have the potential to undermine this position. With backing at home from such organisations as the BCB and the ACE, the traditional strengths of British consulting appear to be upheld abroad in the quality of the service offered, although this is not being assisted by a fee competitive situation at home.

It would appear that larger units of merged firms are beginning to come together partly in response to these pressures. It is possible that larger entities will provide a sounder basis for offering a fuller range of services including those of technology transfer expertise to developing country clients. However the flexibility of medium sized firms may also be an asset in such markets and they could find they are in just as good a position to joint venture with developing country firms as many of the larger enterprises.

Networks of relationships in the British context are likely to involve consultants with contractors, capital goods manufacturers and suppliers, as well as architects and surveyors. Added to these, are wider links with international organisations and firms in other industries, who each have well developed international networks of their own.

With consortia arrangements in mind, there are a larger number of small to medium sized consulting firms in Britain compared to say Scandinavia. Since the British domestic market is larger, this is more likely to afford smaller consultants the opportunity to grow in size through their own domestic projects. At the same time, by consorting together, they may also put themselves in a better position to compete overseas.

The spread of offices exhibited by many of the larger British consultants is considerable. They also seem to be ready to open new offices in areas of perceived demand such as Asia and to close them in reducing areas like the Middle East. How much these firms are finding their offices useful for market information gathering or for productive activity is a relatively open question, which is explored later. It may also be true that projects are clinched more effectively with host country clients if firms are able to display a wide network of offices.

A few of the larger consulting firms have been taking steps to equip themselves in order to become more involved in the financing of some projects. The privatisation experience gained in the eighties in British industry has assisted certain merchant banks to gain experience in such financial arrangements and there could be increased spin offs in international construction as a result. The extent of

consultants' actual involvement in project equity arrangements is addressed to some degree in later case studies.

While package deals, turnkey and "boot" projects would appear to provide new opportunities, consulting firms may not benefit that much from formal liaisons with British contractors, seeing that the latter are, on the whole, much less well represented in world markets.

Later chapters go on to explore how far British consulting firms can extend their business in developing world markets through new kinds of arrangements. This could lead firms to offer a more open-ended and in-depth service particularly in relation to technology transfer projects, many of which are funded through bilateral or multilateral aid packages.

In the substantial section which follows (Chapter 3), a review of theory is conducted in relation to the international construction sector, initially beginning with international business theory, encompassed within the economic theory area (including the eclectic theory) and thence leading on to the stages-of-development (internationalisation), strategic and professional services theory.

REFERENCE FOOTNOTES: CHAPTER 2

- 1 HMSO (76): p 25
- 2 SAPIR (86): p615
- 3 NEW BUILDER (90): p 11
- 4 STEVENSON (86): p 9
- 5 BIEC (79): p 7
- 6 CSO (89): p 27
- 7 ACE (82-89)
- 8 ENR (83): p 38
- 9 ENR (86): p 28
- 10 ENR (89): p 44
- 11 ENR (83-89)
- 12 ENR (89): p 44
- 13 MANSFIELD & LAFFERTY (89a): p 47
- 14 ENR (83): p 38
- 15 ENR (86): p 24
- 16 ENR (89): p 44
- 17 HILLEBRANDT (84): p 99-101
- 18 CONSULTANTS FILE (80-84)
- 19 MANSFIELD (86a): p 1213
- 20 MANSFIELD (85a): p 5-7
- 21 CONSULTANTS FILE (90)
- 22 ENR (83): p 38-40
- 23 ENR (89): p 47-50
- 24 ENR (88): p 34
- 25 CONSULTANTS FILE (90): p 68
- 26 HILLEBRANDT (84): p 95
- 27 O'NEIL (83)
- 28 McDERMOTT & YOUNG (89): p 70-81
- 29 MANSFIELD (85a): p 6
- 30 ENR (89a): p 57-61
- 31 BRITISH BUSINESS (88): p 20
- 32 ENR (89a): p 54
- 33 CONTRACTORS FILE (90)
- 34 TARMAC (82)
- 35 LAING (84)
- 36 NCE (87b)
- 37 MANSFIELD WHEELER & YOUNG (87): p 10-13
- 38 ODA (89): p 4
- 39 ODA (89): p 1
- 40 ODA (89): p 1, 2
- 41 MONTAGNON (87): p 9
- 42 PARISH (85): p 118
- 43 HOLLAND (89): p 11
- 44 FRANCIS (87): p 102
- 45 ODA (90): p 45-48
- 46 BIDGOOD (76): p 51-91
- 47 COHEN (82): p 75-103
- 48 PARISH (84): p 118
- 49 SHARMAN (81)
- 50 CONSULTING ENGINEER (84)
- 51 STARR (85): p 103-114
- 52 PARISH (85): p 118-122

- 53 MANSFIELD (89a): p 23
- 54 MANSFIELD & LAFFERTY (89b): p 35
- 55 CONSULTANTS FILE (80-90)
- 56 ROWDON & MANSFIELD (89b): p 221,222
- 57 BRASIER (86)
- 58 MIDDLEBOE (88): p 5
- 59 CIVIL ENGINEERING (87): p 17-19
- 60 MANSFIELD ROWDON & DUNN (88): p 34,35
- 61 ROWDON & MANSFIELD (88): p 91
- 62 ROWDON & MANSFIELD (89b): p 221,222
- 63 BYRD (88): p 6
- 64 MIDDLEBOE (87): p 24
- 65 CONSTRUCTION TODAY (87): p 10
- 66 NEW CIVIL ENGINEER (90a): p 11

CHAPTER 3 THEORETICAL REVIEW

3.0 SUMMARY OF CHAPTER 3

1. Various early and recent theories have given rise to the eclectic theory.
2. The eclectic theory predicts that a firm would require to have ownership, internalisation and locational advantages to engage successfully in FDI abroad.
3. The revised eclectic approach seems to embrace rather than modify many parallel strategy and policy theories.
4. All firms are ultimately service firms in some respects. The eclectic firm can be applied to services and construction service firms alike.
5. In construction consulting, firms have advantages in a particular expertise in conceptualisation of projects and design capabilities, which must be carried out safely and soundly in key aspects, usually within the firm. Information gleaned on technology transfer projects may be transmitted satisfactorily through a firm's network of subsidiary offices.
6. Internationalisation extends through exporting to wholly owned subsidiary offices and also through other arrangements.
7. The stages-of-development approach sees expansion into overseas markets as proceeding in stages or a series of small steps.
8. The stages-of-development approach is more behaviourally orientated, compared to the eclectic approach which emphasises rational objectives.
9. Firms can proceed overseas alone, go in a consortia or in a joint venture; in either case an agent in the host country would be used and in turn a joint venture with a local firm.
10. Joint ventures with other UK firms reduce exposure on large projects while those with local firms increase local influence. Developing country firms gain access to skills and sources of finance.
11. Management contracts can open up long term influences in client organisations through the managers and systems deployed.
12. Wholly-own subsidiary offices are at the end of a spread of international market entry methods and have been associated with firms' need to exercise local control.

13. In construction consulting, "domestic internationalisation" may lead to expansion abroad. UK firms mostly work alone but also in joint ventures with local firms. Management contracts could have similarities with technology transfer arrangements in consulting.
14. Competitive advantage for consulting firms was achieved through low cost or differentiation and would spring from the value a firm could create for its clients through the value chain.
15. Some smaller multinational firms were treated by host governments in the same manner as larger multinationals.
16. Professional consulting firms carried out "Brains", "Grey-Hairs" or "Procedural" projects and tended to be "Specialist", "Multi-specialist", "Product-orientated" or "Problem-solver" in type. They could also be seen as either "Business-centred" practices or "Practice centred" businesses.
17. Construction consulting firms should be able to differentiate their service through the supply of technology transfer services.

3.1 EARLY AND RECENT THEORIES

Background to International Activity

Over a period of time, separate strands have developed in the area of international economic theory.⁽¹⁾ According to Dunning the first was via trade theory and the second was via several theories related to production and ownership . These were reflected in classical and neo-classical theory as well as those of neo-factor and neo-technology trade . "International production was examined in the 50's - 60's from at least two unrelated angles. Industrial economic theory addressed itself to saying why firms operated overseas and location theory sought to explain the reason why it happened where it did".⁽²⁾ In the seventies the approach was extended on four main lines: namely industrial, financial, theory of the firm and the eclectic framework. ⁽³⁾ It was becoming evident that there was a growing convergence of the theories of international trade and production . In other words, it was inevitable that "attempts would be made to integrate these theories, particularly as it became clear that decisions to export or to manufacture abroad were often alternative options for the same firm". ⁽⁴⁾

Some of the more recent theories are now described; in doing so greater understanding is made possible of other ideas found in business strategy and engineering management disciplines, which appear in later sections.

Internalisation and Imperfect Competition

Buckley and Casson ⁽⁵⁾ argued that rigid ideas of profit maximisation and perfect competition both had to become more flexible in order to make room for goals of individual managers and patterns of oligopoly in some industries. They drew on the ideas of Coase ⁽³⁷⁾ who observed that the market could be both costly and inefficient for some firms and that they might choose rather to "internalise" transactions. Price mechanisms operating in the market became superseded when resources were moved around within the organisation; ⁽⁶⁾ multinational firms did this across international boundaries.

Calvet observed that these departures from competition provided a basis for foreign direct investment (FDI). (7) Hymer had suggested that, since local firms in the overseas market would be better informed about conditions in their own country, then incoming foreign firms must have some compensating advantage to overcome this situation and the competitive market must be less than perfect. (8) If a firm did decide to work abroad its ownership advantages needed to be much greater than those of local firms, given the costs of operating at a distance in strange territory. (9) Buckley also pointed out that some foreign locations might not carry much competition from either local or foreign firms; it was merely sufficient to "be there" to have a competitive edge. (10) It has already been shown in the first chapter that the consulting sector in many developing countries is relatively weak when compared to incoming competition from international firms.

There were five types of market imperfection which could make for effective internalisation according to Buckley & Casson, namely: time lags from the outset of product initiation to final marketing, discriminatory pricing, frictions in the bargaining process between large competitors, inequality between buyer and seller and, lastly, government intervention through tariff controls or capital transfer regulations. They further went on to delineate a number of other factors in the incentive to internalise, applying these to industry, region, nation and firm. Several theories that impacted on individual firms were highlighted in particular those from: Hymer-Kindleberger, Aliber, Vernon, Knickerbocker and Aharoni. (11)

Industrial Economic Theory: Hymer and Others

The Hymer-Kindleberger view in the school of industrial economic theory (and also market failure theory) concentrated on ownership advantages derived from brand name, special marketing skills, privileged access to proprietary technology, economies due to plant scale and vertical integration. Yet other advantages could be derived from a firm's position in a particular currency area (Aliber), the maturing nature of the product (Vernon) and the bunching of oligopolistic firms "following the leader" into markets (Knickerbocker) and finally the timing of firms' investment in response to stimuli both from within and without the firm (Aharoni).

The possession of managerial and entrepreneurial skill was important. If underutilised, this could have an influence on the activities of organisations. Other factors were the need for access to raw materials and intermediate goods and also to capital markets. Apart from advantages in the design and marketing of differentiated products, there was the inadvisability of transferring know-how by contract transactions from the home to the overseas market. (12)(13) It was observed that firms gained special experience in differentiating their products in the home market which then gave them an edge in their operations in other countries, provided they could protect their products through patents or other means. (14)

In addition to advantages in the production area were those to be found in the other major functional management areas of marketing, R & D and finance. This was not to leave aside the overall ability to manage, organise and coordinate which was more usually found in the larger firm. (15) Size itself was a further important determinant of whether the firm would produce abroad rather than export; it reflected many other attributes possessed by the firm, such as greater resources for capital, skilled labour, R & D as well as the ability to bear risk and compete widely. (16) The size of a consulting firm has been linked in Chapter 1 to the size of the project, which in the international arena is usually large, firm size in the international sector, which also would need to be fairly substantial, is also discussed later, in the empirical Chapter 5. How far the size of the consulting firm influences the outcome of the technology transfer projects it undertakes is also addressed in later chapters 7 and 8.

Behavioural and Locational Advantages

Penrose and Aharoni both contributed to the behavioural view of management's part in the international business activity, the former observing the importance of the existence of a management cadre able to react positively to investment opportunities. (17)(18) Organisational slack due to underutilisation of managerial resources and managerial growth were also considered. Aharoni saw the decision to invest as a series of stages with more impetus coming from managerial stimuli within the firm than the strength of good market opportunities. Such stimuli could also be outside the company or they might come in the form of sudden changes arising in the market environment. Internationalisation can be seen

as a series of progressive stages, as already illustrated in Figure 1-5 in the opening chapter but this is also discussed further in a later section.

Location theory has had a major influence on the choice that firms make in investing abroad. Cheaper labour costs overseas have an important bearing on the situation. The market could be particularly attractive if it had size and the promise of growth. Governments affected the process in the tariff barriers they imposed and in the climate of confidence they created. While the siting for the production and sale of mature products very soon came to be outside the home country, the work of Parry (19) and Kumar (20) indicated that these products also became modified overseas and then re-exported.

A sizable niche could be created for a generation of standard products in developing country situations, which were then easily exported to nations requiring similar goods. Empirical work up to the late seventies, pointed to location specific factors affecting the selection of the form of international involvement to be followed whether it was exporting, foreign direct investment, licensing or joint ventures. (21) The investigation, which follows later, of technology transfer in construction consulting, pays some attention to both the siting of this activity and the propensity to engage in joint ventures.

Nature and Use of the Firm's Assets

The involvement of a firm abroad may have arisen from the strength of its own assets compared to its competitors in any country in which it sought to work or it may have arisen from the resource advantages offered by that country. (22) It was gradually becoming clear that assets capable of producing income were not only those more tangible assets such as natural resources, manpower and capital (as covered by classical and neo-classical theory) but also the more intangibles including knowledge, management skill in organisation, market access and entrepreneurial flair (contained under neo-factor and neo-technology theories and others). All of these could come under the heading of ownership advantages.

These could be utilised where they were found, that is in the home country or they could be used elsewhere; when the latter occurred the locational advantages came into play. However, successful enterprises were not just those who had better

resources. The competitive edge was enhanced by some who chose not to use the market but decided to allocate resources within their own organisations, thereby "internalising" their advantages. (23)(24)

3.2 THE ECLECTIC THEORY

Dunning's eclectic theory brought together many of the earlier and more recent theories just discussed, in particular industrial organisational theory, locational theory and market failure theory; hence the term "eclectic". It explained the willingness of firms to serve certain markets and the reason for doing so. The theory also embraced the main vehicles of foreign involvement by enterprises viz, direct investment, exports and contractual resource transfers (e.g. licensing, technical assistance management and franchising agreements) and it suggested which route of exploitation might be preferred. (25)

For a firm to engage in foreign direct investment three conditions had to occur; firstly it possessed ownership (O) advantages; secondly it was advantageous to internalise these advantages (I) by making use of these ownership advantages itself; and thirdly it used these advantages in a foreign location combining them with locational (L) advantages derived there. (26) The extent that firms in a country effected production abroad depended on each of these factors; these factors were interlinked and were acknowledged to differ according to circumstances of the other factors. (27)(28)

3.3 OWNERSHIP ADVANTAGES - GENERAL (29)(30)

Ownership advantages, according to Dunning (31) included management and marketing expertise, access to technology of a particular type, ability to obtain or raise capital, access to raw material and other resources, plus other advantages due to size and geographical distribution of the firm; such advantages consisted of both asset and transaction advantages. The former, which was more intangible, arose from structural distortions in the market such as differentiation of a product or monopoly power. The latter, which Dunning called common governance, came from control of transaction benefits across different country networks. (32)(33) Ownership advantages were also specific to "firm", "industry" and "country".

("Industry" advantages are not expanded upon here because this study is limited to the one industry).

Firm Specific Advantages

Firm specific advantages were bound up with the firm itself. Such advantages arose from technology (consisting of information, knowledge, skills & expertise and intangible capital goods), an ability to differentiate products, brand names and the distinctions they could generate through advertising, (which were the result of marketing skills and R & D capabilities). Other strengths lay in size, reputation, large capital assets, ability to tap capital lending sources and access to raw materials. The latter could involve the control of its supply, transportation and marketing. (34) As has already been shown, the incoming international firm had to compete with other such firms and also with the local indigenous sector. In doing so the firm had to differentiate itself, its product and the service it offered in order to remain competitive. (35).

One example of this is illustrated in the work of Kumar & Kim, conducted with Korean multinationals, where the eclectic theory was used to explain the advantages that Korean firms had in particular marketing skills associated with negotiating with host governments; they carried lower overheads for their staff & labour inputs and less capital intensive technology. Korean firms also had personnel who were "highly committed to their work and were prepared to do everything within their capabilities to keep the name of the company and of Korea high in the international business community". Furthermore, "the salaries that they received were lower" than their Western counterparts and "this asset had been of greater value to Korean firms in trading and construction than those in manufacturing". (36)

Home-based Country Specific Advantages

Country specific advantages were associated with the nationality of the firm and were affected by the interplay between the home and host country. Dunning's firm specific factors are mirrored in country factors to some extent. (For instance the size of the nation's market will be closely linked with the size of the firm). The economic & business climate and home government policies could also have a direct

influence and there were indirect effects from cultural, economic, political and historic ties. (37) The influence of the British domestic construction sector and various governments' relative aid disbursements have already been touched upon in Chapter 1 & 2.

Korea has already been mentioned for its strengths in staffing. Their low staff cost and commitment were a country specific trait. It could be argued that in the case of Korea, advantages further accrued on account of the large number of young executives who could be counted upon to have overseas experience, which included familiarity with "the customs, traditions, business practices, labour laws, governmental regulations and market conditions of host countries. Some of these employees could be effectively used by these companies for initiating, managing, and administering" new endeavours abroad. (38) A further factor contributing to success was their extensive international networks. Korea was also benefiting from its long term policy of investing in certain developing countries; it was observed that political ties were being cemented, particularly in El Salvador and Sudan. (39)

3.4 INTERNALISATION ADVANTAGES - GENERAL

Internalisation was the second strand of the OLI paradigm. In a normal situation a firm with a relatively simple product might pass in turn through the stages of exporting, licensing and FDI. With the former there were low fixed costs; but variable costs could be high. Under the latter it made greater sense to invest directly in the host country, if variable costs became too high. Building on previous work, the internalisation concept was further developed by Buckley & Casson, whose least cost envelope showed that for reasons of costs, it was possible for a firm to move from exporting to FDI direct and not be involved in licensing. (40) Kumar & Kim noted that imperfect competition led a firm to internalise such major activities as training, marketing and R & D. (41) The limited extent of licensing, if any, in consulting and the matter of training in a technology transfer context are both addressed in later case studies, described in Chapter 7 and 8.

According to Dunning's writings (42)(43) on the eclectic theory, the internalisation (I) advantages came from an ability to overcome market failure arising from risk and uncertainty, production on a large scale, and service

transactions yielding cost benefits when compared to the external market. However other authors have noted that the "distinction between ownership advantages relating to the transactional market failure and internalisation advantages could become very blurred" in such cases. (44)

While internalisation conventionally regarded a joint venture as less efficient than a fully owned subsidiary it could be workable when there was a weak business sector and where technological diffusion was slow. Advantages could be gained, as has already been shown in Chapter 1, from knowledge of a local market or access to contracts through a joint venture. Equally a local partner could begin to compete using knowledge obtained from the foreign enterprise. Usually in such instances, host governments would want to determine the level of local sourcing and the improvement of local skills made possible through technology transfer arrangements. Most aid agencies were active in this process too. Later case studies try to assess which of these two parties brings the greater pressure to bear upon firms to implement such arrangements.

Cost and Finance Advantages through Internalisation

Hennart discussed "the conditions under which markets for capital, labour and know-how are likely to be internalised". He examined the experiences of foreign firms in the Malaysian Tin Industry for over a century of activity. Firms expanded abroad to coordinate resources using their own organisations because of costs; it was cheaper for them to use this route rather than relying on the supply of tin through the international market or through particular contracts. (45) Hennart concluded that internalisation "eliminates market transaction costs and shifts the firm-market interface". Seeing that the foreign firm would invariably experience a handicap as against the local firm, to overcome this, it would seek to import its own resources unless it could find and control them adequately in the host country. (46)

In a later paper, Hennart further investigated the Malaysian Tin Industry, particularly over the period from the latter part of the 19th century to the inter-war years. (47) The methods they eventually used to achieve foreign direct investment in Malaya involved exploiting an advantage using the internalisation process. When Western companies tried to set up in the area initially, they found

they could not compete with the Chinese community who succeeded in outflanking them on various counts. Western firms were able to achieve a competitive edge when hydraulic dredging technology became available. It is interesting that Hennart gave the reason as access to financial lending sources as the dominant factor rather than possession of superior technology know-how. (48) Finance is crucial to the go-ahead being given to projects in many developing countries often coming as bilateral or multilateral aid, as described earlier. At least one of the cases in Chapter 7 expands on the Build-Own-Operate-Transfer type of project where finance is a key part of a project involving technology transfer.

Different Emphases on Internalisation

A number of authors have disagreed with Dunning on his emphasis or otherwise on internalisation. (49) Rugman argued that the existing theories of FDI are basically subsets of the general theory of internalisation. Dunning however preferred to think of the eclectic theory "as a paradigm with internalisation being a subset of the general theory". (50) Casson was not supportive of Rugman's theory of internalisation (51) either, believing it to be too restrictive in its interpretation of internalisation of a market. However, Hennart in writing about internalisation considered that "giant strides had been made with the development of transactions costs/internalisation models and that these ... fitted comfortably within the larger framework of Dunning's eclectic theory". (52) It has been observed that the debate has "ranged to and fro, and the debate would continue". (53)

Networks and Transaction Cost Approaches

Johanson & Mattson sought to compare the network approach with the transactions cost approach, which is similar to that of internalisation. They further commented that, with internalisation, the firm's activities were internal while in the network approach, described in Chapter 1, activities were to an important extent dependent on the relationships with other firms, and thus on the network positions of the firm. In the transactions cost approach the emphasis was on why and when activities were coordinated "within" firms, rather than "among" them; in networks, the concern was the "dynamic aspects of industrial systems" and strategies "pursued by firms on such occasions". (54) (Some further strategy approaches are covered more fully later on in this theoretical chapter).

Networks were also seen as both stable and changing; each firm had relationships with clients and with other firms who were supplying the other services in the network. Taking the case of an established multinational enterprise, to a large extent it enjoyed "direct relationships with customers and users in foreign markets rather than indirect relations through agents or licensees". The large multinational firm did however use its network positions to effectively externalise some of its activities, yet it still maintained control even if it was involved in a measure of subcontracting. (55) Networks are also used by consultants but the level of such control that they are able to exert may not necessarily be as far reaching as that of the very large multinational firms.

3.5 LOCATIONAL ADVANTAGES - GENERAL

Location (L) advantages in the eclectic theory were influenced by special market failure, trade barriers and reduction in transport costs. Ehrman reviewed the many locational influences that have encouraged FDI, which have been covered in various texts. There were economic factors of production such as access to land, labour and capital in a foreign country, which were cheaper or more efficient than at home. Wider market opportunities provided a further incentive and distance from the market soon determined that these needed to be serviced on their own doorstep through FDI. There could be defensive reasons for setting up abroad, such as "safeguarding the firm's current export driven market share in the host country". (56) Under Dunning's location advantages a distinction was drawn between structural market distortions, such as government intervention, and transaction gains from exchange risks alleviation and multiple sourcing. (57)(58)

Further Expansion Overseas

Davidson identified three broad trends in examining firms operating overseas; "Investment activity was closely correlated with market size. Firms exhibited significant preference for near similar markets. The presence of an existing subsidiary exerted a positive effect on the firm's foreign investment decisions". (59) (This was along the same lines as the staged approach to internationalisation, described in a later section). He further concluded that corporate experience had two effects on location patterns. Firms preferred countries in which they were

already actively working. As their experience increased they tended to enter more unattractive locations, partly because other firms did not necessarily favour these locations. This gradually led them to seek more and more "global economic opportunities". (60)

An example of this was given by Kumar & Kim; in spite of the substantial penetration of Korean firms into the Middle East in the early eighties, Korean firms first invested in countries close to home in Asia, where they knew they would find similar cultural outlooks and could count on strong political ties. When they did expand to other continents they chose countries "which imposed relatively few restrictions on economic activities or in which governmental regulations were not strictly enforced". They also targeted countries "with rapidly expanding domestic markets" or those which offered "good prospects for mutually advantageous economic activities". (61)

3.6 THE ECLECTIC APPROACH IN RELATION TO OTHER DEVELOPMENTS

Towards the end of the eighties, it was significant that Dunning seemed to accommodate some of his critics by predicting that changes would occur in OLI advantages as the situation changed over time. For instance "as an enterprise developed a network of foreign affiliates the relative importance of factor endowments decreased and that of market failure was likely to increase" and again "ownership advantages of a country's enterprises would become more firm specific and less country specific". (62)

He also seemed to embrace (perhaps in true spirit of the eclectic approach) rather than modify much of the strategy and policy theory evolved by authors such as Porter, whose contribution is discussed later in Chapter 3. For instance, he noted the extent to which "different types of firms sought to coordinate their cross-border value-added investments, with the propensity to centralise or decentralise the location of these investments". (63)

From a locational point of view he saw some enterprises switching their presence from host to home country or to another host country as the situation developed over time; this sort of shift may also be reflected in the changing of location of the

office presence of some consulting firms, particularly as they become involved in the technology transfer side of projects.

The next section expands on the meaning of OLI advantages and reviews the ways in which the eclectic approach has been related to the international services sector and then to international construction. (64)(65)

3.7 THE ECLECTIC THEORY RELATED TO SERVICES AND CONSTRUCTION

Services

Boddewyn (66) discussed the question of whether international production theory could be extended beyond the traditional multinational manufacturing sector. This line of thought was relevant to whether or not the eclectic theory could be applied satisfactorily to the construction services sector, particularly consulting engineering which lacked the "concrete" productive nature of manufactured goods, more obviously found, for instance, in construction contracting. Many consulting firms also tended to be more international rather than overtly multinational.

Of further concern was what actually constituted an international service firm. Boddewyn maintained that there was no common measure that could be satisfactorily applied to the service sector to prove that any one firm was a service multinational rather than just an international company. Furthermore, most multinationals had a substantial service element in their business. He illustrated this by arguing (strongly) that "since all activity was about adding value and since to add value was to provide a service, everything that happened in the firm (extractive, industrial, commercial, financial etc.) was essentially a service. Therefore all firms and all multinational enterprises (MNEs) were ultimately "service MNEs" in some respects". (67)

He noted that the international banking and the hotel industry had been included in the MNE fold and that the eclectic theory had been applied to both sectors. Rather than dividing industries into service and non-service, more effort in the form of case studies should be conducted in particular service sectors. (68) More pertinently, he concluded that the eclectic theory could be applied to other

international service sector industries even though they did not appear to be involved in international production as tangibly as the manufacturing sector. (69)

Construction

In analysing international construction from the point of view of construction contractors, Seymour chose the eclectic theory because "it provided a general theory rather than a specific theory of the MNE and it drew upon many strands of other earlier theories" which have already been introduced in the first part of this chapter. He considered that "the theoretical framework of international production and the MNE could be applied to international construction despite the industry having special characteristics. The theory was thorough and flexible for an industry specific analysis of this type". (70)

Seeing that the eclectic theory may reasonably be applied to both "services" and to "construction", a more detailed view is now given as to how OLI advantages express themselves in each of these areas.

3.8 OWNERSHIP ADVANTAGES - SERVICES

Firm Specific Ownership Advantages

Dunning & Norman in considering ownership (O) advantages referred to some of the intangibles to be found within the business sector. These were information and management together with organisational and marketing technology. (71) As a manufacturing firm had access to raw materials and particular processes, so "in office activities the tremendous reservoir of organisational and management expertise, that had been built up over the years, could provide branch offices with information at a cost very much lower than a de novo indigenous firm would have to incur". These were comparable to trade marks in the consumer sector. There was an "identifiable image perceived by the purchasers of the services supplied by enterprises like McKinseys, Foster Wheeler, Peat Marwick, Arthur Andersen, Chase Manhattan Bank that gave these enterprises an important advantage over their lesser known competitors". (72) Foster Wheeler was one of the highly placed top international contractors introduced earlier.

Non-traditional service multinationals have attracted some attention in recent years. According to Buckley, low technology multinationals (such as some international contractors) were likely to have strengths in marketing and managerial skills rather than in technology. He also observed that "service multinationals were usually identified as information based, their competitive edge being given by access to privileged internal data" and smaller multinationals were often better able to adapt to opportunities of a particular market niche, being more flexible because of their size. (73)

Home-based Country Specific Ownership Advantages

The service sector has grown in many countries, taking an increasing share of trade. Certain service sectors gain prominence in some countries due to national policies, which can confer upon these countries particular home-based advantages whenever these firms compete abroad.

3.9 OWNERSHIP ADVANTAGES - CONSTRUCTION

Firm Specific Ownership Advantages

In a construction contracting services sector context, Seymour pinpointed four major firm specific advantages: the firm's name, human capital as well as the breadth of services offered and size, which were discussed under the heading of the total construction process in the opening chapter. The firm's name was intertwined with reputation, expertise and track record, including the quality of past work; the human capital element was seen as a vital and basic characteristic, as it is in any service type of firm.

Construction contractors considered their attributes to be their training of host country nationals, their ability to construct faster than competitors and joint ownership with local suppliers. The name of the firm was important in the bidding process and the product needed to be differentiated at such a time. Since service industries sell expertise and knowledge, the quality of the firm's human capital had to be maintained and developed. Most firms, in Seymour's view, would indulge in training either in a project context and in some other way within the firm. The quality of personnel was seen as "a major feature of competition" and professional

qualifications of staff counted for something in construction clients' eyes. (75) This theme of training, mainly as related to engineering consultants, is covered extensively in later cases.

Home-based Country Specific Advantages

Cantwell & Dunning assessed a selection of companies based in the UK in different industries, including construction. One UK company in the latter group said that its strength lay "in an ability to provide a total package to less developed country markets, consisting of finance, design and construction". Financial institutions had a key role to play in deciding whether or not a country, marginal because of its political instability, would receive vital funding; this agreed with Johanson & Sharma's observations on the importance of finance as discussed earlier. Funding institutions would also influence "long run commitment in a market" and the "role of the local partners". It is to be anticipated that this may also be an important factor in engineering consultants' business opportunities in the same kinds of developing country markets. (76)

In the context of international construction contracting, Seymour listed three country specific characteristics which could give the firm competitive advantage, namely: size & nature of the firm's domestic market (which were touched upon earlier), the demand for services related to those of the contracting firm and home government support. A particular threefold source of country specific competitive advantage, relating to the home market, was noted; these arose from the relationship between construction and other industries in the domestic market, the home country's own clients and other services related to construction. (77)

Examples from Various Countries' Advantages

Country specific advantages have been related to the strengths that firms have been able to build up in their domestic markets. Italian contractors picked up experience in dam construction; Brazilians had learnt to build power stations in "harsh conditions", which had led to an ability to train labour in developing countries; Korea and India had "plentiful supplies of trained labour" which aided the competitive process for them (78); Korea and Turkey exploited their labour intensive advantages, the latter also their religious ties; France used its nuclear

power experience; the U.S. its petrochemical and process expertise. Both US and French construction firms benefitted on the basis of their "approved" status in regard to military and defence works, the latter two countries gaining their experience initially in the home market.

As regards the demand for related services "the more a country's contractors were demanded abroad, the more the host country would favour the whole group within the industry". Also the visible international presence of own nationality consultants was seen as providing benefit for contracting firms at least in the anticipated flow of information on upcoming projects. More often than not, a link would help a contractor to win a bid, although the reputation of UK consultants for impartiality was thought (ironically) to have an adverse effect on UK contractor's bidding chances. (79)

If a consultant and contractor are from the same country, procedures and standards are common to both and bidding is made easier as a result. There would also be natural preference for the host country contractors by consulting engineers on the grounds that the cost of searching for a suitable firm could be less, since there can be an assumption of a guarantee and some close knowledge of the contractor from the home market. (80) The link between contractors and consultants on British led international projects is quantified to some extent in a later empirical section in Chapter 5.

For British international contractors, Seymour considered there were four major home based advantages that needed greater attention: the City, related financial sectors, other professions where representation is great (i.e. UK consulting engineers etc.), Commonwealth links and the UK manufacturing connection. (81) The last two points are given some further attention in the later case material, in Chapter 7, involving consulting firms.

Home Government Support

The role of government in investment and its support, or otherwise, of the construction sector was reviewed in the opening chapters. Seymour devoted considerable space to the matter of home government support for overseas construction contractor activity; France, Japan and Korea were seen as

"particularly interventionist"; Germany, Italy and Turkey provide "less coordinated policies", while US & UK had a "more laissez-faire" attitude. Indirectly links between governments could affect construction firms; Nigeria at the end of the seventies had strained relationships with the UK and this led to reductions in construction orders. The Israel-US relationship had even more of an adverse and long term significance for the US. (82)

3.10 INTERNALISATION ADVANTAGES - SERVICES

Service industries, which have involved relatively low amounts of technology and limited equity involvement, have needed some explanation to achieve a fit with conventional theory. Where buyer uncertainty was strong, transaction costs were incurred which could require the employment of a wide range of marketing skills. (83)

Boddewyn, whose arguments were useful in assessing the place of services in international production theory, surveyed the many studies that have been undertaken to explain FDI where there has been little or no equity involvement in both business and consumer services. He found that a measure of equity based FDI was to be found in such services "as accountancy, finance, consulting and advertising because quality was difficult to achieve through the licensing and franchising of services". The FDI investment was usually in offices but this involved lower outlays than would be the case, say in the hotel industry, where there was provision of a hotel either through buying or building one. (84) Internalisation occurred so that the quality of the business services product could be preserved more strictly; there were real dangers in farming this out to others. This was not the same in consumer goods where franchising could be allowed to proceed with the name of the product emerging relatively unscathed.

3.11 INTERNALISATION ADVANTAGES - CONSTRUCTION

Inter-regional Integration

The mobility of the construction product and its internationalisation were partly discussed in Chapter 1. Based on the work of Neo (85) and others, Seymour observed that in construction contracting, the construction base was transported to

the final product until completion, personnel being moved around construction markets to achieve this. This was the converse of manufacturing. (86)

In such a context, exporting and FDI, could be interchangeable and they could be used simultaneously in international contracting. The main difference between FDI and exporting was that "personnel were based in permanent or near permanent subsidiaries". (87) The mobile nature of the contractor's service helped this situation, particularly when demand was spasmodic and risk was high. The difficulty of accurately forecasting demand in some regions could make a permanent presence a less attractive proposition. However contractors found it useful to maintain such a presence for administration & bidding and for picking up information on upcoming projects. (88)

Various aspects of office designation were looked at by Seymour: permanent, subsidiary, regional and local but the dividing line that could be drawn between them was not always clear-cut. The flexible internal organisation of the contractor gave "scope for coordination of information and coordination of functions between regions" to the firm's overall advantage. The use of internal organisation provided some transactional advantages as resources were shared across regions. (89)

Enderwick found that "little weight was given to the desire to integrate overseas operations within a global strategy"; contracting firms were more likely to operate as international companies than "globally integrated multinational enterprises". Bidding tended to be done under the direction of the parent organisation rather than in the regional or affiliate office and there was some evidence of global sourcing. (90) Aspects of global strategy are discussed later.

Ownership Stake and Control

As has already been demonstrated, internationalisation can consist of a variety of organisational routes, Seymour argued that in construction this could be extended beyond a 100% ownership stake. In fact "joint ventures, turnkey management and (normal) subcontracting might be considered within the internal organisation of the contractor whereas in manufacturing this was regarded as a form of externalisation. The key was whether control could be exercised". (91) The contractor would use non equity and contractual forms of involvement in order best

to minimise risks. As regards the marketing operation, it was necessary for the firm to run its own subsidiary and this part of the business could not be put out to others. It was observed, while there could be a contractual approach to production, a special form of FDI would prevail in marketing; this would demand an "ownership stake which was a function of the intangibility of the asset". (92)

Enderwick (93) considered that "the volatility of contracting encouraged multiple modes of market servicing". The type of project influenced this mode; for instance, process plant projects could be the subject of licensing, although in other cases, Seymour found that as predicted there was a lack of licensing amongst international contractors both for reasons of ensuring product quality and because the product was not standardised. Where developing countries lacked a qualified management, turnkey and management contractors could come to the fore.

Other Types of Integration

Seymour also discussed the extent that contracting firms would enter into backward integration related to materials, consultancy, financial & feasibility studies etc. It was concluded that resources which had alternate uses in other industries would not generally be internalised. If they were, inefficiency could arise since resources might be underutilised. For this reason consulting engineers and architects were not likely to become part of the vertical integration strategy of international contractors. Internalised resources, which were hired out to other industries, actually increased the demands on management supervision. This meant that contractors tended to internalise only those personnel who did not have uses in other industries. (94) As has already been shown, British consultants have developed a larger range of markets and clients than contractors and appear to have wider networks. For a consultant to be vertically integrated into a contractors' organisation might create a situation which, in effect, would cut down on the consultant's contact network, reduce their independence and add to costs.

3.12 LOCATIONAL ADVANTAGES - SERVICES

Location-bound Services

Some services come into the category of being "location-bound" and they are usually country specific. Service products (such as hotels) have to be administered where they are called for, since that is the nature of the service; it can be seen that there are similarities here with construction. As a service becomes more foreign tradeable, "the common variables of size of market, quality of local resources, (host) government policies and political climate all affect location choices". (95)

A View from Banking

Nigh (96) investigated locational factors associated with US banks. They found that US banks followed US companies and that such a business presence had a strong positive effect on US branch banking activity in that country; this held for developed or developing countries, and for the regions of Europe, Latin America and Asia. Business opportunities presented by the local market actually had little effect on US banking activity. Seeing the importance of the service sector in the international economy, of which banking was only one industry, Nigh concluded that "further research into the internationalisation of firms in other service industries would be most appropriate"; this serves to support the investigation work being carried out in later pages. (97)

Office Locations of Consultancies

Dunning & Norman used the eclectic paradigm to investigate international office location in the UK with foreign MNE firms in six different sectors, which included management & business consultants and related business services, as well as engineering consultants. (98) Like Seymour, they looked at regional and branch offices but found that with advancing information technology the division between these often became less easy to define. (99)

3.13 LOCATIONAL ADVANTAGES - CONSTRUCTION

Initial Decision to Move Overseas

Seymour (100) investigated the underlying factors influencing the initial decision to go overseas, the choice of market and conditions determining the setting up of a permanent or temporary office. He found that first moves overseas sprang primarily from a desire to improve profits, from the invitation of home country clients & host governments and from a need to diversify risk. The major locational incentives causing firms to locate overseas were predominantly size of market (which was similar for services generally), opportunities for control of capital, clients' positive attitudes to the firm and home to host country political links. In addition, a favourable impression of the firm in the region, proximity to other subsidiaries, availability of expatriate staff and of financial & consulting services were also of importance. (101)

Seymour noted that "if a contractor sensed much competition from other international firms or the indigenous local sector was strong, the contractor would not locate in that country". This was contrary to a Knickerbocker (102) type of interpretation, which would have predicted that firms would be strongly influenced by a competitor to enter the same market

On locational aspects, Enderwick (103) noted, from a survey of the construction sector, "locational substitutability" was very low for most construction projects because they had to be produced on the spot. Like Seymour he observed that contractors had withdrawn from areas with reduced demand and from politically unstable countries, partly because this soon affected the insurance cover that could be available to the firm. Specialist contractors were more likely to stay in countries with "technologically advanced markets".

Office Locations of Engineering Consultancies

In an investigation by Dunning & Norman on various engineering consultancies who were considering setting up office (in the UK), most of the firms found it necessary to move directly to the UK for reasons of an increased need of a personal presence

but they were also particularly attracted by the large potential market and the prospect of growth. A good proportion of firms were further influenced in their decision by the actions of competitors who were entering or about to enter the same market. Contrary to the earlier findings for contractors, this tended to support the findings of Knickerbocker except that the cost of exporting out of Britain were also mentioned to be of some consideration in this decision. For management and business related services, the findings were not dissimilar except that an additional factor was cited which related to the "need to capture benefits of integrating activities in UK with other parts of the corporations activities". It was generally held that the cost of exporting was assessed qualitatively rather than quantitatively in terms of "information loss, inconvenience and time" (104) Dunning & Norman (105) then investigated a wide variety of locational factors influencing the establishment of an overseas operation. For engineering consultancies proximity to clients, proximity to specialist services (legal, financial, other consultancy etc.), transport & communications & airports, travelling costs of executives, availability of professional & technical labour, language, business framework and availability of premises were all seen to be of major importance. Market size and prospects cropped up again but local availability of professional & technical staff and congenial local environment were also significant. They further noted that engineering consultancies had a particular preference for being near to competitors due to special labour requirements while skilled engineering staff were reluctant to work in locations too far away from the centre of activity.

3.14 APPLICATIONS TO SERVICES - GENERAL

In the services sector the major advantages (see Table 3-1) are organisational, managerial and marketing skills emanating from a firm with an identifiable image and well known name, often with access to privileged data. Firms internalise this information which can be disseminated through a spread of offices and offered at lower costs than would be possible through the external market. Quality in many services businesses has to be preserved using the internal market. Favour with host governments, size of market and access to local resources are all factors in the decision of the services firm to set up office and invest in the host country.

SUMMARY OF ECLECTIC THEORY ADVANTAGES - SERVICES

OWNERSHIP ADVANTAGES

Firm Specific

Reservoir of organisational expertise

Marketing and managerial skills

Information availability within the firm

Identifiable image: well known name

Access to privileged data

Ability to adapt to market niche

Country Specific

Encouragement of services sector by home governments

INTERNALISATION ADVANTAGES

Investment in offices

Quality preservation in business services

Information provision to branch offices at lower costs

LOCATION ADVANTAGES

Size of market

Government policies and political climate

Firms in local market favourable to firm

Access to local resources

Source : Author

TABLE 3-1

3.15 APPLICATION TO CONSTRUCTION SERVICES

Leaving aside the consulting side of services, which is discussed at the end of this section, it can be observed that there are similar advantages in construction contractor services as there are in services generally. As would be expected, these advantages are specifically geared to the construction industry itself (see Table 3-2).

Hence firm specific factors emerge in the form of breadth of services, experience, speed of construction and knowledge of suppliers. There is also a strong hint of an advantage derived from training host country nationals. (The differences between training in technology transfer for construction contracting and construction consulting are explored in the case studies appearing in Chapter 7).

Compared to services in a general context, there are many strong home country advantages in construction. For example, a strong domestic market, as already highlighted, can give rise to experience in particular sector disciplines; also home government support and financial bodies can play a crucial role. Due to construction demand being derived from other industries, as was discussed in Chapter 1, it would be expected that links to other industries and also to other construction groups, particularly in a British context, would all play a prominent part in compounding ownership advantages.

Construction services firms have to maintain considerable mobility in order to meet the needs of a location bound service. They internalise their advantages and this can involve them in office networks with a sharing of resources across regions. There is usually close control of the marketing outlet, expressed in ownership; in production there is greater flexibility to use the construction contract system through joint ventures and subcontracting yet still maintain effective control. At times, it makes sense to enter into vertical integration by acquiring certain resources such as materials (e.g. quarries) or suppliers (e.g. specialist plant); on other occasions a fully integrated service might be offered as a turnkey project. However, consulting services have a much wider international network of their own and for the most part they tend to remain separate from the construction contracting side of services.

SUMMARY OF ECLECTIC THEORY ADVANTAGES - CONSTRUCTION SERVICES

OWNERSHIP ADVANTAGES

Firm Specific

- Depth of human capital
- Name, reputation and size of firm
- Breadth of services and experience
- Training of host country nationals
- Ability to construct faster than competitors
- Joint ownership with local suppliers

Country Specific

- Home financial bodies and package provision
- Size and nature of domestic market
- Home government support
- Home projects in particular disciplines (eg dams)
- Government approved status in certain types of work
- Common home procedures and standards
- Home firms well known, measure of guarantee
- Plentiful supplies of construction labour
- Links to other home industries (eg manufacturing)
- Home country clients
- Links to other home construction groups

INTERNALISATION ADVANTAGES

- Mobile nature of services
- Scope for coordination of information
- Coordination of functions across regions
- Sharing of resources across region, some global
- Control of marketing outlets
- Vertical integration of some resources, turnkey etc

LOCATION ADVANTAGES

- Size of market
- Home/host country political links to firm
- Proximity to clients
- Opportunities for control of capital
- Proximity to other subsidiaries
- Access to expat staff abroad financial and consulting services
- Reduced travel costs
- Access to technical expertise

Source : Author

TABLE 3-2

From the locational point of view, it has been emphasised that there are the considerable attractions in the size of a market but firms also locate overseas to be nearer to a local client, reduce their travel costs and gain access to control of financial capital, as well as physical and human resources.

3.16 APPLICATION TO CONSTRUCTION CONSULTING

Early theories would predict that project business in international construction consulting is likely to be obtained because the UK is well endowed in consulting services and developing countries do not have these same human capital skills, although they are in need of much infrastructure development. Consulting firms have had a compensating advantage expressed in a particular reputation and expertise to offer, which is not necessarily found within the host country or even amongst competitors. Construction consulting services like other products has a product cycle, which when applied within home borders successively, can then be carried overseas fairly easily at a later stage, particularly since the needs of overseas projects invariably seem to mirror a recently completed construction era in the developed world.

There has been considerable involvement of UK consulting engineers overseas in markets where there have been historic ties; usually firms have begun in areas favourably disposed to Britain, and then worked out from there. The initial stimulus to go abroad can often be seen to spring from some very active engineering management group running a firm or from some environmental change, such as the oil price rise of the seventies, which thrust many consultants into the Middle East rapidly.

It has been demonstrated that there is evidence from various quarters that the eclectic theory has been applied satisfactorily to both wider services and to construction contracting services sectors. This suggests that the same application can be made to construction consulting itself.

Taking a more detailed perspective, the extent that consulting firms in a foreign country carry out the productive design activity depends on country and firm specific factors. As was discussed on the topic of internationalisation in Chapter 1,

International consulting firms have been able to begin from a pure exporting base by making sorties into the region/country where the design work was to be done, then returning home to do the work. Initially it was not even necessary to establish an office but as clients became more choosy and as competition increased it did become advisable to set up in the country. Both country and locational factors influenced the setting up of a subsidiary, with partial or full FDI, and they also played a part in determining where the design and organisation work would be carried out.

The eclectic theory would emphasise strongly that it is due to the ownership advantages that British consulting firms have the capability and strengths to participate abroad. The firm specific advantages that consulting firms might display, would likely be tied into the name of the firm, its reputation and breadth of services and experience offered. There would also be further strengths in human capital and privileged data related to the conceptualisation of projects and capabilities in design.

As an extension of the country specific factors in ownership advantages, home country factors also apply: (i.e. whether there are political links with certain regions, sufficient home government incentives operating and whether aid agencies are backing projects in that area). The fact that there are certain levels of input from bilateral UK aid funding upon which consultants can depend is a not insignificant factor here; these were referred to in Chapter 2 when Britains' multilateral to bilateral aid contribution was listed against other competitors. The indicators that the UK domestic construction market has taken an upturn in the second half of the eighties should further influence the capability to operate overseas at least in the short to medium term. The networks that have been developed by other UK groups or the presence of other professional firms overseas can also influence the outcome of project work available to British consulting firms.

As to any uncertainty experienced by the consulting firm, the design must fulfil a function of need and yet be carried out soundly and safely in all key aspects. The predominant matter is whether control of the design process can be effected satisfactorily and whether marketing information on new projects can be gleaned by the firm and kept within the firm to enable it to compete and win projects ahead

of a competitor. Subsidiary offices therefore appear to have a key role to play, as do the firm's own networks of relationships around the world.

Vertical integration is not always indulged in by consulting firms because it is not all that efficient to commandeer the downstream side of construction but more advantageous to leave it to others; usually contractors are better placed with their broader capital base to handle the resource demanding construction phase of a project. The mergers that have been taking place in British consulting seem to be moving much more along the lines of horizontal integration. In Chapter 2, it was noted that some key players in the British sector have merged or acquired smaller or medium sized firms.

The decision to locate in a particular country depends often on the locational substitutability of the consulting service product which may on the client's insistence have to be done in the host country itself. However computer draughting and fax facilities allows information to be transmitted across the world relatively easily and this makes it much more difficult for the client to tie down the actual location of the work. Even given these extra aids to the productive effort, it may be that firms would still locate abroad, because they might otherwise lose out on local market information or face inconvenience and delay in commuting back and forth across the world.

It is possible that the requirements for technology and know-how transfer arising from the policies of host governments themselves has meant that the activity of international consulting be located much more overseas. This has led to the employment of nationals in the firm for further reasons of cost or political expediency. The trend has also developed of joint ventures with local host country consulting firms again, with an emphasis on know-how and technology transfer in any agreement. At times this can be an essential part of a project; (whether or not it is, remains to be investigated in later chapters). What is more clear is that a fully competent local host country consulting sector is the ultimate objective of most developing countries but they are often frustrated in their attempts to achieve this end and it would appear that for some it may yet be a long way off.

While the eclectic theory has had its critics for its lack of a dynamic dimension, (although this is less true since Dunning's revisions of the late eighties), it is

useful in explaining why British international construction consulting firms have reached where they are now in various forms of involvement and what combinations of advantages have permitted this to take place. At this point it is appropriate to move on to the second strand of the theoretical approach by examining the stages-of-development (internationalisation) model as well as strategy and professional services theories.

INTERNATIONALISATION

3.17 DEFINITIONS OF INTERNATIONALISATION

Internationalisation has been considered to be a process (106) (107) in which "firms steadily increase their international involvement through gradual acquisition, integration, and use of knowledge about foreign markets and operations, and through successively increasing commitment to these markets". (108)

In other contexts internationalisation has referred to "the entire range of methods by which firms have supplied overseas markets and operated abroad, and thus has encompassed equity and non-equity arrangements, with different forms of financial and managerial commitment and different forms of control". (109) Methods of internationalisation have been similarly interpreted as extending through varying ranges of risk from exporting through an intermediary agent to a wholly owned subsidiary and also through other arrangements such as joint ventures or management contracts.

3.18 THE STAGES-OF-DEVELOPMENT APPROACH

There is much literature which has emanated from Scandinavia on the subject of internationalisation. Johanson & Vahlne (110) argued that expansion into overseas markets proceeded as a series of steps or a staged hierarchy which meant that "the export development process of firms tended to proceed in stages"; considerations that influenced a firm's progression from one stage to another tended to differ by stage.

Exporting

Wiedersheim-Paul (111) examined the pre-export activity of Swedish firms as the first step in internationalisation. Of special importance were the factors of information, the characteristics of the decision-maker, the enterprise environment and the extra-regional expansion of the firm. Firms were seen as being either domestic, passive or active in response to export opportunities.(112)

A number of export theories from the sixties onwards have been reviewed by various authors in a spread of countries. (113)(114)(115) Reid, for instance, considered that the export expansion process could be represented as a progression, involving "awareness, intention, trial, evaluation and then acceptance or rejection". (116) Exporting was crucial to many firms in some of the survival strategies they had; their motivation often sprang from a reduced domestic market, a realisation that the product could match an overseas need, a straight desire to grow and use the firm's resources and, not least, from the drive and expertise of management. (117)(118)

Organisational characteristics associated with export activity were further examined by Cavusgil. (119) Evidence was again given to support the view that managers' attitudes, experience, motivation and expectations were all critical factors determining whether or not a firm became active in foreign markets. They pointed further to strong linkages between export behaviour and the "acquisition of export-related information, and the willingness to take action".(120)(121)(122) The importance of gleaning information on international projects and the particular opportunities presented via technology transfer are discussed in later case studies.

In assessing the fortunes of exporters, Cooper & Kleinschmidt drew upon Porter's view of focus through differentiation, which is discussed later on in this chapter; they commented that "market segmentation and designing products specifically to suit target market segments was an appropriate strategy; product adaptation and market segmentation were key ingredients for success", particularly in terms of export growth. (123) Although the industry they investigated was technologically complex, there are similarities in the construction consulting sector which can also be segmented into product and discipline sub-sectors.

Rigidity in Internationalisation

Luostarinen (124) discussed the many factors that could hold a firm back from investment in foreign locations. (125) Managers' "rigidity" was put forward as a significant factor deterring firms from proceeding overseas. Some of the rigidity in the firm however was organisational in that the firm was tied in to the actual physical elements of procurement, production and distribution although "triggers" with enough relative strength could "push" a firm to internationalise. As firms gained experience in foreign markets, the rigidity was likely to be progressively reduced. Products had to be competitive to yield results and the home market provided an opportunity to learn about getting the product right as far as home clients were concerned. However the selling of non-competitive products, which were surplus to capacity, was not likely to improve the learning process in the firm or to lead to much reduction in rigidity. (126) Luostarinen considered that internationalisation itself "fed upon and contributed to the development of international knowledge and experience of the people involved".(127)

Firm Size and Overseas Activity

There was some debate, on either side, on the importance of the size of the firm as an influence on international expansion. (128)(129)(130) Firm size was seen as providing certain advantages in terms of a greater availability for such resources as production, finance and management. Indeed, sometimes firm size acted as a proxy for various other advantages. (131) Delacroix commented that there were two distinct reasons why size would affect international capability: "Firstly large production units permitted economies of scale and price competitiveness remained an important factor in international competitiveness. Secondly large firm size might be an essential asset, if not a precondition to effective international marketing". (132) As mentioned earlier in this chapter, the size of a firm in relation to technology transfer projects is one consideration in the later Chapters 7 and 8.

3.19 THE STAGES-OF DEVELOPMENT APPROACH EXAMINED

The staged approach was essentially therefore one of experimental, active and committed involvement. This would take a firm from one or two markets, usually psychologically near to them in the first instance, to systematically investigating others until they had a long term commitment wider afield; it could lead in time to a "broader spread of activities where the coordination of them might be high" in a global context. (133)

In the manufacturing sector, there was evidence from various Nordic studies that the time between stages varied considerably. In other countries, as many as a third or a half of the firms had invested directly abroad without any previous involvement at all in the market. Contributing factors were a high spend on R & D, short life cycle of products in some industries, a greater dispersion of knowledge of markets and better education of entrepreneurs particularly if in high-tech related areas. (134)

Luostarinen & Welch also observed that some service firms had leap-frogged the intermediate steps of internationalisation and moved straight to direct investment; the process of internationalisation was invariably irregular and was frequently "lumpy over time". Plateaus occurred as previous moves were consolidated. (135) Johanson & Vahlne later considered that there could be exceptions to internationalisation in small steps where the firm had multiple resources to dispense in reasonably stable conditions and when it had already learnt much from a similar market. (136)

Some Comparisons with the Eclectic Approach

While the eclectic paradigm assumes that perfect information is available to decision makers who are reckoned to act rationally, the internationalisation, or stages-of-development approach, adopts a behavioural view assuming that firms will want to limit uncertainty. The perception of what their transactions costs will be in the future tends to reduce over time as further international experience is gained. However in the faster changing environment of recent times, the staged approach may well be less supportable. (137) In fact most backing has come for studies in the earlier rather than later stages of internationalisation and psychic

distance as a barrier to expansion has been less in evidence as the world has effectively become smaller. In future both language and cultural issues are more likely to increase their influence. (138) The appropriateness of technology transfer in a cultural context surfaces to some extent in the analysis following the later case studies, appearing in Chapter 8.

3.20 FURTHER MODES OF OVERSEAS EXPANSION & ENTRY STRATEGIES

As was illustrated in Figure 1-5 in the opening Chapter, it was usual for a firm, in the early stages of going overseas, to look for a foreign intermediary or agent to assist in market penetration. As experience grew however there was a tendency to scrutinise the intermediary's activities and seek to control them more closely. The firm had either to move towards withdrawal or draft in key personnel to beef up the local operation which then came close to direct investment in the country. (139) There are other modes of market entry which may also be considered to lie within the domain of the stages-of-development approach. Management contracts and joint ventures, for instance can form a stage of development which may be used under particular circumstances. Most of these modes were introduced in the opening chapter, although some wider implications for strategy are explored here.

In the wake of Johanson and Vahlne's earlier work, and building upon it, Sharma & Johanson (140) produced a useful set of strategies for technical consultancy firms, assuming they were involved in networks of relationships with other industrial organisations. The selection of an entry strategy was considered to be dependent on a number of variables which were both internal and external to the firm. Internal strategies took account of the firm's characteristics such as size, experience and technology, while the external characteristics related to the firm's networks, the competition and the client.

"Alone" and "Cooperative" Strategies

The "alone" posture was usually adopted by a firm which was substantial enough to compete in its own right. Alternatively a medium sized or smaller firm might "try to enter the project at a less resource demanding phase". This could lead the firm to depend on another organisation, who would "have to be either unable or unwilling to undertake those tasks" (141)

The cooperative approach with other firms in the network was seen in terms of a "consortium", "grouping" or "alliance". A consortium approach appeared to be appropriate in large project situations where any one consultant lacked all the resources. In the grouping approach the consultant joined with other non-consulting firms who were each carrying out different tasks; here consultancy might be one smaller part only of the wider group. Under an alliance (a kind of joint venture) a consultant joined with a local firm in the host country. (142) The literature on joint ventures is plentiful; in the next section it has been drawn from the contribution of a number of authors, mostly in the construction sector.

3.21 JOINT VENTURES - SOME PROS AND CONS

Joint ventures allowed firms to complement their resources in technical, managerial and productive areas where available so that resources could be freed in other directions. Risk could be diversified in areas which were unstable politically. (143) The credibility of a prequalification was increased by offering the committed resources of two or more companies; there was a reduction in "exposure" on very large projects and there was gain through combinations of general resources, specialist skills and bonding requirements. (144)

For the incoming firm, the joint venture local partner provided local influence, knowledge of local conditions and an awareness of the most likely firms with whom to work. Where competition by price was practised the costs of making a bid could be kept down with the cooperation of a local firm. (145) Minch saw greater strengths by combining rather than "going it alone". (146) Bias against the firm could be reduced and possibilities opened up for market surveillance. (147)

Developing country firms sought joint ventures for reasons of increasing their skill and expertise and for access to foreign technology. (148) The foreign partner brought credibility without which little financial support would be forthcoming. (149) They also gained access to wider sources of finance and to various modes of training arrangements. (150) However due to world recession, by the early eighties, many developing countries were still unable to afford foreign organisations and had sought to do the work themselves. Often there were serious management and technical shortcomings which were being corrected by short term

provision of experienced personnel from foreign construction organisations (151) The management contract was a further alternative, here, which is described more fully later on.

The joint venture route also had to take account of different cultural, religious and sociological backgrounds for the separate staffs involved. Great care was needed in choosing the local partner. Interests needed to be complementary with each partner knowing the inputs required of them and the amount of technology and training, if any, required by the client. (152) They had to trust each other, share common values and understand each other's expectations of the results of their collaboration. (153) Apart from the fear of underperformance, past failures could often be put down to lack of communication and misunderstanding of intentions. (154)

3.22 CLIENT-RELATED STRATEGIES LEADING TO TURNKEY/PACKAGE DEALS

In making an entry into the market (apart from joint ventures with other firms) it was also necessary for the firm to consider the nature of the client networks and any kind of preference they might have for particular types of projects. Some clients had considerable experience in consultant's work and knew much about the processes of consulting. Other clients were completely new. In the same way that the consultant might be linked with a network of firms in the normal course of doing business, the client would also have his own network of organisations with whom he interrelated and all these influenced the overall decision taken. (155)

In this regard the clients could also follow their own set of strategies; for instance they could be either "piecemeal" or "project", that is, the client might obtain consultant services for the whole project or part of it, possibly in stages. (156) The "project" approach might extend to the package deal discussed in Chapter 1. There could also be "open" or "closed" strategies when a consultant tendered with many others, or, at the other end of the spectrum, was able to negotiate with the client direct. Often turnkey or boot projects work well in such a closed type of environment.

A further strategy adopted by a client in seeking a consultant was to measure "price" against "quality". (157) The client would also be influenced by whether or not it existed in a protectionist government environment, although this would apply more in a planned economy. "Protectionist" v "competitive" strategy therefore described either an approach which allowed competition equally amongst all consultant firms, or one which did not. (158)

3.23 MANAGEMENT CONTRACTS

Sharma discussed three different strategies used by firms when undertaking management contracts in host countries: a "Control" strategy gave the opportunity for the longest period of influence, a "Marketing" strategy led to the greatest quantity of products sold while a "Cash Cows" approach led to the highest level of fees (see Table 3-3). (159)

In management contracts, the foreign firm "usually supplied a handful of experts who were deployed in key positions ... and this permitted expatriates to control the strategic decisions" which had further implications for exercising control in the longer term. In fact, the influence of expatriates was far greater than their number would suggest; the criteria, for instance, used for recruiting local people was decided by the expatriate. (160)

Chandler (161) first observed in depth that there was frequently a lag between the change in the strategy followed by the firm and its structure. In the case of management contracts, the structures that were set up in the local organisation in order to implement the desired strategies were often "still in existence for many years after the expiry of the management contract", which extended the influence of the expatriate manager over the local situation. (162)

Furthermore, there was often insufficient time for the local organisation to learn the necessary management skills and the dependent relationship continued long after that which was first envisaged. Even without this extended time factor, formal and informal relationships were formed between local managers and expatriates during the management contract "which created a strong preference for similar business dealings after the contract had been completed". Any future

MANAGEMENT CONTRACT STRATEGIES

"CONTROL" STRATEGY

Foreign firm primarily interested in exercising control over a local firm with the intention of integrating its activities into its overall global operations

Convenient where a wholly owned subsidiary not established in the country

Access to local resources sometimes an attraction eg raw materials or labour, although benefit derived from local operation itself not necessarily very great

Not uncommon to find the foreign firm engaged in all aspects of the operations of the local firm on both a short and long-term basis

Sometimes suspicion, when the foreign firm used its position to improve its overall profit but limited benefit for local firm from foreign experts

"MARKET" STRATEGY

Used by firms who wanted an outlet in the host country for their range of products

Sometimes forced to accept a management contract but not very interested in the management contract itself

Keen to create a market for their products, where they would expect to obtain most margins

Benefit to the local firm in the up-to-date know-how continually available

Tendency for the incoming firm to be insufficiently familiar with those management and marketing techniques most suited to the local situation

"CASH COW" STRATEGY

Described overt situation where foreign firm sold management services as major part of its business

Financial resources not invested in the local firm and fee related simply to the extent of the management service offered

Since neither owners nor full operators in the industry in which firm offered management, not always in the best position to know idiosyncrasies and latest technology of the industry

Local firms dealt with a foreign firm with the least amount of ulterior motive although not necessarily the most enlightened service

Source : Adapted from Sharma (87b)

TABLE 3-3

stability in the client/firm relationship was thus assisted by such contacts. A further point of interest was that local firms tended to select a partner for a management contract with whom they had worked before, on as much as three out of every four occasions. (163)

Management contracts could be entered into without the recipient firm being fully aware of the technology required. Sometimes this was because the local recipient firm did not possess the local managerial capacity to assess the technology most suited to local need. Indeed, the very aim of a management contract might have been to develop the local technical and managerial capability through association with an appropriate foreign firm. (164)

Sharma concluded that, "through a management contract, foreign firms were in a position to enter into long-term relationships with the local firm and its decision makers. This would considerably improve the impact of a management contract on the local firm and create avenues for future business in the shape of technology and equipment sales". From the host country viewpoint, it also had to be remembered that sometimes local firms expected a management contract to solve too many of their problems at once and they could enter into them with unrealistic expectations. Despite that, Sharma considered that international firms would be well advised to "view management contracts as a long term business engagement and nurse" the opportunity so presented. (165) The same long term effect observed in management contracts may possibly be detected in the technology transfer area of construction consulting, as discussed in Chapter 4.

3.24 WHOLLY-OWNED SUBSIDIARY OFFICES

At the end of the spread of alternative methods of international market entry is the wholly owned subsidiary. Multinational firms have preferred full 100% ownership so that they could insist on "tight controls either for manufacturing or marketing reasons or to protect proprietary technology". Foreign direct investment was usually either market-oriented, where exports were replaced with manufacture in the country, or cost-oriented, where lower-cost labour was the attraction, or resource-oriented, where available resources were important say in a vertically integrated energy industry strategy. (166) In consulting, the need to

protect proprietary technology is not always as great as in some types of manufacturing. By comparison, the productive design process is not nearly as visible; also there is little evidence of vertical integration for the purposes of acquiring resources such as materials, although the turnkey and package deals reflect this integrated approach to some extent. However the subsidiary office, which is usually wholly-owned, does benefit from market and cost-oriented FDI by reaping the advantages in cutting down on the productive costs of design, through less travel of personnel to the host country, and in accessing lower labour costs, if indeed these are available locally.

3.25 APPLICATION TO CONSTRUCTION CONSULTING

Initial moves overseas by consulting firms may begin with a lack of clear objectives or just an unexpected request to work via the construction network system. It may be helped by the leads derived from extra-regional expansion (or domestic internationalisation) within the consultant's UK offices. Actual knowledge of projects underway provide an overall sense of awareness giving stimulus for consulting firms to imitate some of their more successful fellow firms in the industry. Bad experiences overseas can cause withdrawal as has been seen for some UK international contractors, mentioned in Chapter 2.

Low quantities of commissions from UK domestic construction orders are predicted to act as a trigger for consulting firms to take on overseas projects. However there would also have to be a meaningful commitment of senior managers and the proper provision of resources. Consulting firms with low amounts of penetration abroad may be likely to face more risk than they might expect; also too short a term view might be taken. Project information is likely to be vital for the firm but some of these sources, as introduced in Chapters 1 & 2, can be quite diffuse in the international construction consulting industry. The size of the firm may or may not be important; in terms of the production design office, economies of scale may not matter much but they could be crucial in terms of project intelligence gathering. Rigidity may well be apparent in some longer established and larger consulting practices which may hinder their progress. Smaller consulting firms may be able to do well if their staff are sufficiently flexible, active and experienced in certain kinds of segmented work.

There is a suggestion that if firms use an intermediate agent abroad, they can later be presented with problems of control or incompatibility. Apart from the use of an agent, the tendency to adopt an "alone" posture, rather than a consortia with others is likely to be more prevalent in UK consulting because the sector is much larger than the Scandinavian sector and there are a greater number of larger UK firms, who can operate abroad under their own steam. Consortia approaches could still have their attractions in some smaller and medium sized UK firms, however, as they have in Scandinavia. Joint ventures with other British consulting firms have clear advantages for a firm when it is competing on the very largest projects since greater resources are made available and there are prospects of better risk sharing. On the other hand, in the context of joint ventures with host country firms on technology transfer projects, local knowledge and lower costs etc. can again be an attraction. From the local firm's view, skills are increased through cooperation and local construction organisations usually benefit. However poor communication between the parties and underperformance from the host country side may restrict genuine constructive activity from the UK consulting firm angle.

Due to the nature of the construction industry in many countries, which was discussed in the first Chapter 1, clients can in some situations be in a strong position vis a vis consulting firms; some are well informed and some less so. Given such relationships, consulting firms have to tailor their project arrangements to both the networks and strategies of these clients, by adjusting to a total or partial offering, through, for instance, turnkey or management contracts. Some of this may have to depend on the openness of the relationship that the firm can establish with the client and how protectionist the host government policy is. The lessons for technology transfer from the management contract are that a dependent relationship may become established for a much longer period than might be envisaged at first. This would appear to occur at both an organisational and individual manager level, depending on what key roles the firms and managers are able to play on the international projects they undertake.

One of the observations in the earlier part of Chapter 3, under the heading of internalisation, was that FDI (through wholly owned subsidiaries) and exporting were interchangeable due to the mobility and nature of the service in international contracting. In consulting, full investment in autonomous local offices in host countries would seem to be a logical progression for firms for reasons of costs,

client pressures etc., as has already been shown. Due to an equivalent or even greater level of mobility the extent that they "set up shop" in a full manufacturing sense in the host country, would seem to vary. However the optimum move would be towards a fully fledged and independent subsidiary office when all the functions, of marketing, design, bidding and finance are carried out locally. How much this occurs in consulting particularly on technology transfer projects is open to question. Due to the mobility of the consulting service, that part of the productive work which relates to technology transfer, may well be conducted in different locations; this aspect is addressed to some extent in the later chapters. Further coverage is also given in Chapter 4 of literature which helps to explain in much greater detail the process of technology transfer and some of the issues involved in the construction consulting sector.

THEORETICAL STRATEGY APPROACHES

3.26 STRATEGIES OF LARGER GLOBAL FIRMS

Competitive Advantage and Competitive Scope

Porter investigated the various facets of competitive advantage, beginning on a domestic basis and then extending his analysis to an international framework. Competitive advantage would spring from the value a firm could create for its clients (or buyers). Any firm or organisation had a value chain made up of support and primary categories of activities, shown in the value chain in Figure 3-1. (167) The primary category extended from upstream "inbound logistics" to the downstream "service" side of its fundamental business. In carrying out these basic tasks the firm had its own support activities such as its firm infrastructure, technology development and human resources etc. (168) Porter argued that "analysis of the value chain rather than value added" was the optimum way to assess competitive advantage. (169)

A firm could develop three main strategies: cost leadership, differentiation and focus. (170) Differentiation, in Porters' view, "allowed a firm to command a premium price, to sell more of its product at a given price and to gain equivalent benefits, such as greater buyer loyalty during cyclical or seasonal downturns".

THE GENERIC VALUE CHAIN

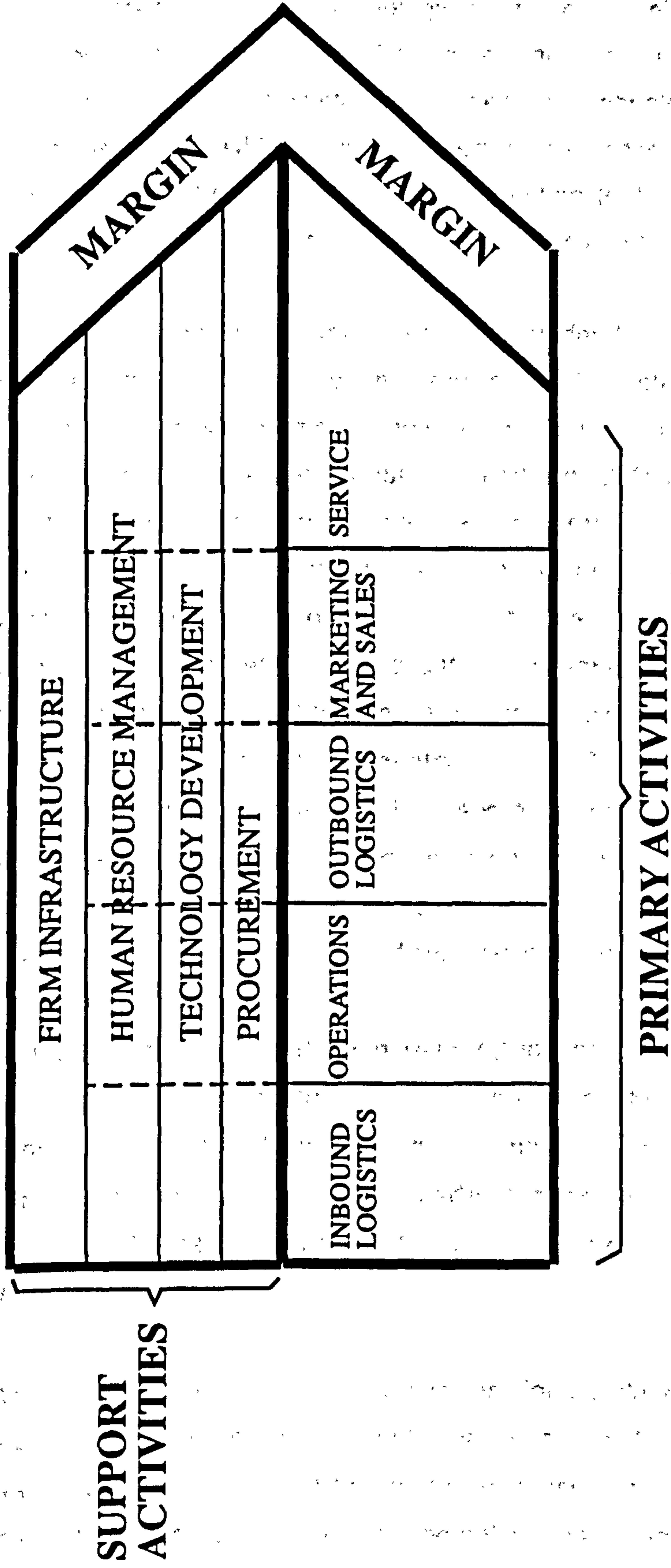


FIGURE 3-1

Source : Porter (85)

(171) The last two of these are particularly relevant to construction consulting especially where differentiation can be achieved through technology transfer.

Porter also covered the role of technology in strategy, dwelling on the technologies to be developed, whether to seek technological leadership and the role of technology licensing. However it is the system or process of technology transfer rather than any specific technology which is investigated in later case studies and this is also further discussed in Chapter 4. It is also interesting that Porter commented that a high level of technology in a business did not necessarily lead to success. (172)

Porter also drew attention to competitive scope under four main areas; "segment" including the product variety, client type etc: "industry" involving activity in more than one industry; "vertical" implying the use of various in-house channels and outlets and "geographic" meaning work in different geographic areas. (173)(174) At an international level, a firm could be described as country orientated in its strategy if many of its value activities were located in any one country and it did not endeavour to coordinate them between countries. A firm conducting overseas business, in one country only, would come into this category. A pure global strategy on the other hand would mean close control of all activities in several countries from a single country base. Consequently coordination of activities could be "high" or "low" and the geographic emphasis could be "dispersed" or "concentrated". In Porter's view this was one factor which gave a dimension to different strategies. A global strategy would involve either a "concentrating configuration or coordination among dispersed activities or both". (175)

In many industries, "limits had been reached in scale economies that had been driving the concentration of activities. Furthermore, the coordination dimension was being assisted by "breathtaking advances in information systems and telecommunication technology"; this made it possible and relatively easy for "engineers in different countries to communicate via computer screens". (176)(177)

Coordination on an international level involved "long distances, language problems, and cultural barriers to communication". In some industries it was better to allow less frequent decision-making at the centre for these reasons. A firm might decide to "concentrate" some activities and "disperse" others. Competitive advantage grew

out of where a firm performed its activities. It might seek to obtain competitive advantage throughout its value chain or that of its clients or suppliers. Global competitors could "spread activities among locations to reflect preferred locations for different activities". How these were carried out were just as important as where they were done. Porter defined some countries as "global platforms": i.e. those countries which allowed firms a special environment in competing internationally from their shores. (178)(179) The characteristics of a country's demand and the needs generated by particular problems which individual industries might have been called upon to face were a further aspect of the global platform. Again better coordination between and across countries had been facilitated by "falling communication costs and reduced travel times for individuals"; also there had been increased similarities in "marketing systems, business practices and infrastructure", which made this even more possible. (180)

Further Aspects of Planning

Strategic planning, as applied to multinational corporations, was seen by Chakravarthy and Perlmutter (181) as having three important "textual" factors: "economic" factors involved locating the elements of the value chain in the right place; "political" factors involved the demands placed on the firm by host countries and "strategic" factors lay within the firm itself. Even within the same industry, a firm could choose a different strategy; for instance an insurance firm could adopt a global strategy to service its global customers in one segment of its business whereas in another segment the requirement might be country orientated. They agreed with Porter that there was increasing potential for centralisation and coordination. Globalisation of industries was seen to be on the rise with cheaper transportation being a contributing factor. Bargaining power between the multinational firm and the host government centred on "proprietary technology, worldwide market share (economies of scale) and product differentiation" for the firm and on control of "market access and size & attractiveness of the national market" for the host government. Country centred strategies were likely to result if the host country's strength was that much greater than that of the firm. (182)

Strategic "predispositions" have been discussed by Chakravarthy & Perlmutter. (183) These affected the way a firm viewed itself in the international market. Ethnocentric firms made decisions strongly guided by the values and interests of the

parent and polycentric ones adapted the decisions of the firm to suit the cultures of the countries in which they were operating. Regiocentric firms blended the aspirations of the subsidiary and the parent on a limited regional basis while the geocentric variety sought to integrate very different subsidiaries operating in its global networks into one worldwide decision making process. One danger for any of these firms was that its predisposition could be "at odds with the strategy appropriate to its economic or political imperatives". This meant that a firm which was essentially ethnocentric in outlook might not be able to adapt easily to national conditions in a host country; also a global strategy might conflict with the outlook of a polycentric firm. The importance of human resources management was emphasised if a firm was to adapt to the environment and implement the most appropriate strategies. (184)

3.27 STRATEGIES OF SMALLER MULTINATIONALS

According to Adler (185), many smaller multinational firms "had a distinct technological lead or competence in a particular field", which helped them to compete with much larger firms. Like Porter, Adler maintained that smaller firms could move faster than larger firms. Due to vastly improved communications, it was possible for smaller firms to exercise control over operations in distant parts of the world in a way that they had been unable to do a decade earlier. (186)(187) Mascarenhas (188) compiled strategy groups for non-dominant firms, covering a wide amount of ground across a number of industries for a variety of firms. Various ways in which "follower firms could compete with industry leaders" were suggested. There was a positive suggestion that non-dominant firms would find opportunities in less competitive, even lower technology markets, if they could segment the market to their advantage. This picked up some of the early threads on segmentation discussed by both Cooper & Kleinschmidt and Porter.

Kirplani argued that smaller such firms in the manufacturing sector needed to be treated differently from large multinationals in the sense that they did not need to depend on technological leadership or substantial R & D investment. They could very well compete without these attributes and would likely be successful in the simple or medium-technology product market. In order to do this, however, they needed a "competitive price package with a good promotional effort, backed up by a well-designed information and control system". (189)

In spite of some advantages in terms of light footedness, small international firms were beset by problems not faced by larger firms. "Critical constraints were capital shortage and managerial time; they were also relatively undiversified, privately owned and had functional rather than divisional management structures. Shortage of time also extended to the necessary analysis required for foreign markets; this could complicate the process of working in foreign markets and made the quick response of small firms less of an actual possibility. As a result, political risk and red tape were both often underestimated. (190)

From the point of view of host governments, smaller multinationals presented little threat to sovereignty, although many of the regulations in force considered all firms as full multi-nationals. These enterprises had to take on "foreign markets, foreign governments, foreign politics and foreign customs" in the same way that their bigger brothers did. There was no short cut to managing these external risks; they had to be managed by small and large firms alike. (191) Some of the strategies adopted by professional firms have a different emphasis to that of other firms and these are now discussed.

3.28 STRATEGIES FOR THE PROFESSIONAL SERVICE FIRMS

Consulting Services and Segmentation

Schmenner (192) compiled a service process matrix which showed how some service firms were having to shift their position to accommodate the changing requirements of their clients for greater or lesser interaction which then had to be reflected in the degree of the firm's labour intensity, which was also alluded to in Chapter 1; considerable segmentation and diversification was the result. (See Figure 3-2 (193) and Figure 3-3 (194))

Wittreich made an early analysis of professional services strategy. He emphasised three key concepts: the service had to minimise the client's uncertainty, it had to provide understanding on the nature of the problem and it also had to be fully capable of carrying out the service. Most clients making the decision on the inclusion of a service firm in a project prefer to "be courted by those persons actually performing the services". (195) Bloom considered that those who are more involved with the "doing" of the service within the firm, whether accountant,

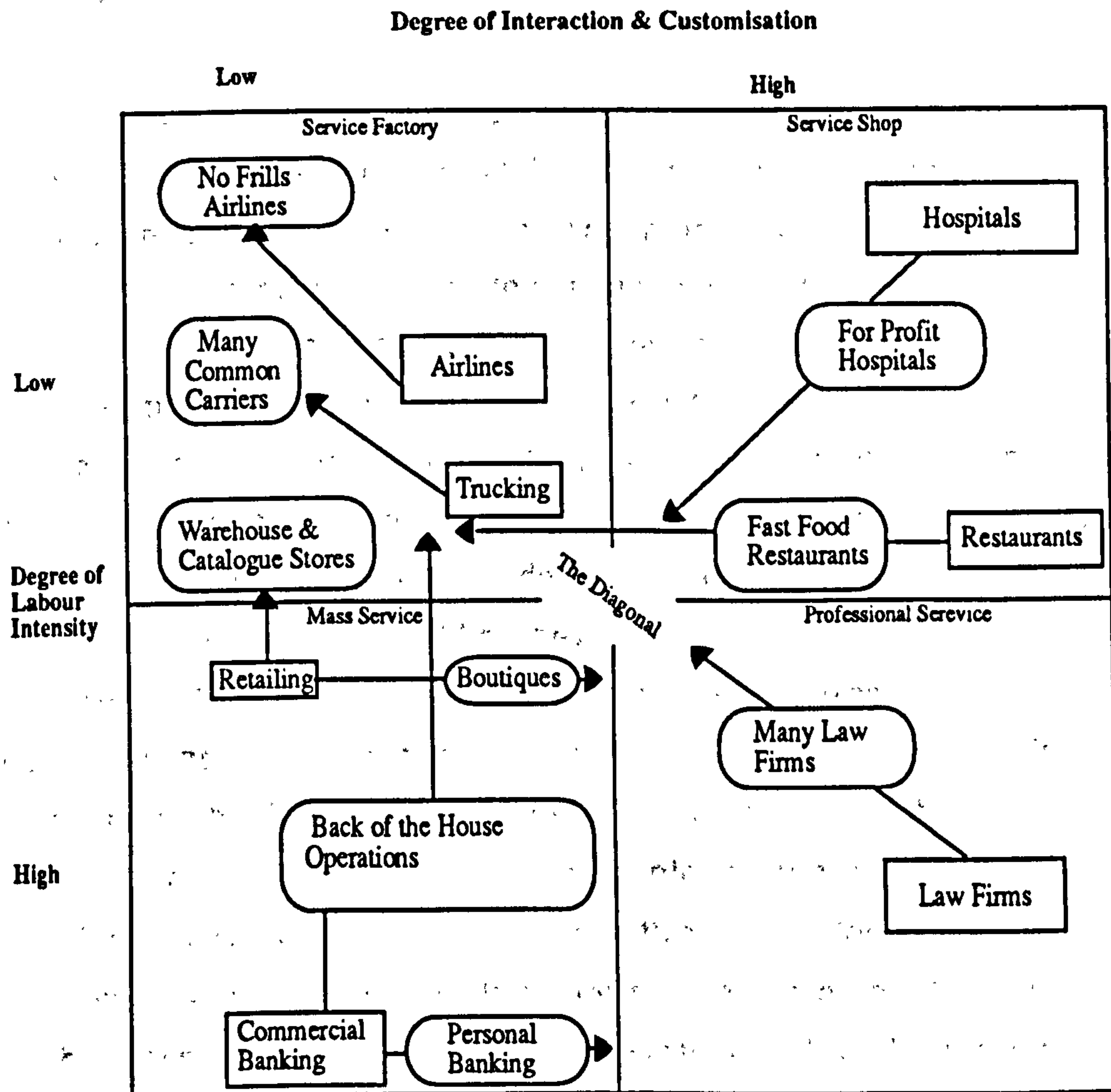
THE SERVICE PROCESS MATRIX

		Degree of Interaction or Customisation	
		Low	High
Degree of Labour Intensity	Low	SERVICE FACTORY: <ul style="list-style-type: none"> - Airlines - Trucking - Hotels - Resorts & Recreation 	SERVICE SHOP: <ul style="list-style-type: none"> - Hospitals - Auto Repair - Other Repair Services
	High	MASS SERVICE: <ul style="list-style-type: none"> - Retailing - Wholesaling - Schools - Retail Aspects of Commonwealth Banking 	PROFESSIONAL SERVICES <ul style="list-style-type: none"> - Doctors - Lawyers - Accountants - Architects

Source : Schmenner (86)

FIGURE 3-2

STRATEGIC OPERATIONS CHANGES WITHIN THE SERVICE PROCESS MATRIX



TRADITIONAL OPERATIONS

OPERATION CHANGE

Source : Schmenner (86)

FIGURE 3-3

engineer or lawyer can find the act of selling (the service) to be "too commercial, even too demeaning and at times too difficult". The reliance on individuals with a flair for promotion of new business may not necessarily succeed in the long term, which can create problems for the proper establishment of a distinct and separate marketing function. (196)

Bloom noted that when clients are uncertain they often concentrate on whether the firm "has carried out the service before" (197); they can also rely on certain other signalling criteria such as; reputation, appearance & size of facilities, time in business, lists of clients, visibility of top management etc. (198) "Firms with expertise in limited areas often have difficulty diversifying into new lines of work and inexperienced professionals seldom find it easy to obtain substantial work at all. Newness in the professions is not nearly as favourable an attribute as it might be for a soft drink company or airline", for instance. (199) In order to counteract such conservatism in clients, many firms decide to concentrate on specialisation "by offering a limited set of services (that they have provided many times before) to a limited market". Alternatively to overcome this need for experience a firm can "recruit people with the needed experience, merge or join forces with a firm that has the experience in the field or reduce fees". The problem with the latter is that the perception of the client is of a firm offering inferior quality. Nonetheless, it can be useful for new firms to build up business this way or for established firms to extend into new markets. However, there are several more specific approaches to consulting business which can help a firm to position itself in the market. (200)

Consulting Staff Orientation to Suit Project Types

Professional service firms generate revenues by successful leverage of their low-cost junior and high-cost senior staff. As the pressures for salary rises occur, particularly from middle level professionals, some firms may lose key-staff continually yet be able to continue doing business because of the combinations that can be put together of senior and fast-learning junior staff. According to the projects sought or undertaken, a firm will have to balance its staff inputs. "Brains", "Grey-hairs" and "Procedures" projects will all differ. (201)(202)

"Brains" projects rely on providing staff with many years of experience of a particular type of work. On "Procedure" projects, the firm may simply be selling

its availability and efficiency as well as being able to carry out the project along well-trying procedural lines. There is a strong element of the one-off in a "Brains" project and a considerable portion of routinisation in the "Procedure" project. (203)(204) Each of these are variations of firm specific ownership advantages described earlier under the eclectic theory. As Boddewyn noted a reservoir of management expertise would enable a firm to put together different combinations of staff resources according to client needs.

The success of the professional service firm comes in correctly balancing the type of projects it undertakes with the correct cost mix of staff that it can allocate to the task. The firm also has to learn to change the composition of its team structure to match the current situation. Projects that in the past had been treated as having "Brains" or "Grey-hairs" characteristics may well be accomplished in the present as "Procedure" projects. (205)(206)

Gardborn & Rhenman (207) reckoned that some projects had certain characteristics that made for a longer term contact with their clients. The type of project that firms undertook therefore in certain situations could determine the depths of relationship possible with their clients. In other words some projects had certain characteristics that made for a secure establishment in the host country whereas others were likely to lead to temporary appearances followed by withdrawal. The resources that the firm allocated to developing these two separate kinds of projects could therefore be different. How far this is true for technology transfer projects is investigated later.

The section on internationalisation, appearing earlier in this chapter, has already hinted that supplying home products, which are surplus to capacity, can be a source of rigidity in the firm. (208) While it may seem attractive to carry out repeat projects and similar types of engagements which seem appealing on unit cost grounds, a firm has to maintain challenge for its own professional staff as well as staying competitive in the kind of project range it has selected for itself. (209) Maintaining competitive edge is often best achieved by stretching the firm on new and onerous projects.

The Business Idea of a Consulting Firm

Gardborn and Rhenman also spoke of the "business idea" of a company; often this arose in response to some genuine problem. They identified four different kinds of business idea in professional firms: "Specialist" firms concentrated on branches of the industry where clients wanted expertise in limited areas. "Multi-specialist" firms offered a greater range of expertise. "Product orientated" firms concentrated on meeting the demands of a particular section. The "problem-solver" firm addressed themselves, not to certain sectors but to certain classes of original problem, however difficult. (210)

It was noted that many firms were not necessarily based strictly on a single business idea. In the "multi-specialist" and "product-orientated" type of business, dangers were seen in offering too much of a systematised approach; professional performance might not be regenerated in the process yet there had to be a high dependence on the technical skill of the individuals within these groups.

Client Technologies and Consulting Firms

Coxe (211) also examined various professional firms' strategies. He split engineering and architectural firms into three categories of design technology, related to the way they set about their business. These were "Strong Delivery", "Strong Service" and "Strong Idea" (see Table 3-4). (212) Seven major areas of the firm were influenced by the choice made by the firm on any one of these design technologies. These were the project operating process, the location of the project decision making, the staffing at middle and lower layers, the actual product sold, the selection of the best markets, the things that the firm could change and finally the strategies it should adopt for the healthiest profits.

Although a firm might position itself comfortably in any one of these groupings, it also had to be alive to the requirements of the market. Table 3-5 (213) shows how the needs of one decade might not be the needs of another. It also indicates how a firm could limit its own competition by knowing in advance what the needs of the market might be and then adapting itself to suit it if it possibly could. It might not

CATEGORIES OF DESIGN TECHNOLOGIES

"Strong DELIVERY" firms

Highly efficient service on similar assignments - often to clients seeking more of a product than a service
 Highly reliable professional quality with the best of prior solutions offered many times over

"Strong SERVICE" firms

Experienced handling of complex assignments
 Ability to deal with conditions changing significantly from one project to another
 Emphasis on the management process with coordinated comprehensive inputs, often multidisciplinary

"Strong IDEA" firms

Singular expertise, innovation (or both) on projects of a unique nature
 Flexible approach according to the task on hand, often based on the style of the firm's leader

Source : Adapted from Coxe (87)

TABLE 3-4

CHANGES IN MARKET DEMAND FOR ARCHITECTURE AND ENGINEERING TECHNOLOGIES OVER THREE DECADES

MARKET EVOLUTION

DESIGN TECHNOLOGIES	1960 s	1970 s	1980 s
Strong delivery	50 - 60 %	35 - 45 %	35 - 45%
Strong service	40 - 50 %	50 - 60 %	35 - 45%
Strong Idea	1 - 3 %	3 - 5 %	10 - 15 %

Source : Coxe (87)

TABLE 3-5

pay a firm to stay in the "strong delivery" category if the needs of the market were moving rapidly in another direction, say into the "strong idea" segment. (214)

Business Centred Practices and Practice Centred Businesses

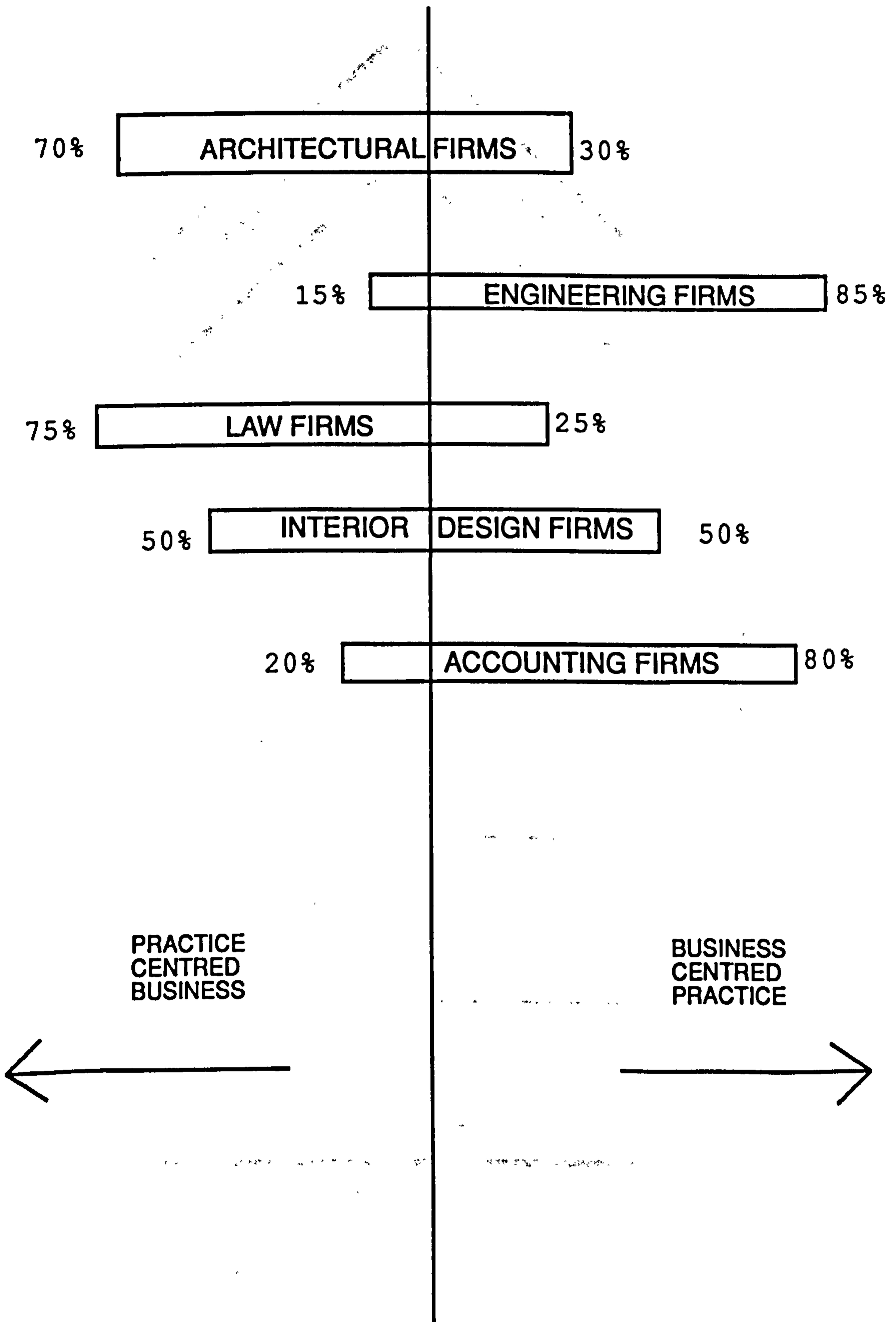
Coxe pointed out that consulting firms were either orientated towards a "Business Centred" practice or a "Practice Centred" business. "Practice" was defined as "the carrying on or exercise of a profession or occupation ... as a way of life" while "Business" was "a commercial or mercantile activity customarily engaged in as a means of livelihood". (215) Figure 3-4 (216) shows Coxe's continuum for different professional groupings. This shows that Architectural and Law firms tend to be in the former category while Engineering and Accountants tend to be in the latter. While this was somewhat generalised, it increases the understanding of the way that many professional engineering firms approach their business. Practice-Centred businesses and Business-Centred practices organised themselves very differently; the two approaches are contrasted in Table 3-6. (217) Coxe then drew up profiles for six different firm groupings combining type of practice with type of design technology. It was clear that professional firms could come into any one of these six profile categories, depending on how they organised themselves and depending on the market and clients they served. (218)

3.29 Application to Construction Consulting

While few construction consulting firms appear to optimise their activities on a global scale, there is sufficient interchange that the large firms can be called more than international in nature, with some of them beginning to operate in a global fashion. Because of a relative lack of truly global companies within the consulting engineering industry, however, it may not be possible to apply many of the wider aspects of Porter and Chakravarthy & Perlmutter's arguments, although some have a particular bearing.

Based on the activities of a consulting firm described in Chapter 1, the likely value chain for the consulting firm is shown in Figure 3-5. The supply of technology transfer at the primary downstream end of construction consulting firms' activity

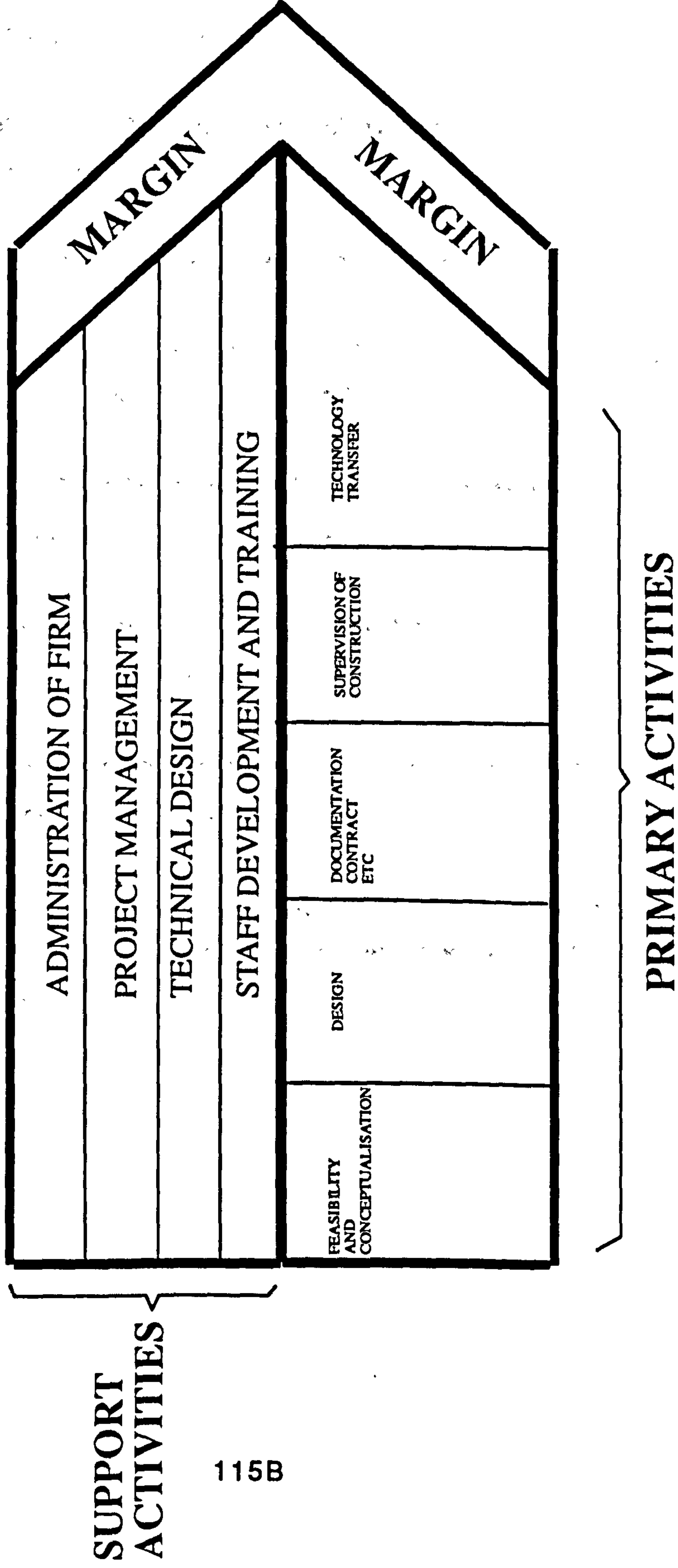
HOW DIFFERENT PROFESSIONS GROUP ON THE CONTINUUM



Source : Coxe (87)

FIGURE 3-4

POSSIBLE VALUE CHAIN FOR CONSULTING FIRM



115B

Source : Author

FIGURE 3-5

"PRACTICE CENTRED BUSINESS versus BUSINESS CENTRED PRACTICE"

STRUCTURE OF FIRM: partnerships or incorporated with directors

DECISION-MAKING: on consensus or hierarchical/directive basis

PLANNING: minimal, with opportunities followed as they arise, or planned goals & objectives

MARKETING: broadly participative or centrally directed

INVOLVEMENT WITH CLIENT: personal attention from firm's senior professionals or delegation to the most suitable layer in the firm's organisation

PROMOTION OF STAFF: from within based on maximum experience or staff obtained as the project requires

PROFIT: measured on the basis of the most value given to the client or on the basis of the firm's efficiency

FOCUS: on professional quality mostly long term or on efficient administration of a project with less long term objectives

POTENTIAL REWARDS: qualitative (eg how did the project seem to come out, on reflection?) or quantitative (eg how did we do on the project in terms of profit?)

Source : Adapted from Coxe (87)

TABLE 3-6

can be a source of differentiation of the service offered. The client in developing countries may see this as a considerable benefit in meeting the long term guidelines of self sufficiency as expressed in many of its governments long term policy objectives, which were discussed in the opening chapter. A consulting firm's strategy could therefore be "focussed through differentiation" via the technology transfer mechanism in its projects.

There are also concepts of the global platform which could have direct relevance; for instance many consulting firms work out of Singapore in order to reach other parts of Asia. Both Porter and Perlmutter drew attention to the value of a country and regionally orientated strategy. Many medium sized consulting firms have opted for a regional approach as evidenced by their offices with the smaller firms having to decide to concentrate on one or two countries. The larger ones must think to what extent they must concentrate their production activities or disperse them throughout a wider network. In spite of their past colonial excursions, British consulting firms seem to have remained largely ethnocentric but it is an open question how many of the larger ones are assimilating national personnel into their subsidiary offices, as they engage in joint ventures and know-how transfer with local firms, and move towards a measure of polycentrism or regiocentrism.

Where construction consulting firms are small to medium-sized and non-dominant, they are likely to have the advantages of flexibility and be able to benefit from improved communications. Some of these offer specialisms such as marine works, power stations or even temporary works design, which enable them to work in a niche area and become well-known worldwide. Some of the larger consulting firms have been hiving off their operations into fully autonomous specialist units to compete in the same way. As regards host governments, all sizes of construction consulting firms may well be surprised at how they are treated since they may be lumped in with more powerful multinationals, which they are not. This is one reason why many consulting firms seek the cooperation of a local firm, to help in the negotiation process.

Drawing upon the professional firm strategy theory, various consulting engineering firms are now leaning towards more formal business development functions; the way this is organised varies according to the firm itself and according to the firm's size. How a firm markets itself in construction consulting

usually must depend on convincing the client of the quality of its staff and past record. Firms need to be careful not to dilute their expertise by taking on work, which is too mundane or straightforward.

Different projects may be expected to make different demands on firms, as indicated by Bloom. For instance some motorway work requires an ability on the part of the consulting engineer to produce designs which meet the requirements of all the necessary codes of practice, also to interface with the client who would be a public body not particularly interested in the personal touch of the firm's leader etc. Such a firm would have to be strong on procedural approach and would come into the category of the "Strong Delivery" or "Strong Service" centred practice. Straightforward work and projects requiring considerable creativity and innovation would draw upon the "Strong Delivery" and the "Strong Idea" approaches. If a firm becomes involved in carrying out technology transfer projects overseas, it may find that it is necessary to become a particular type of "delivery", "service" or "idea" firm according to the task on hand.

Part of the purpose of Coxe's work was to alert firms to the possibilities of "superpositioning" their firms to suit new trends in the market. In doing so it can often be useful to make an assessment of the strengths and weaknesses of a firm in the sector. (This is discussed further in Chapter 5). Each firm needs to perceive how clients in the market might be changing and align itself accordingly; alternatively it might seek to lead the market and draw clients into different perceptions of how they should tackle their own projects.

Coxe's "strong delivery" firm mirrored the "procedure" project of Bloom and the "product orientated" firm of Gardborn & Rhenman. The "strong idea" firm and also, to some extent, the "strong service" firm had many similarities with the "problem solver" firm or "brains" type of project. However comparisons can become overstretched; Coxe was seeking to emphasise a strategy at the level of the service given, while Gardborn & Rhenman were seeing it more from the angle of the project undertaken with Bloom concentrating on the staff inputs.

All these approaches show that consulting business in construction is not a single homogeneous lump to be tackled by firms with a single approach for any occasion. Considerable segmentation and diversification are needed along the lines described.

These principles can be applied to the domestic scene and the international one with equal facility but, in the international market because of the greater competition, it can be more crucial to success. Many consulting engineers have positioned themselves as "practice centred" businesses but the international market is increasingly driving many of them to become more business oriented, which can be expected to involve considerable change and upheaval.

At the same time it can be necessary to become involved with training overseas which is not required of them in the home market; this may be where further segmentation can be developed of their business, that is through the provision of certain types of technology transfer packages. The manner in which such projects are conducted may differentiate them from other firms and construction groups in the industry. This theme is further developed in Chapter 4, when the subject of technology transfer is discussed in much greater detail.

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CHAPTER 4 TECHNOLOGY TRANSFER

SUMMARY OF CHAPTER 4

- 1. Technology transfer definitions can vary according to the organisation using the term. Such technology transferred has to be adaptable to the environment. Labour & capital intensive methods and cultural aspects all need consideration. Technology transfer can occur via an "expert based" route using individuals or an "organisational" route where the exchange is carried out in conjunction with an incoming foreign firm.**
- 2. In construction consulting, technology transfer usually consists of technology plus an element of know-how, the latter relating to management & organisation and the passing on of experience. "Appropriate" technology is not what is sought by most host country clients. The format of technology transfer can vary with training occurring in the local subsidiary, on the project or in head office etc; courses, counterpart training and other kinds of supervision can all be used.**
- 3. Technology transfer requires a willingness to learn and time for assimilation. Financial provision for technology transfer may best be separated from the financing of the project stage itself.**
- 4. Technology transfer ultimately should lead to self-sufficiency for local firms who are able to bid successfully on aided international projects but the evolution of a strong local firm can take many years.**
- 5. Local firms do not always receive very meaningful transfer and staff in these firms do not always benefit sufficiently. Sometimes it is the incoming firm's staff who gain most by improvement of their own staffs' experience and know-how. Some host countries are insufficiently timely or circumspect in the allocation of their staff to technology transfer. There can be various on-the-ground problems in setting up technology transfer projects. Age and experience are not always easily matched. Sometimes host countries lose their trained staff abroad.**
- 6. Some consulting firms regard technology transfer with suspicion because it may lead to the undermining of their own prospects of future work. Some subconsult this sort of work. There may be long term benefit when clients come to depend upon the consulting firm. Technology transfer might be seen**

as part of a long term strategy for firms if their clients are at ease with such long term relationships.

After introducing some of the long term objectives of technology transfer in Chapter 1, and alluding to the process of technology transfer on frequent occasions in earlier chapters, it is time to define the term itself, its nature and implications. This chapter seeks to establish its context in the world at large, but particularly in developing countries, and how it manifests itself in construction consulting. This provides a vital link to the hypotheses and cases which appear in Chapters 6 and 7.

4.1 TECHNOLOGY TRANSFER IN THE WORLD CONTEXT

Definitions and Nature of Technology Transfer

The Oxford dictionary defines technology as the "science of the industrial arts and ethnological development of the arts". (1) A user of technology was defined as: "one that embraces the notion of combining the mechanical aspects of application of energy to matter with the sociological act of doing so through continuously employing a store of acquired knowledge". (2)

In Contractor's view, technology transfer had to be viewed as "a relationship rather than an act", except in the case of turnkey contracts where the exchange was more impersonal and shortlived. (3) Some host country organisations who obtained only technical documentation and patents from supplier firms found very soon afterwards that they needed also to "enter into technical assistance agreements with the original supplier who (then) sent engineers and other production personnel for extended periods of time". (4) On other occasions firms were able to purchase the bare technology on its own if they had already assimilated enough of the supplier firm's products and methods to cope but it was more usual to find organisational and management assistance included. Several United Nation's studies in many countries had shown that "the vast majority of cases involved a mix of information in documentation and hardware, production and marketing rights in the transfer of patents and trademarks, and training services involving the transfer of human capital". (5) The transfer of firm specific technology was more expensive and tended to occur where the recipient firm was technologically inferior. In such a situation, it may also have meant that personnel in the firm had to become

"involved in the technical education business". According to Rodrigues, the term technology generally meant "machinery, equipment, products, patents, licenses, trademarks, blueprints, process designs, and other techniques such as marketing and advertising, accountancy, personnel management and general management. Technology transfer was the application of technology to a new use or user". (6)

Technology's Appropriateness for Developing Countries

Technology has been exported for aggressive reasons of expansion into new markets and also for defensive reasons when product demand has fallen away at home. The willingness to extend the home product overseas has been discussed under the earlier internationalisation section. It has generally been held (and the economic theory literature would support this view) that the transfer of technology to a less developed country would hasten that country's economic development, although Schumacher (7) chose to differ on the value of such transfers because they were in his view too often inappropriate; he advocated more labour intensive methods, since there was invariably labour in abundance in developing countries rather than an overdependence on capital intensive techniques. (8)(9) Any transfer between developed and developing countries called for caution since the socio-economic conditions could vary sharply. In spite of this, some very high-tech methods had proved their worth in developing countries, simple examples of which were resource surveys via satellites, land surveying using lasers etc. (10)

Contrary to expectations inappropriate technology was invariably used even when there were more suitable alternatives available. More expensive capital intensive processes were selected because developing country managers "wanted to associate themselves with technologies considered to be at the world's forefront and governments wanted showcase plants as indicators of their countries' modernisation". (11)

On the other side of the coin and further towards Schumacher's (12) plea for technology that was appropriate, Mordell highlighted the adaptability required in developing country engineers. A high degree of competence was needed to "see how a well established possibly even a mundane technology, applying in a more developed country, could be altered to suit a very different environment (in every sense of the word including climate, technical infrastructure, quality of labour, availability

of spare parts etc.) in a developing country. In any of these countries there could be a near total lack of engineering back-up; several disciplines needed to be covered at once and extra responsibilities of administration often came far more quickly (upon staff) than would be the case in the developed world, where it was more usual to receive a professional grounding over a longer period of time. (13)

Cultural Implications

The cultural implications of technology transfer and their effects on developing countries were investigated by Hill, who concluded that any impact from technology had also to be attributed to some of the other agents of industrialisation. (14)

Shrivastra also commented that "since technology was so inextricably integrated with the social and cultural lives of people technological innovation had to be viewed as including changes in elements of the social relationships of production, traditions and cultural norms". In introducing innovation, most of the time developing countries also required new types of knowledge, managerial skills and organisational systems. (15)

There was a need for a good understanding of local business cultures, on the part of a developed nation, for transfer even to begin to be successful and it was essentially a two-way business. (16) Many developing countries had managers who were finding difficulty in actually identifying the right technologies for their own situations; such managers also needed a greater understanding in implementing these technologies. Really effective transfer implied that managers had a proper understanding of behavioural approaches to problem solving. (17) Technology was transferred most rapidly where the innovating developed country firm was technologically dominant compared to local host country firms. (18) As was shown earlier, a foreign incoming firm must have some compensating advantage in order to trade in the host country.

Routes for Technology Transfer

Some of Sharma's work was discussed earlier under the section on management contracts in Chapter 3. In a wider technology transfer context, he noted that international transfer of technology took place through two main routes: the

"expert based" route and the "organisational route". Both routes required direct or indirect participation of people for the transfer to be a success. (19)

Under the "expert based" route, experts were usually brought in on an individual basis by the firm, for three main reasons, to procure technology on a part of the project only, to avoid the limitations of one specific system or to obviate the need for a long term relationship with a particular firm. Complex technology transfer would not be likely to occur through the individual route. However the individual could be counted on to exercise less control than an organisation would but an individual could sometimes be more footloose, which might cause continuity problems for the recipient firm. (20) One of the later case studies covers client organisations where individual experts were brought in (from a construction consulting background) to run these organisations at the same time providing technology transfer services.

The "organisational" route involved the transfer of the donating firm's employees to the recipient firm; technical data would also accompany them. Traffic was not only one way because "people from the technology recipient firm were also placed in the organisation of the technology transferring firm for a limited duration to learn the various skills and technology". (21) Those who were sent abroad tended to be at the more senior end of the staff spectrum; lower levels were more likely to be trained in the host country. When equipment was supplied, along with accompanying support services, there was a further opportunity for technology transfer whenever attempts were made to sort out the snags that might occur. (22) Some space is given later to a case on capital goods manufacturers and equipment suppliers' view of technology transfer. Most of the cases concentrate in the main on the "organisational" route adopted by construction consulting firms.

The next few sections review the direct experience of the international construction consulting sector of technology transfer; much is drawn from international conferences, attended by developed and developing country consulting firms as well as aid agencies. This helps to flesh out more of the details of consulting firms activities for host country clients in the area of technology transfer.

4.2 TECHNOLOGY TRANSFER IN CONSTRUCTION CONSULTING

Definitions of Technology Transfer in Construction Consulting

In civil engineering projects, there has been a need for both high level sophisticated technology associated with design and also lower level transfer for the improvement of construction capability. (23) Binger summed up the technology to be transferred for construction consulting as "the capability to plan and organise the investigation, design and execution of a project.. rather than a sophisticated process know-how". (24) According to some authors, the creation of teams of joint ventures would achieve this transfer most easily. (25) Joint ventures have already been shown to play a significant part in consulting firms' internationalisation.

Eldridge, among others, preferred to describe technology transfer as transfer of know-how, which implied both an exchange of knowledge and a passing on of experience. (26)(27)(28) For transfer to be effective the mere inclusion, in a contract, of an intention to transfer technology was clearly insufficient. Instead, a highly structured system of transfer had to be specified; there had to be a good match between the know-how imparted and the capability of the individual, and also a framework of role definition for all parties. (29) Sometimes the perceptions of technology transfer varied according to whether it was the recipient, the donor or the sponsoring agency, who was involved so that it is not surprising that even at the definition stage the wording can become confused. (30)

Appropriate Technology in Construction Consulting

There has been some debate over the question of the applicability of appropriate technology in construction. "Appropriate technology" was not what was sought by most developing countries in the majority of cases; (often it had come to mean the "maximum use of hand-labour intensive methods"). The reason for this was that in civil works it usually led to works which were "slow, expensive and liable to be inferior in quality". Sometimes such methods worked out satisfactorily, for example on the rural access roads in Kenya and Lesotho. (31)

Coukis (32) gave four main reasons for rejection of appropriate technology methods; firstly they were not efficient; secondly they offended the political and technical "elite" leadership of the country, who felt they were going "backwards" and "smelled of an old colonialism"; thirdly they were more management intensive in a "handling of people sense", and the one resource which was so often lacking in the Third World was management; fourthly it was easier to get funds for an equipment based programme because the donors often wanted to push sales of machine exports. Invariably such plant intensive projects had less unknowns because the human factor was less unpredictable and the risks of failure were perceived to be less. (33) When aid funding was discussed in earlier chapters, the emphasis was upon the quantitative nature of aid. Various other aspects of aid projects are illustrated clearly in the later case studies of Chapter 7; one case study centres on technology transfer solely from an aid agency viewpoint.

Routes for Technology Transfer in Construction Consulting

In Abbott's view there were essentially two means of achieving technology transfer in consulting, actually in the host country. One was to set up a local subsidiary and gradually employ more and more staff until local partners and directors were appointed. The second was to use the counterpart training system on projects, working alongside expatriate staff of consulting engineering firms. Of both methods, the former had become less common. (34) Under the latter, the individuals being trained would already be part of a locally owned construction organisation, whether public or private. A third means was the opportunity for working in the home office of the consulting organisation and for attending specialised courses at universities overseas. (35)

Starr gave a thorough overview of technology and know-how transfer in construction. There were different training programmes in use: on-the-job training, individual lectures by specialists, with personal supervision via workshops, short training courses (up to 3 weeks), post graduate courses (6 months - 2 years), and other overseas training. (36) Seminars given at the end of each design stage were a useful and relatively easy means to transfer technology. (37) Starr's perspective was reiterated by Sharma, in the Scandinavian consultant sector. (38)

Short courses within the host country gave provision for a wider number of people to be drawn in who could not otherwise be accommodated because of limited space. Overseas training was seen as a very expensive route. Consequently an overseas qualification could also be a "passport to a job abroad and was much sought after for this reason". (39)

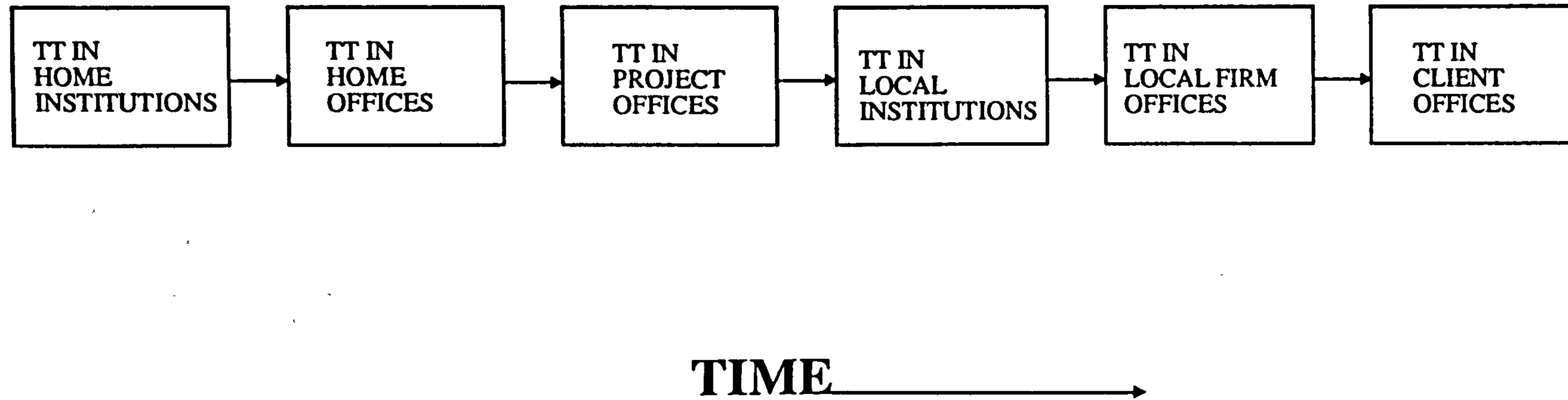
On-the-job training involved participation alongside the consultant's expatriate staff with explanation of objectives and methods of approach. Regular briefings and occasional lectures would be given as the project progressed. A central part of the process was the individual supervision that was provided. In cases such as this, counterparts were attached to an individual member of the project team and "matching tasks would be assigned, taking into account the personalities, experience, skills and interests of those involved; this could prove a sensitive and difficult matter". (40) The different locations for technology transfer are shown in Figure 4-1. There is a progression indicated in the diagram which may not always be consecutive (i.e. from home office to project office to local firm office to client office etc.) but all the main routes are shown. (Figure 5-1 also shows how technology transfer might be tied into the stages of internationalisation, which also expands on Figure 1-5).

4.3 COMMITMENT TO TECHNOLOGY TRANSFER IN CONSTRUCTION CONSULTING

The Need for Commitment to Technology Transfer

Dickerson (speaking at the end of the seventies as a representative of the World Bank with direct responsibility for Consultant Services) considered that while there was general agreement that there was a need for technology transfer there was less agreement on what actual content should be transferred and which avenues might be used. Joint ventures of developed country consulting firms in collaboration with their opposite numbers in developed countries was seen as an "ideal route for this". The transfer had to be planned, the progress measured and the success or failure evaluated. (41) Furthermore "the transfer of skills from firm to firm required a willingness to learn, and time". (42) Joint ventures with the local firm have already been discussed in Chapter 1 and 3 under the heading of internationalisation.

POSSIBLE PROGRESSION OF LOCATION OF TECHNOLOGY TRANSFER IN INTERNATIONALISATION OF CONSULTING FIRM



132A

Note:
TT continues to occur in all offices
as internationalisation progresses

SOURCE : Author

FIGURE 4-1

Ibrahim (of the Kuwait Fund) emphasised that governments had to be forced by their people to work for the proper implementation of technology transfer and the funding agencies had to push these governments through their loan agreements; otherwise "technology transfer would continue to remain an academic issue". (43)

Separate Financing of Technology Transfer

At the end of the seventies, there appeared to be some conflict in the policy of the World bank in its "desire for transfer of technology and what appeared to be an encouragement of price as an element in the competition for and the selection of consulting services". (44) According to Hajj, training should be a function separate from other services with proper compensation being provided for this work and a preparedness not to expect over-rapid results (45) Ibrahim concurred with this view (from the standpoint of the Kuwait Fund) by noting that "loan agreements should have separate provision for on-the-job and other project training". (46)

In host country client's minds, considerable conflict arose by expecting consultants to carry out a transfer of technology at the same time as they were working on projects. The pressure to complete within the constraints of time, and quality, and also make a profit meant that technology transfer was too often pushed into the background. In Adejumo's view, governments and official providers of funds had to "discourage competitive bidding by consultants and insist on special funds being provided in addition to the fees payable for normal services to enable consultants to transfer any technology they possessed and felt disposed to transfer". Often the absorption coefficient was low so that the actual net price effectively paid for transfer could actually be very high. (47) A major benefit of separate budgets for training on projects was that "controls could be more easily implemented". (48)

4.4 LOCAL SELF-SUFFICIENCY IN CONSTRUCTION CONSULTING

The Ultimate in Technology Transfer

Binger considered that the informal means of training were more important than the formal. He commented on the ways that technology transfer took place in South

America (in the sixties and after) when nationals were employed on projects, beginning in a junior capacity and then progressing in time to setting up on their own. As a result his firm "could no longer get a job there in Columbia under any conditions". (49) Hood concurred with this view citing Argentina where in the early seventies, at that particular time, the local staff:expatriate ratio was 3:1, this being largely brought about for political reasons. (50)

One of the largest American consulting engineering firms for many years had a policy of encouraging technology transfer. So great had been the transfer that the recipient developing country firm had been invited to shortlist by the Bank and the original firm had not. This was described as "one valid measure of success".(51) This same firm had successfully entered the market in China by means of joint ventures in association with technology transfer agreements. (52)

Dickerson was of the view that in such large countries as Brazil, Mexico and India practically all consulting work was carried out by domestic (host country) firms, with foreign consultants normally only being required for assignments involving sophisticated technology. Where firms wanted to begin to work overseas, they were advised to build up a solid base first in their home market, then seek support from their own governments, then visit overseas and then joint venture with foreign firms. (53) The importance of the home market base for UK consultants was emphasised earlier in Chapter 2. Dickerson's view also fits in with the progression of firms, indicated earlier under the heading of internationalisation.

Binger considered there were at least three countries in South America who had reached self-sufficiency in consulting services by the late seventies: namely Columbia, Venezuela and Brazil. To a small extent these countries had made efforts to work overseas but had had only limited success. (54)(55) Other lesser countries (in consulting terms) have made appearances in the league table of international consulting firms in the eighties such as Portugal, Yugoslavia, Hungary, Saudi Arabia, Israel, India, Taiwan and Korea, although their total influence still remains much lower than the larger countries (see Figure 2-1). (56)(57)(58)

The Establishment of the Local Consulting Firm

Oyefodunrin related how for many years (throughout the seventies) developed country consultants had submitted a pricing for their services which showed on cost grounds that it was cheaper to carry out the core of the project work in their home offices rather than in West Africa. When it came to receiving any know-how, local consultants found it frustrating to get just a "few hours explanation" of what had demonstrably taken "several months to do". (59)

Aluko considered there had to be a distinction made between indigenous "domestic" firms and just "local" firms. The latter could be local in name only, in that much of the work might be done outside the host country. The evolution of a strong local consulting firm could take anything up to 20 years. In doing this, such a firm had to be able to "retain its experienced staff and generate the experienced staff of the future". (60)

Many consulting firms in developing countries had become little more than "design shops" with insufficient emphasis given to an all-round look at a problem. However, because of lower staff costs, the local firm could obtain work and had some base to build on. As far as international firms were concerned this could present a threat, but a limited one since local firms usually opted for the smaller jobs. In any case, there was a growing preference for consulting in areas of integrated project development which required a diversity of expertise even within a single project and this was being encouraged by the aid agencies worldwide yet it was still beyond the reach of the vast majority of developing consulting firms. In Abbott's view, what technology transfer often did was to provide suitable partners at low cost for joint venture projects when international firms came in to work on large projects. (61)

4.5 COMPLICATIONS IN THE IMPLEMENTATION OF TECHNOLOGY TRANSFER

The Unacceptable Face of Technology Transfer

From the perspective of an established local consulting firm in Nigeria, Adejumo saw very little transfer as having come from consulting firms; in fact in his view

some firms had virtually "none to transfer", although they were carrying out projects in developing countries. (62) There was objection from the local engineering community to the policy of employing only younger local staff because this was seen as obstructing the rapid transfer of technology to the middle professional grouping who would then more quickly be able to set up in competition.

Al Shehabi, as a Saudi Arabian consultant, saw very little in the way of voluntary technology transfer. He doubted whether many international firms were of a mind to "cut their own throats" by developing or helping to develop efficient consulting in the developing world. For this reason many of them preferred to deal with an agent who took a commission and then disappeared. (63) The chances of meaningful technology transfer to such organisations was not good. (64)(65)

Dajani, of the Abu Dhabi Fund for Economic Development, had noted the quasi-enthusiasm that consultants often gave to training of host country nationals which regularly made them "relegate the task to sub-consultants, who themselves did not have the proper experience and incentive" to do the task. Training programmes were often lacking in the definition of clear objectives and inadequate monitoring, follow-up and evaluation". Instead of real technology transfer on the part of consultants, what took place, in some places, was "reverse technology transfer", which meant that consultants' work in developing countries contributed to improving the experience and know-how of their own technical staff and strengthening their own institutions rather than "the other way round". (66)

Furthermore, the transfer of technology had its costs, which had to be paid for by somebody whether directly or indirectly; this would be the developed country firm, the developing country firm, the host government or the aid agency. (67) Most developing countries were not strong enough economically to pay the price themselves for realistic transfer and, even when they did, there was always the possibility, in Adejumo's words that "they were being sold an obsolete technology, which was out of date and which professional salesmen were hawking around Third World countries". (68) El-Helw of the Arab Fund noted that where counterpart staff were involved on projects there was generally a lack of satisfactory communication due to "limited information and knowledge being conveyed to counterpart personnel". The level of instruction, the location of training and the follow-up were not always adequately orchestrated. (69)

Client Attitudes Affecting Technology Transfer

Although consulting engineers might have thought they could make a major contribution in choosing the right host country staff for training, by interviewing staff beforehand and selecting those who seemed best motivated to work alongside them on a project, this rarely happened "because many governments actually wished to nominate individuals for the posts", with little consultation with the overseas firm. (70) From the borrower's side, it was important to select staff and allow them to benefit from know-how exchange over a complete period and then allow them opportunities to apply what they had learnt. (71) The aid funds introduced in earlier Chapter 1 and 2 were usually given on a government to government basis to support countries' own development plans and a certain amount of local discretion was thus to be expected.

Aluko referred to some of the contradictions that could appear when host country governments supposedly put their weight behind technology transfer in their own ministries. One was a practice of looking around for a local firm to be linked for the transfer, only after the contract had been let to the incoming firm. A second was the inability when the time came to supply the actual officers, from the appropriate ministries who needed it most, because of understaffing. (72) The place of the agent or local consulting firm was discussed under the theme of internationalisation in earlier Chapters 1 and 3; some of the difficulties of a meaningful link-up are more fully discussed in Chapter 5.

Hajj, of the Arab Fund, noted a similar pattern in his jurisdiction, where the "client did not provide staff sufficiently early on the assignment and then later withdrew them". (73) Some problems could arise where the counterpart staff appointed by the client gave the appearance of not being committed and of not being sufficiently qualified. (74) The effects of training were seen as "very difficult to measure" particularly as they depended on so many factors "outside the consultant's control and possibly quite outside the control of the client because governments of countries had such a large effect upon wages, living conditions etc".(75) Pargal was of the view that while techniques could be learnt, management had to be "that of the host country's environment". After several cooperations with different international firms, his Indian firm had concluded that it was "almost impossible

for overseas organisations to pass on their management culture. The firm's own standards, own designs and own way of managing projects had to be evolved". (76)

Various On-the-ground Problems

Where training took place in the head office of the home country, it was also important to have a clear idea of what was going to take place, otherwise they "could just be on a vacation and not show up much of the time". (77)

Some of the short-fall in expertise in the construction sector of developing countries was due to the fact that "young engineers were too soon drawn into administrative tasks" (78) and this prevented any technical depth being achieved. Further problems for the international consulting firm derived from clients' over-emphasis on curriculum vitae and insistence that "selected or proposed staff be kept available for projects sometimes for unreasonable or unrealistic periods of time". (79)

Where projects involved a non-integrated joint venture, they were often organised so that each party undertook a particular part of a project. Eldridge pointed out however that "this was not a very effective way of transferring know-how" because a foreign firm would have a "review role" only over that part of the project that was done by the local firm. Very probably there would be no involvement either in the policy decisions affecting the project as a whole. (80)

With the integrated firm approach, things would be organised differently. Here staff from both parties would become spread throughout the venture with in-line responsibility being taken by selected staff from either party; usually the lead firm would provide the project manager and some other key personnel but not necessarily all. Progress was probably slower using this arrangement so the body funding the project had to be understanding in the knowledge that know-how transfer was taking place, even though it was hard to quantify the exact costs of this process. (81) The advisability of using a non-integrated or integrated joint venture is addressed in the later cases of Chapter 7.

Age and Experience

Wangsadinata (82) and Kulasinghe (from Indonesian and Sri Lankan perspectives) believed there was no substitute for direct experience. "The longer a consultant had worked in his profession, the more experience he had gathered in an ever increasing variety of assignments, the more depth his considered judgement and the more competent he had become. Degree of competence was commensurate with number of years worked". (83) This grey-hairs syndrome was prevalent in a lot of host government attitude to incoming consultants; this approach was reflected in some of the connotations of professional strategy as designated by Maister & Bloom in Chapter 3. With a background from Iraq and a practice in Eire, Bunni stressed the need to grow through the ranks to become a fully-fledged consultant; it was a long process and there were no short cuts. (84) Only by accessing this kind of experience was it possible for a local firm to prevent itself from dropping down to the midi-market of construction projects. Without it the maxi-market would go to foreign firms exclusively. (85)

The question of the age of staff who were passing on the know-how was seen as important. According to Eldridge they had ideally to be "a little older, but not much older, than those who were being trained". This kind of arrangement was most likely to achieve the best effect, partly because the whole process tended then to move to a more informal level. On the other hand, governments tended to prefer "senior personnel with impressive curricula vitae", but these were not always the most patient or indeed able in terms of computer related technology. For effective transfer to the recipient, it was important to ensure that any host country staff had the right educational calibre and preferably had incentives built into the transfer scheme such as "an increased salary or better career prospects upon successful completion". (86) In many countries, such as in Asia, respect for senior years made it more difficult to contemplate the use of younger staff. (87) Binger certainly saw the wisdom of using men in their mid-career stage. He advised that clients should weight the "advantage of 30 years experience against the greater openness and greater willingness of the younger people" to communicate transfer of technology informally. (88)

Brain Drain from Host Countries

One drain on suitable personnel occurred when individuals were sent overseas to universities and did not return because they were offered employment elsewhere in the developed world or in a higher paid situation. (89) Ibrahim considered that more effort should be made by international firms to recruit from the ranks of those who were already working in neighbouring territories; they were often of high calibre but had left for more challenging work or better pay. This was true of some engineers in the Gulf region. A pointed example of this brain drain was some past training that had been initiated by the Arab Fund in Gambia. One of the first engineers to benefit from this scheme had been assigned to a Swedish firm and to a consulting engineer in Britain, after which he returned to direct the Gambian Public Works Department. Ironically that same post was now occupied by an expatriate from the UK because the original occupant had moved on to work for the Islamic Development Bank. (90) This can only serve to show that there may be a necessity to monitor the effects of technology transfer more judiciously in future in some countries.

Based on the previous sections, consultant's attitudes to technology transfer are now discussed. It is evident that different firms have been adopting varied positions, ranging from resigned pessimism to optimistic and calculated opportunism.

4.6 CONSTRUCTION CONSULTANTS' STRATEGIES IN TECHNOLOGY TRANSFER

The Unfavourable View of Technology Transfer

Although many foreign consultants agreed that the best way for technology to be transferred was by close cooperation between the local and the international firm, they still regarded permanent associations with suspicion because they saw them as ways of working themselves out of a job. To work properly "the consultant had to feel reasonably safe that there was a fair chance of continuation work, even though continuation might mean a changed role". (91) Both Al Shehabi (92) and Starr (93) concurred that many consultants saw technology transfer as undermining their own future prospects.

From an aid agency viewpoint, other firms were described as providing insufficient effort and were often "unwilling or unqualified to give proper training"; yet others were reluctant to "transfer confidential know-how or promote possible future competition". (94) Some consultants had seemingly become involved in areas which were "not really their traditional domain of experience and expertise". Often this obliged these consultants to recruit staff from outside their own firms, which usually led to higher costs. (95)

A technical assistance element seemed to be included in most aided projects and this often called for "institution building including organisation and management studies, staffing and training studies" as well as project implementation. Some firms "vigorously sought this kind of work" but, from the aid agency's perspective, it was specifically from this sort of firm that the "results were the most disappointing". (96) These firms were similar in business attitude to the "cash-cow" management consultants of Sharma (97) but without the same performance to assure their own future reputation.

Technology Transfer - A Long Term Way of Life

There were some consultants who seemed to cope better in the long term than others, sometimes almost unwittingly. One of these consulting engineering firms had an attitude of the "practice-centred" business, as illustrated by the statement below. (The firm from which the comment came was positioned in the "problem-solver strong-idea" firm category of Coxe. (98))

According to Ahm, the leader of one of the UK's larger consultants, "consulting engineers had to make a profit" but few would become consulting engineers "if their main motivation was to make a profit ... there had to be job satisfaction for any professional man. Job satisfaction was to train and educate young people because that was the only way in which the firm would continue in business and make a profit". In this same firm, one of the largest in the UK, "at the last count there were 44 nationalities represented" and each of the new graduates joined the firm on the same basis of salary as UK engineers. When they returned to their own country, there was continued benefit for the firm in a flow of some further work. (99)

While this practice-centred business seemed to declare little interest in short term gain, they had an intuitive far sighted policy, stretching back over many years, and this gave them an edge over other firms and helped their business to continue. They had "cast their bread upon the waters" many years before and were "finding it in the present day". The puzzle of a client's apparently illogical dependence on a consultant, even after the completion of the prescribed service is pithily described by Turner in Appendix A-1. (100)

Technology Transfer - An Opportunity to be Grasped

Continuing on this brighter note, Starr considered that "good training proposals could help secure new work". (101) He also noted overall that "the rewards for technology transfer were great, not just in generating new business for Western consultants, but also because of the good returns made possible due to the investment in human resources". (102) Similarly, Eldridge cited the instances of training in his UK firm of consulting engineers, involved in large water projects, where a capability had been built up in recent years to cater for training needs of clients. In-house staff were used "particularly on such matters as management where the firm could expect there to be a possible continuity of work". (103) As discussed earlier, Sharma also saw management contracts as situations offering an opportunity which should be "nursed" by the consultant so involved. (104) Joong-Woo believed that "important competitive advantages were created through training. The firm could maintain its position by means of the continuous contacts with the client, which erected a barrier to entry for newcomers". (105)

Abbott emphasised the positive side even more by concluding in his review that "some companies had seized upon technology transfer as a means to break into new markets, but their numbers were small". On the face of it, it appeared that the majority of transfer programmes were provided because they were requested by another organisation, rather than being provided because the donor organisation saw a "financial and business advantage and initiated a programme because of this". On the other hand, some companies had entered "technology transfer agreements as part of a planned and commercial strategy". This strategy was "geared towards gaining a firm foothold in markets, not for short term advantage, but rather for medium and long term growth". (106) Such an attitude would follow an active approach as noted by Sharma & Johanson. (107) From a strategy perspective it

would also be expressive of a focus through differentiation as advocated by Porter. (108)

Abbott went on to point out that technology transfer was very probably a growing side of a falling or stable market: "There was no reason to suspect that, even if the value and volume of foreign contracts awarded to the international contracting or consulting organisations progressively declined, so too would demand for technology transfer. If anything, demand for technology transfer (in the construction industry) was unrelated to total business volume. The need to acquire technology for a generally weak local industry in developing countries was continuous". (109)

A Cautious Note on Long Term Relationships

Clients' antipathy for technological dependence might reduce these prospects to some extent however. As Frick-Meyer put it: "Long lasting relationships were sometimes suspect and it was difficult for any bureaucratic organisation to persist in such a relationship" for long periods. (110) However networks of relationships might also come into play which could extend contact for indefinite periods. Johanson and Sharma's example of one client's cooperation with its consultant over a period of fifty years illustrated this. (111)

REFERENCE FOOTNOTES: CHAPTER 4

- 1 OXFORD (59): p 1038: OXFORD (84): p 1098
- 2 ADEJUMO (80): p 168
- 3 CONTRACTOR (81): p 115
- 4 CONTRACTOR (80): p 47
- 5 CONTRACTOR (81): p 115
- 6 RODRIGUES (85): p 21
- 7 SCHUMACHER (73): p192-206
- 8 CONTRACTOR (81): p 122
- 9 RODRIGUES (85): p 21
- 10 KIRPICH (86): p 153
- 11 DANIELS (82): p 167
- 12 SCHUMACHER (73): p 136-149
- 13 MORDELL (82): p 23
- 14 HILL (80): p 40-51
- 15 SHIVASTRA (84): p 25
- 16 KNIGHT (87): p 13
- 17 RODRIGUES (85): p 22,25
- 18 BENIVIGNATI (83): p 63
- 19 SHARMA (87a): p 247-249
- 20 SHARMA (87a): p 248
- 21 JOONG-WOO (87): p 38
- 22 SHARMA (87a): p 249
- 23 ABBOTT (85): p 33
- 24 BINGER (80): p 199
- 25 GRAY (80): p 151
- 26 ELDRIDGE (84): p 83
- 27 LOTTI (80): p 185
- 28 ADEJUMO (85): p 13
- 29 WANGSADINATA (84): p 57
- 30 ABBOTT (85): P 5
- 31 ABBOTT (85): p 47-49
- 32 COUKIS (80): p 156, 157
- 33 COUKIS (80): p 157, 158
- 34 ABBOTT (85): p 36
- 35 ELDRIDGE (84): p 84
- 36 STARR (85): p 105
- 37 FRICK-MEYER (83): p 10
- 38 SHARMA (87a): p 253-260
- 39 STARR (85): p 110
- 40 STARR (85): p 108
- 41 DICKERSON (79): p 65,66
- 42 DICKERSON (84): p 36
- 43 IBRAHIM (83): p 33
- 44 CULLIVAN (79): p 73
- 45 HAJJ and SBAITI (83): p 55
- 46 IBRAHIM (83): p 15
- 47 ADEJUMO (80): p 175, 176
- 48 HAJJ (83): p 32
- 49 BINGER (83): p 27,28
- 50 HOOD (87): p 1217,1218
- 51 BERGER (79): p 75
- 52 ABBOTT (85): p 43,44

- 53 DICKERSON (80): p 137
- 54 BINGER (79): p 188
- 55 UN CAMPO (79): p 179,180
- 56 ENR (83): p 38
- 57 ENR (86): p 28
- 58 ENR (89): p 44
- 59 OLYFODRURIN (80): p 196,197
- 60 ALUKO (80): p 146
- 61 ABBOTT (85): p 30-32
- 62 ADEJUMO (80): p 173,174
- 63 AL-SHEHABI (83): p 16
- 64 BERGER (79): p 75,76
- 65 DICKERSON (79): p 67
- 66 DAJANI (83): p 19
- 67 DICKERSON (79): p 67
- 68 ADEJUMO (85): p 13
- 69 EL-HELW (83): p 26,27
- 70 DICKERSON (79): p 72
- 71 HAJJ (83): p 32
- 72 ALUKO (80): p 196
- 73 HAJJ (83): p 32
- 74 STARR (85): p 107
- 75 ELDRIDGE (83): p 25
- 76 PARGALL (79): p 188
- 77 HAJJ (83): p 32
- 78 MANSFIELD (87c): p 1226
- 79 ELDRIDGE (84): p 94
- 80 ELDRIDGE (84): p 91
- 81 ELDRIDGE (84): p 92,93
- 82 WANGSADINATA (84): p 54
- 83 KULASINGHE (84): p 95
- 84 BUNNI (83): p 20
- 85 WANGSADINAT (84): p 54,55
- 86 ELDRIDGE (84): p 85,86
- 87 ACHIRAL (84): p 93
- 88 BINGER (83): p 28
- 89 FRICK-MEYER (83): p 10
- 90 IBRAHIM (83): p 33, 34
- 91 IBRAHIM (83): p 11
- 92 AL-SHEHABI (83): p 16
- 93 STARR (85): p 103,112,113
- 94 HAJJ and SABAITI (83): p 55
- 95 HAJJ (83): p 33
- 96 HAJJ and SABAITI (83): p 54
- 97 SHARMA (87b): p 5,6
- 98 COXE (87): p 110-112
- 99 AHM (83): p 34, 35
- 100 TURNER (82): p 125-129
- 101 STARR (85): p 103
- 102 STARR (85): p 112,113
- 103 ELDRIDGE (84): p 22-25
- 104 SHARMA (87b): p 17,18
- 105 JOONG-WOO (87): p 37
- 106 ABBOTT (85): p 72

- 107 SHARMA and JOHANSON (84): p 21
- 108 PORTER (85): p 14,15
- 109 ABBOTT (85): p 71
- 110 FRICK-MEYER (83): p 17
- 111 JOHANSON and SHARMA (84): p 21

CHAPTER 5 AN EMPIRICAL REVIEW OF THE BRITISH INTERNATIONAL CONSTRUCTION CONSULTING SERVICES SECTOR

5.0 SUMMARY OF CHAPTER 5

1. Studies in the international construction services sector are introduced.
2. Information on international projects has been obtained through various channels such as direct visits overseas, links through local offices, joint ventures etc.
3. Strengths lay in technical expertise encompassing a breadth of multi-disciplinarity and in offering a set of services to suit client needs; some were related to British standards.
4. Weaknesses were attributed to an inability to fund front-end investment, often linked to size of the organisation.
5. Opportunities were seen to be occurring in different types of packages and training arrangements.
6. Threats were seen in cuts in world international construction demand. Competition was stepping up from NICs. Payment risks still abounded.
7. Competitors were strong on lower prices and creating financial packages but they were weak on quality.
8. Consulting firms went overseas for greater potential and to use home expertise etc.
9. Consulting firms "took off" as international firms when they reached the 350 size mark. A reasonably wide range of disciplines was offered.
10. A home base was useful for training younger staff. A balance between home and overseas was needed; usually a 50:50 mix was favoured.
11. Benefits of overseas work arose from increased competence, job satisfaction, increased turnover etc. Disadvantages came from large overheads, late payment etc.
12. Emerging difficulties arose from greater activity on the part of developing countries.
13. Problems arose from overdependence on traditional markets; future openings lay in the correct provision of a set of specialist services.

14. Sub-letting, as an extension of piggy-backing, was hardly occurring at all from professional firms but it was far more prevalent amongst contractors and suppliers.
15. Consortia afforded a chance for smaller firms to come together for bidding but credibility among clients was not established that easily.
16. A local host country agent could be chosen through a trade mission or from having worked with a company before (elsewhere) or from a choice made following a direct visit.
17. A subsidiary office was usually the offshoot of a project. Autonomous subsidiary offices could produce referral (repeat) work.
18. Local host country consulting firms could be used to share straightforward work and access local knowledge.
19. Joint ventures were evident on international projects but incompatibility could arise.
20. Client requirements favoured the use of a lead firm, possibly using a management contractor.
21. Some large construction service firms found that turnkey and boot arrangements provided profitable openings.
22. British contractors did not win more than a quarter of those contracts let by British consultants.
23. British firms saw strengths and future opportunities in specialist technical fields and types of packages, which could enable firms to compete against firms from the developing and newly industrialised countries.
24. Firms can use networking, and consortia to a limited extent. Joint ventures and local offices continue to be adopted.
25. Technology transfer projects should provide a basis for increased opportunity and success.

5.1 INTRODUCTION

This chapter reviews empirical evidence mainly from the British construction consulting services sector against the backdrop of the theories of construction firms' internationalisation, which were the topic of Chapter 3. This points the way forward to issues relating to technology transfer as a component of business success for British consulting firms in the future.

Most of the material is derived from two construction studies, involving the author. These were significant works of their kind in the British consulting sector, which appeared in published form between 1986 and 1988 (see Appendix).

The first study, described in Sections 5.2 to 5.7, concentrates on the early stages of a project from the time that information is first sought by firms. Interviews across international firms throughout the UK were conducted in 1987 with twenty organisations with projects overseas. Two thirds of the firms were Consultants and other construction professionals. The overall interview sample was: Consulting Engineers (6) Architects (5) Surveyors (2) Contractors and Turnkey Operators (5) and Capital Goods Manufacturers (2).

The second study, described in Sections 5.8 to 5.13, addresses some of the key factors associated with consulting firms' internationalisation. One of the first questions to be addressed here is the actual motivation of firms and its managers as well as the perceived advantages and disadvantages of working on overseas projects. Thirty firms solely in the consulting engineering sector were interviewed in 1983 and this forms the basis of the study. (An additional thirty interviews were conducted with associated contractor and client organisations and these tended to confirm the findings arising from the consulting sector alone).

From section 5.14 to 5.21, material from both the studies is used to expand upon the forms of internationalisation; adopting the order already appearing in Chapters 1 and 3.

5.2 THE RUN UP TO BIDDING ON INTERNATIONAL PROJECTS (1)

The Process of Obtaining Overseas Work

Further to chapter 1, where the subject of bidding on international projects was described, data was gathered from the firms on the process by which three of their recent commissions or contracts had been obtained; these details, representing some 50 projects, are summarised in Table 5-1. The importance of a network of relationships with other companies at home and abroad and the international and UK aid agencies is shown to be of major significance for all types of construction sector firms. These relationships, however, appear to be particularly important for consulting engineers, where it was links with the aid agencies that were of paramount significance; and for architects, where a whole range of "other relationships" were apparently important in obtaining work overseas. The links between consulting engineers and many of these agencies are explored in greater depth in later chapters.

Receiving information from whatever source was only the first stage in a lengthy and competitive process, involving prequalification and competitive tendering, not least for the contractors and capital goods manufacturers. What might be viewed in, say the manufacturing sector, as a more common route of obtaining published market information through the official government trade sources or newspaper calls for tender etc. was rather unimportant however in obtaining project related overseas business in international construction services. Information from direct visits out of the UK to target countries and information from overseas links with local offices, local joint ventures or agents were all of far greater significance.

Success Rates in Bidding for Overseas Projects

As is very clear from the above, quite a sizeable proportion of work obtained by the construction sector firms did not involve formal tendering as such. Where, however this did take place, the average success rate was 1 in 10 overall, which was typical of consulting engineers, contractors and capital goods manufacturers. For architects, the figure quoted was 1 in 7; for surveyors, when they were

ROUTES TO OBTAINING SUCCESSFUL COMMISSIONS/CONTRACTS

SECTOR GROUP	No of Commissions/Contracts
ARCHITECTS [14]	
Relationships with other firms (architect, bank, consulting engineers, management contractor etc.)	7
Direct approach through local office in country	3
Direct approach through the local joint venture	3
Repeat business	1
SURVEYORS [6]	
Relationships with other firms/recommendations	2
Repeat business	2
Direct visit from UK to country	1
Invitation following inward mission to UK	1
CONSULTING ENGINEERS [16]	
Links established with World Bank, UN, ADB, ODA	7
Relationship with/approach from other firms (UK equipment supplier, US contractor)	3
Direct approach (through local office, agent, joint venture partner)	3
Follow-up to EIS, newspaper information	2
Repeat business	1
CONTRACTORS [8]	
Relationships with/approaches from other firms	2
Direct visit from UK to country	2
Follow-up to EIS, other subsidiary in country	1
Direct approach through subsidiary in country	1
Repeat business	1
Invitation from ODA to tender	1
CAPITAL GOODS MANUFACTURERS [6]	
Relationships with/approaches from other firms	2
Direct approach through sales engineers, local agent in country	2
Invitation from Crown Agents to tender	1
Repeat business	1

Source : Mansfield (88f) (N=50 Projects)

TABLE 5-1

bidding out of their own overseas offices or bidding with turnkey contractors, success sometimes rose as high as 1 in 3.

Reasons for Failure In Bidding for Overseas Projects

As to the reasons for lack of success, in the majority of cases firms gave price as a cause for failure in bidding. Many other reasons (see Table 5-2) were also highlighted.

Given the coverage of the earlier theoretical section it is not surprising that overall experience was mentioned by a majority of firms. This took the form of not being broad enough, lack of expertise or of experience overseas or of experience in the particular country concerned. The other common reasons cited lack of good connections with the client, political pressure on a government-to-government level, poor financial packages and lack of suitable technical proposals or product style for the client.

To some extent the firm-client contact has to be taken as essential for the clinching of any bid and was probably not mentioned more often by the firms because it was taken as given. Some countries were more in evidence than others when it came to high level government contact. In some instances government influence was described as being interrelated with the financial package. This was also expressed in terms of difficulties of obtaining guaranteed finance and in not being able to obtain sufficient aid from British sources, a recurring theme from Chapter 2.

Technical aspects were more in evidence than firms actually mentioned. Sometimes clients renegotiated a commission or bid on the basis of the best technical proposal or they had a particular product they liked and were prepared to pay for. Some firms found the opposite applied, in that clients did not value the service offered them sufficiently, or the firms themselves estimated on the basis of meeting too high a standard. (The opening chapter has already highlighted this as a common trait in the client-firm relationship for service firms.) Further reasons given for unsuccessful bidding included lack of an ability to demonstrate actual project work in the home market, preference for local companies and indigenous firms, and the

REASONS FOR FAILURE IN BIDDING ON OVERSEAS PROJECTS

Price not low enough

Track Record:

- Lack of breadth or experience of particular work
- Lack of experience overseas
- Lack of experience in actual country
- Lack of project work in home market

Lack of Good Connections with the Client

Competitor Political Pressure at a Government Level

Insufficient British Aid available

Poor Financial Packages

Not enough Guaranteed Finance

Lack of Suitable Technical Proposals

Lack of Product Style for Client

Client not Appreciating Service Offered

Estimate made on basis of Too high a Standard

Being part of Consortium which failed to win bid

Client Renegotiated with Competitor

Preference of Client for Indigenous/Local Firms

Source : Mansfield (88f) (N=20)

TABLE 5-2

simple fact that the company was part of a consortium which itself failed to win the job.

It was noted that aspects relating to bid documents were hardly mentioned by the firms themselves. Late receipt of market information or of bid documents was usually sufficiently critical to stop a bid being mounted; sometimes this was because quotations from other firms could not be obtained in time. Difficulties in preparing and submitting tender documents were not seen as a major problem. If there were difficulties here, the firm simply would not bid. On a few occasions companies found acceptable qualifications a stumbling block. For instance, bidding arrangements were sometimes far too stiff to countenance. Age limits were set for staff working overseas to over 35s in some cases, as in projects for the UN. This issue of the age spectrum has already emerged in Chapter 4 and is further discussed in the case studies of Chapter 7.

Incorrect completion of tender documents was not given by any company as a reason for failure. This last aspect has to be taken together with other studies conducted with clients or aid agencies, however, which do see this as a problem, especially where a foreign language is involved. One consultant pointed out that many British capital goods' suppliers were particularly poor at complying with specification and filling out documentation; foreign competitors were considered to be far more flexible and careful in this regard.

After dwelling on some of the reasons for failure in bidding if only because so many international bids do fail, it is also worth looking at the strengths and weaknesses, and opportunities and threats of the international construction sector. In doing so, construction consultants are discussed along with other construction groups as well as competitors from other countries.

5.3 FIRMS' STRENGTHS (2)

Technical Expertise, Management & International Experience

Firms were requested to assess their strengths and weaknesses (see Table 5-3). Strengths were seen to be related to their "track record" or technical expertise in certain project sectors or parts of sectors. Some saw this as being significant in

terms of the size of projects they could tackle, the UK clients with whom they had connections or the technical superiority and innovation they had achieved. For instance, one of the consulting engineers had a recently developed patented crown copyright system which was unique to the UK.

Track record was also valued in terms of international experience gained either in a single geographic region or worldwide. One firm stressed it had many years of company experience overseas and two others referred to the lengthy experience of their management staff abroad. Teams of managers able to display good interdisciplinary working relationships were also seen as important. Some of the enterprises were happy to record that they could compete on price against other developed countries, such as the Americans and the French, provided both of these were not too heavily subsidised by their governments. Lower wage costs and higher productivity, in the late eighties, were helping the competitiveness of capital goods manufacturers.

Other facets of the firms' strengths lay in the way that services were offered to the client. A few consulting engineering and architect firms emphasised that they provided staff of the right calibre for training in technology transfer. It was seen as an important role that all groups had to play here in assisting developing countries to progress. Those that were involved saw an increasing need for their services with specific backing coming from the international aid agencies; this theme is thoroughly addressed in the later case studies of Chapter 7.

Country Factors

A commonly expressed view was that there was a certain amount to be gained from being British: English was an international language and British standards had been adopted by many countries in which they worked. British consultants had a longstanding reputation for reliability, which had a carry-over effect to other non-consulting groups operating in the construction sector. This apart, some firms had sought to develop particular skills in dealing with clients in French-speaking regions.

The Scottish factor was mentioned by three firms who were based in Scotland. One firm indicated that some overseas clients liked a "low-key nonbrazen approach"; a

second referred to the "totally illogical welcome" that some clients afforded them on first introductions and a third considered that "traditional engineering skills were still valued" in certain quarters.

5.4 FIRMS' WEAKNESSES

Financial Resources, Size and Experience

Under the heading of weaknesses, (see Table 5-3) by far the most commonly mentioned factor by all groups was their lack of financial resources. This expressed itself for consultants in an inability to fund very much marketing and front end speculative work or to participate widely in the bidding process. Many of these ills were to do with the size of the firms. Two smaller consultants were looking to "hitch a ride" with larger contracting groups. Such package cooperation is expanded upon later on in the chapter. Even those firms which were in a medium to large size category believed that their size went against them. Lack of actual international experience was a pressing issue for those firms who were trying to break into the overseas market or who were trying to increase their overseas turnover. Their lack of finance for up-front activity was possible a more crucial factor however. Size may not be such a hindrance to firms' achievement of international success where they become involved in technology transfer projects, however, and this is further examined in Chapters 7 and 8.

5.5 OPPORTUNITIES

Technical Sectors and Funded Projects

Future opportunities (see Table 5-4) were arising on a number of fronts. Overseas sectors of promise were seen in a variety of construction sectors. (See Table 5-5). These included new projects as well as rehabilitation, maintenance and operations of projects completed a decade ago or more. One observation was that there would always be a market overseas for any firm that had "made a name for itself and who could offer a special expertise".

Several new opportunities were seen to be arising in training arrangements with host country firms or government departments. Some of the major agencies were

FIRMS' PERCEIVED STRENGTHS AND WEAKNESSES ON OVERSEAS WORK

STRENGTHS	%	WEAKNESSES	%
Technical Expertise	80	Financial resources	70
Client fulfilling requirements (e.g. technology transfer requirements)	30	Track record & overseas experience	35
Country Factors (e.g. English as International language, British Standards)	30	Size	30
International Experience	25		
Price competitiveness	20		
Personnel & Management Resources	20		
Other (e.g. Local Offices, Multidisciplinary Approaches, Expertise in Turnkey Projects)	20		

Source : Mansfield (88e) (N = 20)

TABLE 5-3

FIRM'S PERCEPTIONS OF OPPORTUNITIES AND THREATS REGARDING OVERSEAS WORK

OPPORTUNITIES	%	THREATS	%
Specific Sectors of technical work	30	Reduced construction demand	35
Aid Funded Projects	20	Increased competition	30
Industry reorganisation, requiring flexibility, multidisciplinary teams, etc.	20	Competitors financial backing	30
Middle East situation, e.g. war, oil price, etc.	10	Emergence of developing country firms	25
Other	25	International risk	20
		Other	25

Source : Mansfield (88e) (N=20)

TABLE 5-4

described as having considerably expanded their budgets in the technology transfer area in recent years, particularly in project related know-how exchange, a point which is investigated in the later case studies. Further future funding was reckoned to be forthcoming from the World Bank and African Development Bank agencies and, also in Africa, through British banking institutions. There were hopes too for increased bilateral funding from Britain.

There were also a number of other possibilities; some firms said they saw gaps in traditional British markets when current UK firms became overstretched or temporarily disgraced. Another firm felt that parts of Africa would still keep coming back to British firms, on account of long standing relationships. As regards future opportunities within a construction industry context, most firms saw this as being expressed in the reorganisation of their offering to suit client preferences; these are discussed later on in this chapter.

5.6 THREATS

Demand Changes

In commenting on threats (see Table 5-4) to their overseas activity, firms pinpointed a number of difficult areas. The foremost of these was that construction demand had reduced worldwide. This was borne out in the overview of international construction given in Chapters 1 and 2, which was further underlined in Chapters 3 where demand was seen as a major factor in firms' locational decisions. A few firms had experienced a virtual drying up of work in those countries linked to an oil economy. Some developing countries were not exporting as much as they had before, due to a fall-off in trade generally and this was reflected in their infrastructure requirements. The more developed countries also had less money to spend on construction, which was a trend observed in the opening chapter. Others saw a major overcapacity problem in manufacturing capability worldwide and a levelling off in demand for "jumbo project" infrastructure.

Competition

Increased competition was a further natural consequence of reduced demand. One firm said that their home base was over-resourced with senior staff who had returned from overseas; dealing with them was made more difficult due to their own firm's policy of fostering in-house company people in order to cope with the demands of overseas work in the first place. This balance of senior to junior staff has already been touched upon in Chapter 3 and 4.

Serious competition was seen to be coming from the newly industrialised countries (NICs); some of their massive contracting groups were undercutting on price, which they partly achieved through much lower overheads; staff and workforce alike were prepared to make do with poorer accommodation and simpler transport. Many developing countries were also increasing their own competence. Some governments were insisting on their nationals participating in doing the work while being trained at the same time, particularly in certain Arab territories, and this has already been highlighted to a certain extent in Chapter 4. Competition was coming from other British firms and from European firms for most of the time and from NICs more often than not. Several other countries were mentioned (see Table 5-6), many of whom received coverage in Chapters 1 & 2. There were also various other factors to be contended with; certain countries were undertaking work for the purposes of obtaining foreign exchange and this greatly influenced their bidding price.

Payment Risks and Financial Backing

The more risky aspects of international work were also emphasised; problems had arisen through not being paid or through long delays in payment when compared to equivalent projects in the UK. One consultant was withdrawing from bidding for overseas projects on their own since domestic projects within the UK had proved more profitable recently, a point borne out in Chapter 2. Their adverse experience of overseas work in the past coloured their present attitudes and they chose instead to bid with capital goods manufacturers or contractors on a package basis, choosing a "grouping" approach rather than an "alone" approach.

OVERSEAS TECHNICAL SECTORS OF OPPORTUNITY

Health
 Education
 Hotels
 Leisure
 Highways
 Traffic Management
 Control Systems for Developing New
 Technology
 Agricultural Engineering
 Urban Planning
 Power Agriculture
 Aquaculture
 Water distribution and sewerage
 Automation and Industrial Processes

Source : Mansfield (88e) (N=20)

TABLE 5-5

COUNTRIES AS MAIN COMPETITORS

	%		%
America	15	Korea	40
Australia	5	India	30
		Brazil	10
France	35	Rumania	5
Germany	20	Bulgaria	5
Italy	15	China	5
Scandinavia	5	Saudi Arabia	5
Greece	5	Gulf States	5
Japan	5	Malaysia	5

Source : Mansfield (88e) (N=20)

Table 5-6

The financial backing from competitor firms' governments, in the form of subsidised bids, bilateral aid and extended terms of payment compounded the risk here, particularly when such subsidised assistance could be assumed to be supporting competitors in any future promising projects. The strength of sterling was mentioned here as having reduced competitiveness. An appeal was made from some Scottish firms for more meaningful financial backing from the Scottish banking sector. The London merchant banks had to be relied upon here but firms doubted whether the best banking support was being made available.

5.7 COMPETITORS' STRENGTHS AND WEAKNESSES

The strengths of competitors (see Table 5-7) were mirrored as would be expected in some of the weaknesses of the firms and the threats facing them.

Low price was mentioned frequently. Koreans were particularly competitive in their bids and this was brought about by their more modest overheads as evidence in their cheaper engineering design and site facilities. India and Brazil had lower salaries. India was competing in the Middle East and Brazil in North Africa. Government financial support was again frequently mentioned in particular the French and Japanese with their government backed companies and access to favourable loan conditions. Heavily subsidised feasibility studies were also giving competitors an advantage. German companies seemed to benefit at the later construction stage by having been involved in the feasibility or design through their own consulting groups.

Financial packages and bilateral aid were also seen as important with the Japanese and French deriving the most advantage here. Americans were attributed with providing good sources of finance. Korea had plentiful supplies of labour and some countries' contractors sourced their staff with European supervisors and operatives from the Indian sub-continent and Egypt. Joint ventures with local host country companies were being arranged most notably by the Japanese for large projects.

As already mentioned, developing countries were also insisting that their own firms did the work where they could. Some developing country and NIC firms seemed to be much more flexible in the way they offered proposals to the client. Some of the

NICs demonstrated "sheer enthusiasm and persistence" here. Americans were described as far better organised in marketing. High product quality was ascribed to the Germans and political associations to the Italians (e.g. Italy/Libya). The French were also more prepared to bring in senior ministers to support a bid than their British counterparts, who "might muster a junior minister".

Competitors' weaknesses (see Table 5-7) were predominantly put down to quality, India being particularly mentioned here. Some European firms could not compete on costs. The strength of the yen had reduced Japan's competitiveness recently. The Koreans were also thought to be overexposing themselves as regards future debt.

As already indicated in the introduction at the start of this chapter, the next sections (5.8 to 5.13) describe a study which concentrates on consulting firms' view of the internationalisation process.

5.8 REASONS FOR CONSULTING ENGINEERS GOING OVERSEAS (3)

Given some of the pressures on consulting engineers to pursue work abroad, it is not surprising to find that many consulting firms went overseas because they saw greater potential. Overseas work was useful as a means of providing work for staff, thereby making the firm less dependent on a reducing UK market. Foreign projects enhanced the image of the firm in the eyes of clients worldwide. For some it was a logical progression to take up the invitation overseas of UK architects with whom they had already worked in the UK.

With certain funding being available only overseas and with so many other nations benefitting from foreign commissions, it would be surprising if British firms were not also participating. In fact, Britain was well represented as has been demonstrated earlier. A number of firms saw overseas work as both a good

PERCEIVED STRENGTHS AND WEAKNESSES OF COMPETITORS REGARDING OVERSEAS WORK

STRENGTHS	%	WEAKNESSES	%
Competitive Prices	55	Quality	20
Government Financial Support	40	Costs	5
Labour Supply	15	Debt	5
		Currency Strength	5
Indigenization Requirements (For Developing Country Firms)	10		
Government Political Representation	10		
Other e.g. Marketing, Quality	20		

Source : Mansfield (88e) (N=20)

TABLE 5-7

opportunity and a means of increasing the size of their organisation; others had gone abroad because they were keen to make maximum use of the sound experience they had already built up at home. This would reflect a desire to trade on their existing strengths or ownership advantages already discussed.

The issue of firm size and spread of expertise has emerged at various points in earlier chapters. In the next two paragraphs this is defined more specifically for the UK construction consulting sector.

5.9 SIZE OF CONSULTING FIRM AND RANGE OF DISCIPLINES

There was reasonable agreement with the information derived from earlier Consultants File surveys described in Chapter 2 that firms began to "take off" as international firms once they reached the 250 employed mark, the point at which Reddaway classified a consulting firm as "large". There are large firms with low proportions of overseas work and medium-sized firms with high proportions of work overseas but these are the exception rather than the rule. Later work indicated that the level of 350 employed was nearer the size required to be international. (i.e. approaching a third to a half their work overseas).

The range of disciplines (see Table 5-8) offered by those firms with large proportions of overseas work was marginally wider than those with low percentages overseas. There was a clearer relationship between the size of firm and the range of disciplines offered. This did not mean, however, that medium-sized firms restricted the disciplines offered; some of them appeared to be almost as wide as the larger firms.

Attention is now given to describing other aspects of working overseas beginning with the balancing effect of home work, which was also discussed in Chapter 2.

5.10 HOME VERSUS OVERSEAS WORKLOADS

Firms were asked their desired preference for the ratio of home to overseas work. Some of the medium-sized companies searched for overseas work but appeared to be content if the home overseas ratio settled at 80:20. Others who were facing

DISCIPLINES (as indicated by types of work undertaken)

- Airports**
- Building Services**
- Chemical Engineering**
- Drainage and Sewerage**
- Electrical Engineering**
- Energy Planning and Conservation**
- Geotechnical and Ground Engineering**
- Harbours and Docks**
- Hydro Electric Work**
- Irrigation**
- Mechanical Engineering**
- Mining Metallurgy**
- Pipelines**
- Railways**
- Road and Bridges**
- Solid Waste Treatment**
- Structures**
- Thermal and Nuclear Power Stations**
- Transport Planning**
- Tunnelling**
- Underwater and Offshore Engineering**
- Water Supply**

Source : Mansfield (86a)

TABLE 5-8

substantial cuts in home workloads (in the first part of the eighties) wanted more overseas work and were happy if it rose to as much as half, and this desired equality between home and overseas business was also evident among the large enterprises.

A variety of reasons were given for the wisdom of maintaining a substantial home workload. A home base was needed to train staff, particularly younger engineers and project managers. According to one firm, "home projects had the advantage of providing contractually and organisationally stable situations". Some overseas clients were insisting on professionally qualified staff which implied that graduate engineering staff for the first five years of their working lives would have to be employed on home projects. There was no doubt that overseas projects made heavy demands on the firm in terms of the large number of highly paid senior staff that were required. A complicating factor was that these staff were not always fully occupied - for example, in the period prior to the clinching of a contract. However, if sufficient home work was available of the right kind, staff on overseas projects in the home office could be absorbed satisfactorily. Even when senior staff were fully involved overseas, it was necessary to allow them to recuperate through a period of work in their own home environment at regular intervals: one large firm was setting out to implement this by assigning such staff, for a period, to a secondary UK office away from the metropolitan setting.

A number of authors have stressed the importance of interpersonal qualities in international construction. It is not surprising, therefore, that staffing emerged as an important factor contributing strongly to success overseas. (See Table 5-9). Staff had to be well suited and thoroughly committed to the task, usually displayed by a willingness to become closely involved with the client over a long period. One firm particularly emphasised that this had to occur at partner level.

Good connections made in the past were seen as most important in clinching overseas work and this underlined the need for a network of contacts as described in Chapters 1 and 3. A good local agent in the country of operation, who had proved himself in the past, was a great asset. Most firms emphasised again that a satisfactory track record was another crucial factor in marketing their services to prospective clients. On reflection, however, some felt that the work they had

KEYS TO SUCCESS AND FAILURE OVERSEAS

Success due to:

1. Well suited and thoroughly committed staff.
2. Close involvement with client at the highest level.
3. Good connections from past.
4. Good local agent.
5. Satisfactory track record
6. Substantial volume of work available worldwide.

Failure due to:

1. Poor local agent (a)
2. Delay in satisfying local registration (a)
3. Competitors better sellers (b)
4. Lack of formal plan
5. Underestimated scope of task

Note: (a) Medium sized firms

(b) Larger firms

Source : Mansfield (86a) (N=30)

TABLE 5-9

landed was closely linked to the substantial investment that had already been made by the firm overseas, or the large amount of work around at the time in the countries where they were looking.

Some firms clearly had been disappointed in their overseas aspirations, particularly the medium-sized enterprises. (See Table 5-10) This was put down to either a poor local agent or to delay in being able to satisfy the local registration requirements. Some large firms were losing out to allegedly technically inferior firms who, irritatingly enough, were "better sellers". Others honestly admitted they had gone overseas in the early days without any formal plan or that they had very much underestimated the scope of the task.

5.11 BENEFITS AND DISADVANTAGES OF OVERSEAS WORK

As might be expected the actual benefits ascribed to overseas work (see Table 5-10) were closely linked to the reasons given by the firms for going overseas in the first place. Some indicated that standards could be developed through the greater variety of work available overseas. Firms became more technically competent since some work rarely occurred now in the UK; for instance new ports. Job satisfaction was usually increased for all staff and prestige for the firm resulted from the more interesting work on hand. Staff liked going abroad because they were better rewarded and had the opportunity of travel. From the company's viewpoint valuable staff were kept employed and kept together within the organisation. Financial turnover could be maintained at a higher level, since overseas projects were larger in value and longer in duration. This had the beneficial effect of balancing out the frequent peaks and troughs arising from a solely UK dependent workload. Certainly more opportunities presented themselves overseas and profitability, admittedly a function of risk, was usually greater than in the UK.

The disadvantages cited in conducting overseas work were found to be an extension of some of the negative factors already described. (Many of these were matters of equivalent concern for the wider construction services group, as was pointed out earlier in this chapter). A heavy front end investment was required because of large overheads, due to the nature of the work and the geographical separation from the UK. Recuperation of this outlay was invariably delayed by late payments, difficulties over currency exchange rates, or an inability to transfer funds back to

SUMMARY OF BENEFITS AND DISADVANTAGES

Benefits:

1. Firm standards improved
2. Greater technical competence achieved
3. Job satisfaction for staff
4. Prestige for firm
5. Useful staff kept employed
6. Financial turnover increased
7. Projects obtained with larger size and longer duration
8. Balancing effect on overall workload
9. Greater opportunity and profitability

Disadvantages:

1. Heavy front end investments
2. Large Overheads
3. Late payment
4. Currency exchange complications
5. Higher margins necessary
6. High risk business
7. Political upheaval
8. Greater chance of failure
9. Client misunderstands nature of service offered
10. Much time spent travelling
11. Wear and tear on individual senior staff
12. Hard to find right calibre of staff
13. No fixed fee scale and "free for all"
14. Undercutting by competitors
15. Some unscrupulous clients

Source : Mansfield (86a) (N=30)

TABLE 5-10

the UK. Margins had to remain high for profitability to be assured. It was very evident that a wide range of experience was needed to operate effectively overseas and this was not acquired overnight.

Overseas work was considered to be a high risk business, with added political complications in some countries. Many of the smaller medium-sized firms were reluctant to launch into overseas work in too committed a fashion because a greater proportion of the firm's resources would be put in jeopardy. It was also believed that there was far greater risk of a large contract going "badly wrong" overseas as compared to a similar project in the UK.

In a few cases clients were finding it difficult to understand the nature of the services being offered to them by consulting engineers, an aspect common to many service sector firms as already noted. In many countries the idea of a fixed fee scale could not be entertained. One firm considered that some overseas clients were becoming more unscrupulous. At the same time, undercutting by competitors was much in evidence. Other disadvantages arose as a result of a project's location. Much time had to be spent travelling, which took its toll on the individuals concerned. Some firms declared it was far from easy to find the right calibre of personal to place overseas particularly for medium or long term assignments, although one company thought that recession (in the first half of the eighties) in the UK was easing the situation.

5.12 EMERGING DIFFICULTIES

Firms were then asked to comment on the difficulties they experienced in remaining in the overseas market. (See Table 5-11) Competition was considered to be stepping up, particularly from developing countries who were able to provide their own engineers more cheaply in some technical areas. Some firms found that clients were increasingly stipulating that their own national engineers be employed to work alongside the consulting engineer, and this provided not a little concern. This aspect was mentioned as a significant issue in the wider construction services sector and has already been touched upon in Chapter 4.

Many competitors undertook the work, primarily it appeared, as a means of gaining foreign exchange, and allegedly enjoyed more support from their own home

EMERGING DIFFICULTIES OVERSEAS

1. Competition increasing particularly from developing countries
2. Host government national engineers cheaper
3. Client stipulation that national engineers work alongside
4. Competitor countries undertaking work for foreign exchange
5. Unfavourable terms of cover for British firms by ECGD
6. Aggressive marketing overseas expensive
7. Necessary to consolidate at home to survive
8. Lack of availability of suitable contractors for complex work
9. Corruption ramifications

Source : Mansfield (86a) (N=30)

TABLE 5-11

governments. There was considerable support for the view that the Export Credit Guarantees Dept. (ECGD) should provide more favourable terms of cover for British enterprises. Smaller medium-sized firms said they could not afford to have senior personnel touring the world looking for work and that aggressive marketing overseas was expensive. The desire to thrust out overseas was not helped by the need felt by some companies to consolidate at home. Finding a suitable contractor presented difficulties in certain quarters, especially where projects were technically complex. Corruption caused complications in a few cases, and was clearly a more pressing issue in some countries rather than others.

5.13 PROBLEMS AND FUTURE OPENINGS

New problems considered likely to emerge in the future were that too many enterprises (in the early eighties) were dependent on traditional markets, notably the Middle East, and growth was required in fresh areas. There was evidence of work drying up in a number of countries. Since the mid-eighties Asia has come into prominence as a more popular developing country market for UK consulting firms as was shown in Chapter 2.

Opportunities in the future were believed to lie in French-speaking areas in a few cases. Others saw the correct packaging of their service as an important factor, and this is expanded upon later on in this chapter. One medium-sized firm in the sample thought the future must lie with large firms "who would continue to do well overseas because they had the advantage of size and proven experience". (The matter of firm size and of joint ventures surfaces again in Chapter 7). Another company considered that future projects overseas could become "gap plugging" or that future success would lie in the provision of a set of specialist services; but in regard to the latter, few firms volunteered to identify any service on offer that was markedly different from that of their competitors.

It was considered that British diplomatic services could provide better assistance than they were doing at present. One firm noted that when help had been requested from a British Embassy in a French-speaking area, the reply lacked any kind of commercial urgency and this rendered the assistance of little use. A number of firms pointed out that the European Development Fund quota for British contractors

had been well below target. Under-usage of their quota by contractors suggested a future opportunity for consulting engineers if the rules could be adjusted in their favour.

Other companies considered that British aid should be allocated in a more advantageous manner to the greater benefit of UK firms. There was further mention of such increasingly successful competitors as Japan, Korea and Russia where backing was far better orchestrated by their own governments.

In the next few sections, 5.14 to 5.21, empirical evidence in the wider construction services sector (from the same sources as employed so far in this chapter) are used to illustrate and expand upon the different routes to internationalisation, which have already been introduced in Chapter 1 and 3 from a descriptive and theoretical viewpoint.

5.14 SUB-LETTING, AN EXTENSION OF PIGGY-BACKING (4)

The inter-relationship between firms and companies in the construction services industry has to be very close in certain circumstances. As was shown in Chapter 1, one way that firms attempt to reduce risks of overseas exposure is to have work passed on to them through subletting, which has some similarities with piggy-backing.

In the vast majority of instances, where sub-letting as an extension of piggy-backing was taking place, any work being passed on to other firms was of a specialist nature, and examples of this are illustrated in Table 5-12. On very few occasions was overcapacity mentioned as a reason for passing work to other firms, although one case arose as a result of an architectural competition: time was pressing and so another company was brought in to help.

There was positive evidence of work being passed on from major contractors and major consultants to other smaller firms. Several of the larger consulting engineers and architects were, however, sceptical of this occurring at all in their own professions. Their feeling was that larger professional firms kept their own work and would not be likely to sub-consult. The small firm, by this view, had to find their own niche or ignore overseas work altogether. In effect, for consulting

EXAMPLES OF SOME TYPES OF WORK PASSED ON

Groundwater Engineering
 Acoustic Work
 Natural Spa Water
 Mechanical & Electrical Services
 Routine Tasks (e.g. some draughting)
 Architectural Transport Specialisms
 Economist Work
 One-man Consultancy Work
 Environment Work
 Project Management

Piling
 Blacktop
 Earthworks
 Ventilation Electrical Work
 Fabrication, Manufacturing
 Electrical Motors Valves
 Control Systems

Architect Design Work }
 Consulting Engineering Design Work }
 Quantity Surveying }

Types of work passed on
 to construction groups
 other than their own

Source : Mansfield (88f) (N=20)

TABLE 5-12

engineers, architects and surveyors, this amounted to as little as a tenth or a twentieth of their total work, although for contractors and capital goods manufacturers it was as much as a half to two thirds.

The route most likely to win small firms overseas work was thought by a majority of firms to lie in combination with larger international companies. However, there was also a fair body of opposition to this view, one firm pointing out that some smaller consulting specialist companies had been taken over by larger accounting and management consulting groups. Here, the larger firm recouped a proportion of the profit and the smaller firm gained access to the wider contacts of the larger group and, in addition, was able to count on the superior financial backing from the group. Another firm pointed out that the major equipment suppliers and capital goods manufacturers were being forced to compete in providing a total package in world markets. This led them to draw upon the services of consulting engineers and other groups. This was an arrangement which one medium-sized consulting firm found it convenient to fall back on, as was shown earlier.

5.15 CONSORTIA (5)

Cooperative arrangements have already been discussed under the heading of the "consortium" in Chapter 3, as one means of entry into new markets. The possibilities of these consortia arrangements were explored. Most of the companies believed that there were opportunities for bringing together smaller firms to form consortia for obtaining overseas work. However, the number of those who were "enthusiastically" positive was not so high and there tended to be an emphasis on the pitfalls associated with this type of arrangement. A major objection was that consortia of firms might be unable to quote competitive prices and that there were few small firms of sufficient status to make a consortia work. In regard to the former point, one company might put in a higher bid price than it would if it was quoting on its own. In consortia, the assessment of risk could be a problem, so that such arrangements might work satisfactorily for distributing the profits but it was not so easy when it came to splitting the losses. Again, UK law on consortia arrangements was thought to be less helpful than in some Continental European countries. Problems also emerged with liability for professional indemnity insurance.

Consortia were often favoured by clients on very large projects but it was uncertain how they would react to consortia which consisted of groups of smaller firms. It was felt by many that the best arrangement would be one where a single firm took the lead, with other firms acting as sub-consultants or subcontractors, as necessary. One view was that a large pool of companies could be registered in readiness for such a consortium, although only a number of them would actually participate for any one project. Each consortium would then be judged on a job-by-job basis according to the type of work and the extent of complementarity required. The question of inputs into consortia was raised by a number of the sample firms. One company pointed out that a major reason for any firm failing to succeed in the export business was "lack of contacts". By participating in a consortium arrangement, the successful companies were effectively sharing their contacts, which could have damaging effects on their competitive position in the future.

Some of the main criticisms were directed at consortia which involved groups of like professional firms. There could be too much inter-rivalry and mutual distrust between members of such groups. On the other hand, there were positive advantages where group members were complementary. In this case, each company would attend to their own specialist discipline, and all firms could expect to get a share of the work. It was pointed out that teams of multi-disciplinary firms were already working together in the industry, but this was usually for one client who repeated the formula on successive jobs. Inevitably, some of the larger firms felt that they would put more into a consortium arrangement than they would glean from it, and they preferred to organise their own liaisons or take the lead in such cases. Having said that, many of these companies also felt they wanted to keep their options open. A consortium might have its attractions if the situation warranted it, as for example, when it offered the possibility of accessing specialisms which were not available in-house. In general, therefore, the view towards consortia arrangements was generally favourable, but with substantial reservations at the practical and implementation level.

5.16 THE HOST COUNTRY LOCAL AGENT (6)

In order to enhance the possibility of consultants themselves securing overseas work, business links involving a commercial sharing were often formed in the country of operation as was shown in Chapter 1 but usually these would be of a

temporary nature. Several companies confirmed that in many countries a local agent was a built-in requirement for obtaining any work at all in the first instance. The precise role of the agent did vary greatly from country to country.

It was observed that UK consulting firms had evolved three different methods of selection for an overseas agent in the host country. One method was to select an agent through a government sponsored trade mission or via the contacts of the embassy attache. A second was to work via a local company with whom the firm had previously worked in a different part of the world. A third method was simply to establish contact through the specific visits of the partner or representative concerned. As far as was possible the agent's commercial and political connections would be assessed along with such important qualities as drive, personality and integrity. It was usually up to the UK representative of the firm, in the area at the time, to make the appropriate selection and this was not an easy matter. It was noted that two medium-sized companies had closed down their operations overseas mainly due to a lack of proper understanding with the local agent. One agent "failed to produce any work at all", and another "conducted work in such an unbusinesslike manner" that connections had to be severed.

5.17 PROJECT OFFICES AND EARLY SUBSIDIARY OFFICES

A small number of consulting firms said either they would definitely not open an office ahead of a project or, conversely, that opening an office showed a clear commitment to the area. The majority said that an office was normally a straight offshoot of a project already obtained in a country. The main disincentive with establishing offices was the long time-lag sometimes required between first opening and the subsequent landing of a commission. High initial outlays and accumulating overheads could not permit speculative offices to continue much beyond 2 or 3 years. (7)

However where success was registered, it was partly because some professional firms had expended much effort in establishing themselves in the host country. Good contact was being made with the client through well established local offices, equipped with autonomous directors or partners, and fully qualified senior staff on the spot could provide an instant local service. This was effective in achieving a high proportion of repeat orders and referral work. (8)

5.18 THE HOST COUNTRY CONSULTING ENGINEERING FIRM (9)

Local consulting engineers within the host country were sometimes the instrument with whom work was shared. On occasions this was mandatory. Benefits from a project could be split half and half, although the local input was sometimes nominal.

As regards local consulting engineers, some firms were more enthusiastic about them than others, and saw them as possessors of local know-how with whom it was also useful to share bread-and-butter work. Smaller UK enterprises in the early stages of penetration overseas found that their connection with local firms was a satisfactory way of conducting work. However, the decision on the actual inclusion of a local consulting engineer was noted to vary from project to project even within any one country.

5.19 JOINT VENTURES (10)

Many of the construction services sector companies had experience of working overseas in a collaborative capacity either in the form of consortia with other companies (as has just been discussed) or in a variety of types of joint venture arrangements. Company responses showed that two thirds had worked in a consortia with other UK firms. Half had joint-ventured with developing country firms and a third had joint-ventured with other developed country firms.

While the term consortia was generally understood to refer to a larger group of firms coming together, joint ventures involved a smaller number - maybe only two or three companies. Similar problems were found in each however. Joint ventures were seen to be "messy contractually", and there could be a lack of clarity in defining the responsibility of the parties involved. Questions of compatibility and incompatibility also arose in joint ventures: one sample company specifically avoided joint ventures with local firms in a developing country context for reasons of technical incompatibility. (This issue surfaces again in Chapter 7 and 8). On the other hand, another company chose the joint venture route as a deliberate policy option, where it was found to help the problems of communication in a foreign language as well as facilitating access to client Ministries.

5.20 CLIENT REQUIREMENTS, MANAGEMENT CONTRACTING, PACKAGES etc

Some differences were noted between home projects in the UK and those overseas. For domestic projects, the extent to which consulting firms depended on existing clients was high and this was more marked where larger contracts were concerned. However, overseas, there was a far greater incidence of new clients. In fact it was the majority source of business. Management contractors, contractors and other consulting engineers were also more common providers of work overseas than in the UK; in these cases, the latter organisations were acting for the client in a "lead" capacity. (11)

Some medium sized consulting firms envisaged there would be a greater involvement on the part of contractors who might increasingly take the lead through management contracts and joint ventures with consulting engineers; for instance, one large consulting engineer considered that "joint ventures would occur through consortia with other British firms or through British contractors taking the lead in providing an attractive financial package to the client". (12)

Changes were occurring in the ways that firms were obtaining overseas work. Clients in the past who had usually invited one consulting engineer only to conduct feasibility followed by design, were now more likely to be calling for competitive tenders based on price or a lump sum bid. One large consulting firm suggested that "competitive packages might be offered to other clients through co-financing arrangements with merchant banks, partly provided by the funding agencies", and that "there was a tendency for aid donors from other countries to give through the International Development Agency (IDA) and make more use of tied bilateral aid arrangements, thus reducing the market for British firms". (13)

5.21 TURNKEY AND BOOT ARRANGEMENTS

Amongst some of the wider construction service sector firms, a multidisciplinary approach supported from an organisation of sufficient size was seen as being very useful in maintaining a firm's competitive position. One highlighted their skill in being able to negotiate turnkey contracts with clients and in being able to mobilise

high level contacts in British government departments to guarantee financial assistance at a crucial stage in the bidding process. Turnkey projects produced healthy margins for those contractors who were large enough to handle such projects; one of these contractors had grown substantially in the last decade using this approach. (14)

With an eye to future opportunities, one firm considered that surveyors would benefit in the American market if they could tailor their service to meet the needs of "construction project and cost management". Others saw a more multidisciplinary approach as a future fruitful avenue. Much would be done through total project management and the bringing together of packages. New trends in the privatisation of large projects through build-own-operate-transfer (BOOT) were instanced, e.g. water and electricity supply facilities. Overseas clients were wanting an all-in project involving arrangement of funding, design, construction, maintenance and operation. (15)

5.22 THE CONSULTANT-CONTRACTOR RELATIONSHIP

With regard to the relationship between consultants and contractors, Sapir observed that "there was a tendency for the suppliers of equipment to belong to the same country as the suppliers of consulting/engineering services, even when international competitive bidding applied". (16) For all overseas commissions won by UK consulting engineers, it is possible to determine the proportion of contracts which have gone to UK contractors in the capacity of main contractors. For the period 1981-85, foreign competitor contractors were taking an increased share in Africa of those projects emanating from British consulting engineers; in the Middle East it remained fairly steady, if anything falling. What is clear is that British Contractors have constructed as little as one tenth and rarely more than a quarter of all those projects designed by their British consulting counterparts. (17) In essence this "data from Africa and the Middle East showed that there was a tendency for UK consulting engineers not to recommend placement of business with UK contractors". (18) Later work, for the period throughout the eighties for Asia and Africa, confirms these sort of proportions and also indicates a growing tendency for contracts to be conducted through joint ventures with local firms.

5.23 APPLICATION TO THE ECLECTIC APPROACH

In introducing some of the theoretical literature of Chapter 3, it was noted that both Boddewyn (19) and Nigh (20) called for more studies in the services area; this empirical chapter has made a contribution in that direction by surveying a cross-section of the main groups within the British construction services sector, especially the construction consulting sector. As was shown earlier, the theoretical eclectic approach is able to serve as a framework for understanding the different influences that groups of firms face in extending their business overseas.

Ownership Advantages

Firms demonstrated that they had expertise to offer and were able to differentiate themselves from competitors in some instances. Reputation, size, human capital and breadth of services were shown to be vital firm specific ownership advantages; the quality of management and international experience were also key elements. Some Newly Industrialised Countries could demonstrate greater flexibility and understanding of client needs however.

Home-based country specific ownership advantages of competitors were seen in the financial and political backing, sometimes forthcoming from the intervention of top ministers and from the effective subsidy of feasibility studies. Financial institutions did play a part in determining whether projects could go ahead in certain regions, e.g. via the major aid agencies and the private UK banking sector. There were clear home country advantages and evidence of firms responding to former home clients' requests to take up projects in new regions.

Internalisation Advantages

The extent that firms gained internalisation advantages from internalising their attributes and dealing across national borders was also explored. As was explained in the first two chapters consulting engineers, surveyors and architects, unlike contractors, do not have to carry out their service on the site of the project location. They are more free to carry out some of the work in another country and gain certain advantages from doing so. For all groups it was necessary to maintain

control of their operations. The possession of offices across countries appeared to confer advantages in being able to raise capital in the UK, in being able to transfer the name and reputation of the firm around the world and in being able to gain advance information for marketing purposes. There would appear also to be benefits in transferring various production techniques between offices, which assist the firm to maintain a competitive edge in the foreign location.

Locational Advantages

With regard to locational advantages, firms did indicate that they tended to operate out of countries where they already had projects. From that base they could tender for work in neighbouring countries. As already predicted, demand was a major consideration determining the activities of firms. Where roots had been put down in countries, they sometimes reaped the rewards of being able to negotiate contracts directly, although competitor political associations and direct government interventions raised difficulties for many firms.

British firms were able to operate in countries of the world which were favourably disposed towards them. They saw strengths and future opportunities in specialist fields, whether it was technical projects or types of packages. This continues to be necessary to maintain competitive advantage because newly industrialised and developing countries will continue to reduce market opportunities in the price-competitive standard project realm.

5.24 APPLICATION TO THE STAGES-OF-DEVELOPMENT APPROACH

Knowledge that other British consulting firms were working abroad had the effect of encouraging expansion as did a low level of domestic construction. Initial moves overseas could often be unplanned and in response to an unanticipated offer. As was shown, consulting firms did not find the use of an intermediary agent to be very satisfactory and control problems soon became evident. Considerable commitment was shown to be needed at the top level in the firm as well as from those managers initiating and carrying through the work abroad.

The firms who worked in the international aid sector (i.e. predominantly consulting engineers) needed to pursue active policies by lobbying in the aid agencies, head

offices and regional offices. They seemed to be reluctant to rely on intermediaries to do this for them and chose to invest directly in offices abroad. Firms who were large in size clearly benefitted in being able to sustain this activity. Marketing as a discipline appeared to be fully evident only in the much larger organisations. Networking with other firms and other external links were regarded as a major importance in obtaining projects, particularly for consulting engineers and other professional groups.

From firm's experiences of consortia, it can be noted that the process is far from straightforward. Consortia provide the opportunities for semi-formal cooperation, which can act as a vehicle for internationalisation in certain medium-sized to small firms. Such firms expect to benefit from a number of angles such as sharing resources, accessing information, obtaining expertise on a wider basis etc, but in practice the behavioural side of the business often becomes uppermost in managers' minds (21) (22), in that firms see problems in cooperating in case they dissipate their expertise or cannot agree over the element of risk. However if and when complementarity exists and when one of the firms is in a position to provide a strong lead, then consortia might be a viable option, although it is more likely to be limited to the smaller range of firms. Further detailed discussion takes place on cooperative arrangements in the later case studies on technology transfer, but mostly these encompass cooperation via joint ventures (rather than consortia) with local consulting firms and government clients.

One theme of the Lamb Report (23) in the early eighties, and of the Overseas Project Board Report (24) in the middle of the decade, was the need for more networking across the different branches of British industry. In all geographical regions of the world, it cannot not really be argued that British contractors have been favoured when they come to bid for British consulting engineering projects. On the other hand, as was shown in Chapter 2, British contractors are not as well represented in the world's top listings as their consulting counterparts. It is possible that when British contractors do bid there is some margin in their favour, but this is still likely to be much less than other countries display in the consultant/contractor relationship. However it can also be said that with so many British consulting firms around in the world, there will still be a significant carry-over to other British firms, although when it comes to sub-letting or passing on of work this activity would appear to be very limited in consulting.

Whether this will occur in reverse from other construction groups to consulting firms any more than it has in the past, when they are involved in technology transfer projects, remains to be seen.

There were many indications of firms having perceptions of countries, which were favourable to their own nationality on cultural grounds. Psychic distance was seen to apply in the context of firms' connections, for instance with African clients. Most firms were able gradually to extend their influence, as was suggested in Chapter 3. Control of local offices gave access to vital contacts and information on up-coming projects, and some had moved to fully established subsidiaries. At times firms had leap-frogged the intermediate stages of internationalisation to a full office; alternatively they contented themselves with project offices or a loose joint venture arrangement. Joint ventures with host country partners seemed to be entered into either out of choice or as a result of the clients' mandatory requirements; sometimes advantage could be taken of cheaper local production facilities. Figure 5-1 gives an expanded picture of the routes to internationalisation, incorporating some of the technology transfer locations from Chapter 4.

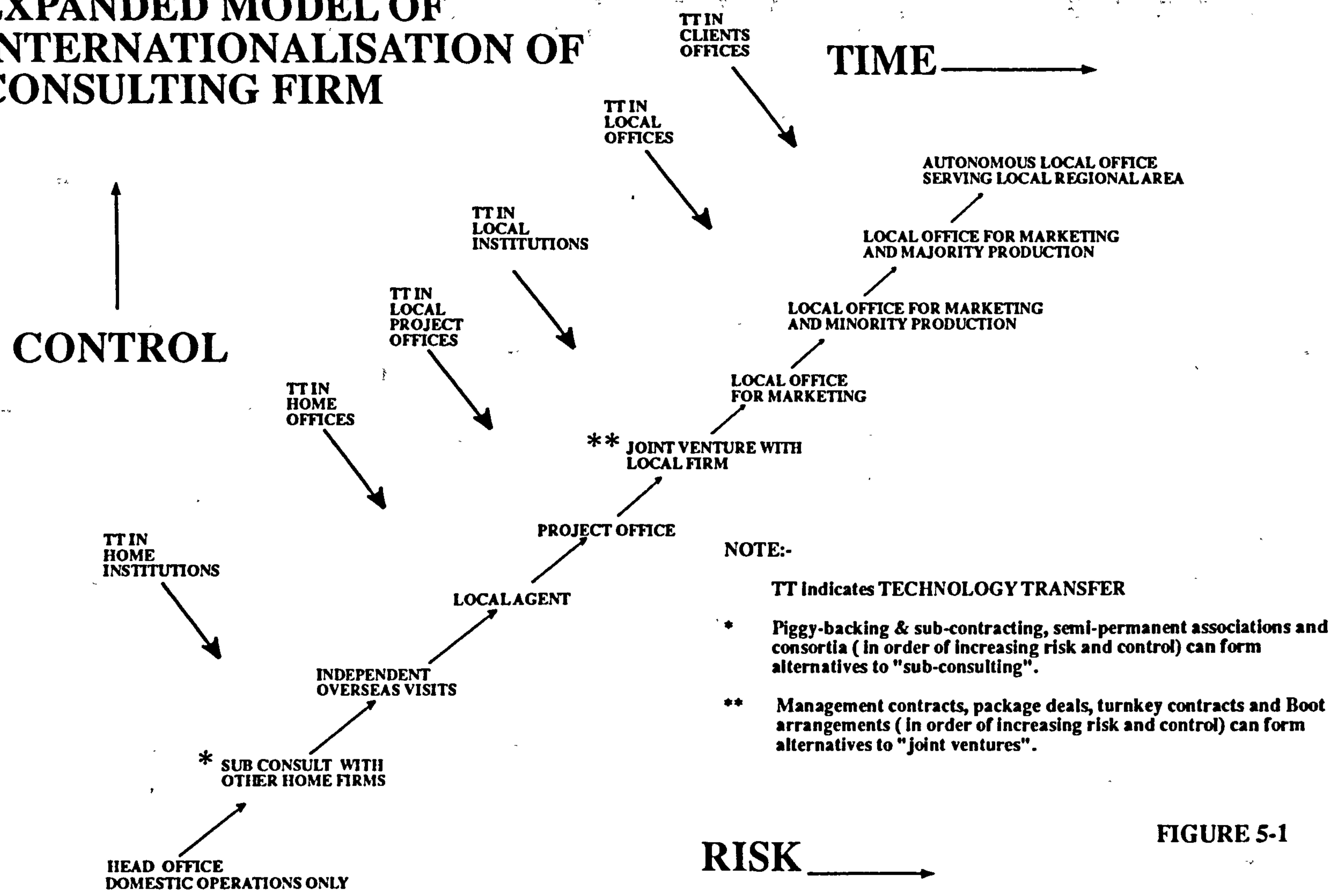
Firms had also come to be involved in various client fulfilling requirements. Turnkey contracts and "boot" offerings were being used successfully in some instances, although those firms, who were large in size and had extensive networks, stood to benefit more than smaller medium sized firms. More often than not, a training element in technology transfer was called for which had both its costs and opportunities.

5.25 APPLICATIONS OF TECHNOLOGY TRANSFER & LINK TO LATER CHAPTERS

Various means have been used by firms to obtain information on construction projects. Technology transfer projects may provide greater openings to access advance information in a way that might not otherwise be possible. Given the number of offices that many firms exhibit, this might also be obtained through their own local subsidiary offices or through joint ventures.

EXPANDED MODEL OF INTERNATIONALISATION OF CONSULTING FIRM

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SOURCE: Author

FIGURE 5-1

It is possible that the bidding success of firms could be improved were they to be more involved in this form of work. This could be an area for focus through differentiation as advocated in Porter's literature of Chapter 3. The experience of some firms in failing to impress clients and aid agencies through poor efforts at coping with documentation, suggests an existing arms-length approach, which might be improved through closer contact with clients via technology transfer projects. A common problem was a lack of understanding on the part of the host country client for the various construction processes, particularly those of an intangible design nature. Cultivation of a client through a closer relationship might be made more possible when technology transfer projects are engaged upon.

The problems experienced by some firms in financing the front-end speculative stage of projects may be alleviated by tackling the technology transfer type of project, which may suit some of the medium-sized firms. Their lack of international experience may not be such a hurdle in such cases and some of the risks of the traditional type of international project may also be less pronounced in such circumstances.

An underlying trend throughout has been that developing country clients are wanting to see their nationals working on their own projects. Technology transfer incorporates training and for this reason such host country firms are likely to favour cooperation with home firms. Aid projects seem to continue to present a number of opportunities in the technology transfer area. Furthermore, certain host countries appear to favour British methods in design and construction, which suggests a further opportunity for British firms.

The correct mix of staff in a consulting firm was discussed in Chapter 3. Some firms seemed to possess an insufficiently used pool of senior staff. Technology transfer projects could put these staff resources to better use. Since many of the staff are concentrated in home offices it might be possible to conduct some of the training there. Alternatively, it may be that firms' own subsidiary offices are a better location for conducting these projects.

More passing on of work may be engaged upon through technology transfer projects than has hitherto been the case. The link between the construction groups may be improved and enhanced through the operation of the technology transfer type of

project. Whereas there has been a suggestion of a flow of work from consultant to contractor on normal international projects, it may be that a greater amount of overseas work will flow from contractor to consultant as contractors take on this kind of work, and realise they have to pass on certain parts of the technology transfer element to consulting firms.

Where competitive tendering was taking place, the average success rate was only around 1 in 10, indicating a very costly process. Although price was the main reason for the lack of success in bidding, other issues were important such as project experience, client connections, political pressures and financial packages as well as the indigenization demands of developing countries. Any attempts by consulting firms, therefore, to differentiate themselves from competitors through such means as technology transfer projects, are likely to be a useful avenue and worth exploring. This facet of international construction consulting provides a basis for enquiry in the next few chapters.

REFERENCE FOOTNOTES : CHAPTER 5

- 1 For section 5.2, see MANSFIELD (88f) p 762-765
- 2 For sections 5.3 to 5.7, see MANSFIELD (88e) p 142-145
- 3 For sections 5.8 to 5.13, see MANSFIELD (86a) p 1214-1225
- 4 For section 5.14, see MANSFIELD (88f) p 765,766
- 5 For section 5.15, see MANSFIELD (88b) p 1-3
- 6 For section 5.16, see MANSFIELD (86a) p 1225,1226
- 7 MANSFIELD (86a) p 1225
- 8 MANSFIELD (88e) p 143
- 9 For section 5.18 see MANSFIELD (86a) P 1226
- 10 MANSFIELD (88b) p 4-6
- 11 MANSFIELD (86a) p 1218,1219
- 12 MANSFIELD (86a) p 1225
- 13 MANSFIELD (86a) p 1225
- 14 MANSFIELD (88e) p 143
- 15 MANSFIELD (88e) p 144
- 16 SAPIR (86) p 619
- 17 MANSFIELD (87b) p 1,2
- 18 MANSFIELD (87c) p 49-51
- 19 BODDEWYN (86) p 49-51
- 20 NIGH et. al. (86) p 69
- 21 MANSFIELD & ODEH (89) p 462-465
- 22 MANSFIELD & ODEH (90) p 472,473
- 23 LAMB (82) p 1-20
- 24 WITHERS (86) p 1-10

CHAPTER 6

HYPOTHESES AND METHODOLOGY

6.0 SUMMARY OF CHAPTER 6

1. Sixteen hypotheses are described under the headings of the nature and extent of technology transfer, types of project and firm, cooperative arrangements and long term implications of technology transfer.
2. Supporting literature is given on each hypothesis, drawn from the earlier theoretical and empirical chapters.
3. A personal interview approach allows greater flexibility than mail or telephone questionnaires. Interviews were 'structured to semi-structured' using a detailed questionnaire.
4. A case study approach permits a comparison in depth of a variety of different firms and situations.
5. Interviews were conducted mainly with directors of firms, partners or senior managers concerned with technology transfer projects.
6. Cases involved UK consulting firms, two overseas consulting firms, aid agencies, UK contractors and UK suppliers.

6.1 INTRODUCTION

After covering chapters on the construction services industry, theoretical literature, technology transfer material and empirical work relevant to the British consulting sector, it is time to make a statement of each of the hypotheses to be tested in the second half of the thesis. This is followed immediately by a brief description of the main authors from the first five chapters, who contributed to the supporting literature giving rise to each hypothesis. After this the methodology and case representation are described.

6.2 STATEMENT OF HYPOTHESES

NATURE AND EXTENT OF TECHNOLOGY TRANSFER

- N1)** Technology transfer involves more of the transfer of management "know-how" forming part of the total project system than of actual "technology" itself.
- N2a)** Technology transfer is a mandatory part of construction projects.
- N2b)** Technology transfer is encouraged more by the aid agencies than by the host countries themselves.
- N3)** Host country clients are not clear as to their requirements for technology transfer.

TYPES OF PROJECT AND FIRM

- T1)** The depth of the relationship developed with the client during technology transfer is related to the type of project undertaken.
- T2)** Technology transfer requires firms to become strongly service orientated.
- T3)** Firms cannot be "technology transfer specialists" alone; technology transfer has to be a by-product of their mainstream business expertise.
- T4)** Medium sized firms conduct technology transfer more satisfactorily than larger firms.

COOPERATIVE ARRANGEMENTS & OVERSEAS REPRESENTATION

- A1)** To conduct technology transfer projects, it is necessary to become involved in joint ventures and consortia.

A2) Joint ventures lacking organisational integration and coordination do not assist the process of technology transfer.

A3a) Fully established subsidiary offices are needed to obtain project business involving technology transfer.

A3b) Fully established subsidiary offices are needed to conduct technology transfer projects adequately.

LONG TERM IMPLICATIONS

M1 a) Technology transfer is a long term business phenomenon rather than a short term one.

M1 b) Technology transfer is profitable financially, in the short term.

M2) Technology transfer facilitates the gathering of market intelligence information.

M3) Technology transfer enhances opportunities for market penetration and market development.

6.3 SOME SUPPORTING LITERATURE RELATING TO EACH HYPOTHESIS

- N 1** Much of the literature in Chapter 4 addressed the subject of what technology transfer actually was: some of these authors were Abbott, Mordell, Contractor and Rodrigues.
- N 2** In Chapter 4, technology transfer was described as being increasingly necessary; the empirical Chapter 5 emphasised its ascendancy. Authors included Eldridge, Dickerson, Abbott and Adejumo.
- N2b** Similar literature queried which party was "driving" technology transfer. Chapter 2 also covered the matter of aid in construction; the main authors were Hajj, Ibrahim, and Dickerson.
- N 3** Intangibility and clarity were discussed in the sections on services mainly by Rushton, Wittreich, Rodrigues, Shivastra and Dickerson.
- T 1** Gardborn and Rhenman linked the project to the relationship with the client in Chapter 3; Coxe and Porter and the empirical Chapter 5 also referred to this.
- T 2** Strong service orientation was discussed in Chapter 3 by Coxe, Bloom, Maister and Schmenner.
- T 3** Aid agencies and others raised the subject of mainstream specialisms. Authors were Hajj, Al-Shehabi, Gardborn & Rhenman and Starr.
- T 4** Size in the firm was discussed as an issue in Chapter 3 and also in the empirical work in Chapter 5; some authors were Reid, Czinkota, Delacroix and Mascahrenas.
- A1** Much literature touched on joint ventures and consortia in Chapter 1, 3, 4 and 5. The main authors were Seymour, Dunning, Johanson and Sharma, Hennart and Porter.

A2 Integration in joint ventures was further raised by Armit, Berger, Dickerson and Eldridge.

A3a Subsidiary offices were all discussed by Seymour Dunning and Norman, Sharma; Cantwell, Enderwick and also the empirical Chapter 5.

A3b The location of offices to conduct work was mentioned by Adejumo, Davidson, Seymour, Starr, Dunning and Norman.

M1a Long term business was suggested by Abbott, Ahm, Joong-Woo, Starr, Sharma and Coxe.

M1b Frick-Meyer, Binger and Adejumo reflected on the short term nature of technology transfer.

M2 Berger, Buckley, Seymour and Ehrman all considered market information as did the empirical Chapter 5.

M3 Opportunities to penetrate and develop markets arose from Sharma, Johanson and Sharma, Dickerson, Gallo, Stoever and Wiedersheim - Paul.

6.4 : METHODOLOGY : INTERVIEW AND CASE APPROACH

The personal interview approach was used. This was more flexible than other methods such as mail or telephone and the response rate was likely to be far higher. By personal interview, a higher quality response is afforded and ambiguity can be avoided. The interview respondent is known and can be observed during the interview, although gaining access at a suitable and convenient time can present difficulties. Keeping on course, with a large number of questions, is not always easily achieved and the process can be slow. Ideally an interviewer is needed with some experience of interviewing. There also has to be an awareness of the problems of introducing any bias into recording the answers to the questions: The personal interview method is more expensive to mount than either the mail or telephone method but it is possible to ensure that access is gained to the right kind of informed source in the organisation (1).

The degree of structure in an interview refers to the extent that an interviewer conducts the interview with the wording format set out in the questionnaire.(2) The interviews that were carried out could be described as being between structured and semi-structured. A full questionnaire (see Appendix A-4) was prepared and this was followed throughout each interview, (the literature review having prepared the ground sufficiently well to allow this to take place). The interview was "focused" in that many of the questions were open ones in order to encourage the respondent to discuss the topic (3)

A case analysis was used in writing up the results. Such an approach permits a comparison in depth of a variety of different firms and situations (4). Far more detail can be recorded than with a purely aggregative coverage of a series of interviews. It is more possible to highlight responses to important aspects of the enquiry. Although the case study approach was employed, information was still gathered across all the interviews in order to test each of the hypotheses.

6.5 THE INTERVIEW SURVEY AND CASE STUDIES : DESCRIPTION

The interview survey was conducted with personnel from the organisations listed below. In answering the questionnaire contributors drew upon their overall background of experience on technology transfer projects. In the first instance a letter was sent to the firm/company concerned, followed up by a phonecall to arrange a suitable time for the interviews; these lasted on average for one and a half hours. There was a 90% response rate to requests for an interview. This high success rate was, in part, due to the early ground work covered by the author in previous studies (see Chapter 5). Interviews took place mostly between June and August 1989. The majority of these were conducted at Managing Director, Vice President, Partner or Director level; in order to obtain some needed information at project level some interviews were also carried out with project managers, business development & marketing managers etc. (see Table 6-1)

Cases were compiled across a variety of consulting firms and consulting related organisations. In all thirty two interviews took place, which have been written up under sixteen cases as described below. [The first twelve cases, related directly to consulting but in order to provide a measure of comparison with other parties in

POSITION OF PERSONS INTERVIEWS

	Director	12
	Partner	4
	Marketing Director	1
	Business Development Manager	2
	Project Manager	4
	Senior Partner	1
	Managing Director	2
	Commercial Manager	1
	Vice President	1
	Chief Aid Adviser	1
	Aid Adviser	1
	Contracts Manager	2

	Total No of interviews	32

Source : Author's interviews

TABLE 6-1

the industry, the last four included organisations associated with them in the international construction process]. (see Table 6-2). Details of the cases were as follows:-

Cases 1 to 10 : UK Consulting Firms

Of the UK firms interviewed, half were in the top 15 British international firms, in order of size by "overseas staff employed". The other half represented medium and smaller medium sized firms, many of whom had high percentages of overseas work including involvement in technology transfer projects.

Cases 11 and 12 : Overseas Consulting Firms

One of the overseas firms, from Canada, was the largest in the world. The other had a known involvement in "boot" financed technology transfer projects and was based in Singapore.

Case 13 : Overseas Client Organisations

The staff of many consulting firms are seconded to or are employed directly by developing country client organisations. This case charted the experience of technology transfer from the perspective of British expatriates who had spent an extended period, of 4 years or more, in an executive capacity abroad with an overseas client. Their secondments from existing consultants reflected a spread across the top 75 consulting firms as covered in Cases 1 to 10.

Case 14 : Aid Agency Organisations

Consulting firms deal with aid organisations, many of whom have been influential in formulating meaningful technology transfer projects. This case charted the aid side of the picture from the perspective of the ODA and World Bank.

CASES & INTERVIEWS

CASE NO	REPRESENTATION*	NO of CASES	NO of INTERVIEWS	NO of FIRMS/ORGA-NISATIONS REPRESENTED
1-10	UK CONSULTING FIRMS of which			
	Top 10 Consulting Firms*	3	6	3
	Top 15 Consulting Firms*	2	4	2
	Top 25 Consulting Firms*	1	2	1
	Top 50 Consulting Firms*	2	3	2
	Top 75 Consulting Firms*	2	3	2
11	OVERSEAS CONSULTING FIRM (CANADA)	1	1	1
12	OVERSEAS CONSULTING FIRM (SINGAPORE)	1	1	1
13	OVERSEAS CLIENT ORGANISATIONS	1	4	4
14	AID ORGANISATIONS	1	2	2
15	UK CONTRACTORS of which			
	Top 10 Contractor Firms	1	3	3
16	UK SUPPLIERS AND CG MANUFACTURERS PROCESS of which	1		3
	Top 10 Process Firms		1	
	Other Supplier Firms		2	
	TOTAL	16	32	24

NOTE* Top consulting firms are by overseas staff from Consultants File.

Source : Author's Interviews

TABLE 6-2

Case 15 : UK Contractors

Many contractors work closely with consulting firms on international projects. Some of these top British international contractors were currently engaged upon the construction of one of the world's largest current projects: the Channel Tunnel. Some of their senior executives and managers, with recent international contracting experience on a range of projects disciplines in developing countries, contributed to this case.

Case 16 : UK Suppliers and Capital Goods Manufacturers

Equipment suppliers & capital goods manufacturers interface in the networks with consultants, as do process and turnkey contractors. Three firms were represented, two of them being very large firms in their section of the industry.

The individual cases which follow in Chapter 7 expand in a detailed manner using the material gathered in the interviews. Each case is described under the same four headings as developed for the earlier hypotheses. (The term technology transfer is abbreviated to T T throughout).

REFERENCE FOOTNOTES : CHAPTER 6

- 1 HART S (89): p 14
- 2 TULL & HAWKINS (87): p 96-98
- 3 HART S (89): p 5-8
- 4 TULL & HAWKINS (87): p 31

CHAPTER 7 CASES

7.0 SUMMARY OF CHAPTER 7

1. Case studies on the subject of technology transfer (or T T) are recorded in detail in this chapter. They form a basis for the analysis which is set out in Chapter 8, when more of an overview is given.
2. **Case 1** covers a large UK consultant with roads, bridges and other T T projects in the Middle East, Africa and Asia.
3. **Case 2** covers a large UK consultant with roads and buildings T T projects in the Middle East and Asia.
4. **Case 3** covers a large UK consultant with roads and bridges T T projects in Europe and Asia.
5. **Case 4** covers a medium to large sized UK consultant with roads and water T T projects in Europe, Africa and Asia.
6. **Case 5** covers a medium sized UK consultant with roads and airports T T projects in Africa and Asia.
7. **Case 6** covers a medium sized UK consultant with roads, airports T T projects in Africa and Asia.
8. **Case 7** covers a smaller medium sized UK consultant with roads and urban development T T project in the Americas, Africa and Asia.
9. **Case 8** covers a large UK consultant with roads and rural works T T projects in Africa and Asia.
10. **Case 9** covers a medium sized UK consultant with dams and power T T projects in Africa and Asia.
11. **Case 10** covers a medium sized UK consultant with building and development T T projects in Africa, Middle East and Asia.
12. **Case 11** covers a large Canadian consultant with water and power T T projects in Africa and Asia.
13. **Case 12** covers a medium sized Asian consultant with water, power T T projects in Asia, Middle East and the Americas.
14. **Case 13** covers host country client organisations with roads, railways buildings and marine T T projects in Africa, Asia and the Americas.
15. **Case 14** covers aid organisations with irrigation, power, roads and railway T T projects in Africa, Asia and the Americas.
16. **Case 15** covers large UK contractors with roads, building, power T T projects in Africa, Asia and Middle East.
17. **Case 16** covers UK suppliers and capital goods manufacturers with mining, building process and power T T projects in Africa, Europe and Asia.

7.1 CASE 1

This case was conducted with one of the larger UK consulting engineers. T T projects covered Iraq, Saudi Arabia, Cyprus, Caribbean, Chile, Indonesia, Turkey, Yemen, Ethiopia, Somalia, Burma, India and Portugal. Disciplines involved highways, bridges, undergrounds, airports and water.

NATURE AND EXTENT OF T T

The type of T T engaged in extended to special courses for national staff in the firm's UK offices, employment in the firm's overseas subsidiaries, counterpart training on projects etc. The transfer in which most interest was expressed in technology itself was information technology and computer aided design (CAD), particularly for Asian countries. Experience was also gained in "the legal and accounting departments of the consulting firm" and in assimilating the "methods of running and marketing the business". Project management was a weak area for local consultants in the more go-ahead developing countries and they were most interested in acquiring know-how on letting contracts to international contractors. In the Middle East in such countries as Dubai and Saudi, the wealth of the individual was fostering a situation of "interest only in taking a share of the profits" rather than any serious learning about the technical or management aspects of consulting as such.

T T was seen as being an essential part of projects with most of the pressure coming from the client and there were very few projects where it was not offered by the firm. Many clients such as those in Turkey had become more informed and wanted to "gain as much as they could for a cheap price". Although projects might be funded by the World Bank in countries like the Yemen, there could be a difference of opinion over how the budget might be interpreted by the host country for sponsoring personnel for T T back in the UK. Often the T T was "vague and mixed up in the project undertaking". During a project, the World Bank were not always visible in the way that they followed up the implementation of T T. At the same time Aid agencies were seen to be addressing the wider problems of development by funding T T of an institutional and operational nature. In the area of water, agencies were sometimes turning to a water authority or management consultant for this type of service.

TYPES OF PROJECT & FIRM

Those projects which established the most in-depth relationship with the client were those with a high operational content. "Run-of-the-mill" projects were thought to be better here than "technically sophisticated" projects because the client could find himself out of his depth and be unable to communicate meaningfully with the consultant. Projects "involving basic infrastructure" were also seen to link in well to further contact with the client by way of repeat orders. In some Middle East Gulf States, it was still possible to be appointed a sole consultant because of a long standing arrangement with a ruler but this was rare. On short term T T assignments in the firm's UK offices, it was not difficult to concentrate a great deal of input in a short time and make a good impression with the client without it affecting the firm's on-going work. On the whole T T did not greatly affect the overall organisation of the firm partly because the client laid more stress on a satisfactorily completed project.

The firm had identified T T as a distinctive market and had produced a capability statement on technology transfer; this was wide ranging in nature in both the areas of expertise and flexibility offered and it notably included "institutional strengthening" and "liaison with university institutions". The firm did not see themselves as competing with academic organisations because they did not have access to lecture facilities and conference facilities at the same low cost.

Energy related projects were a recent market for the firm but they arose in the project side of the firm and were not linked especially to T T, although this had led to an extended programme of T T in a French African territory. The firm was able to draw upon its various specialisms from a multi-specialist organisational structure. Being a large firm there was added flexibility to enlist the firm's smaller specialist units each containing 50 or so staff. However, there were doubts expressed on the firm's actual effectiveness in coordinating these activities and it was felt that a medium sized firm might be "less tied down bureaucratically".

COOPERATIVE ARRANGEMENTS

The firm went "alone" into overseas markets where they could, but this was happening less than in the past and they were more likely now to be cooperating with other firms in a variety of arrangements. The nature of some projects required a joint venture because of the sheer size of the task, as for example on a jumbo project in the Middle East where other UK

consulting firms had come together in a UK consortia of firms. In another location the firm was joint venturing with a UK public sector organisation who were supplying hardware for an airport and they needed consulting services as part of a T T package.

As regards British contractors they had cooperated in South America when the firm identified a project first and then brought in a contractor and merchant bank to arrange finance. This was a new area where the firm was beginning to take a stake in equity, albeit small; a full stake running into millions of pounds was not really likely to be entertained very often however. British contractors were observed to be doing "more management contracting overseas than actual construction" partly because local entrants from third world countries had found it more easy to compete in some overseas areas, and the UK domestic market of the late eighties was far more of a draw than it had been. In spite of this the firm did not appear to cooperate much with other nationality contractors apart from the traditional relationship when they encountered them as main contractor.

The most common arrangement was to cooperate with local consulting firms, for instance in Turkey. However in Iraq, personnel from the government ministry were drafted into the firm's project office at intervals. In the Caribbean, national staff were recruited locally and employed on projects that the firm was carrying out in their own subsidiary offices. In other places, bidding proposals were mounted increasingly with local consultants, who were "able to discern more easily what the client most wanted". Competition was on price and costs were kept lower by using such firms. At times, as in Turkey, the local consultant would be a lead firm. The joint venture could be fully integrated or part of the project could be split off for the local firm to do. Either method seemed to work satisfactorily. A major concern of the firm was to send out sufficient UK core personnel to be sure of running the project, should those provided locally turn out to be of doubtful competence.

Subsidiary offices were less important than they had been in the past for obtaining new work. Although the firm had a large network of offices, they were still thought to be necessary as a selling point to impress new clients regarding their global operation. Although they possessed some two dozen offices and had worked in over 50 countries, market development reports were forthcoming from only a handful of them. This was partly because those manning the offices were taken up with progressing existing project work. An association with a local consultant or agent could cut down on the costs of a subsidiary office and in many cases this was just as effective. If it came to providing only UK people on a project, the work could be done with equal facility in the client or local consultant's offices.

LONG TERM IMPLICATIONS

As regards the long term, T T was seen as a "soft marketing mechanism". Where special courses were offered through the British Council, it was hoped that consulting commissions would be obtained at a later date. Continuity was not assured on such courses because they had come about as a result of a request to bid along with other UK consulting firms and rotation of firms on such ventures usually occurred. T T was generally considered as a cost to the firm and was not profitable.

Self sufficiency was occurring in those countries, where there had been the most T T at University degree level. In other parts progress was far slower, the "rate of technological change effectively being so rapid" that there was "little danger of any threat to business". TT did not always lead to much close contact with the client because of the current seniority of those being trained. However where there was a language barrier, any contacts were of particular help and a greater openness was created which made it easier to hear about future work. T T also removed impressions from client's minds that the firm was "in their country to make quick money"; instead they were seen as contributing to long term development and permanence. Projects which were "high-tech, complex or requiring finance" were likely to be in demand for some time to come, even if some countries were showing signs of using the consultant as a design contractor. "Boot" arrangements, for those prepared to risk capital, attracted much higher margins than normal, sometimes 10 or 15 times those achieved on cash projects.

There were some difficulties in extending into new country areas. If a part of the firm with a reputation in one discipline brought in another separate part of the firm to deal with a project in another discipline, the existing relationship with the client in that country could be damaged and influence lost. Multidisciplinarity operating on a global basis was seen as being theoretically possible but there were often barriers to this within and without the firm. Too much centralisation in the organisation of a consulting firm was reckoned to hinder the process of expansion. Those firms which had encouraged a fair degree of decentralisation were seen as having been in the better position to take advantage of the market as they found it in different regions.

7.2 CASE 2

This case involved one of the larger UK consulting engineering firms. Information was provided from a background of projects involving T T in Iraq, Turkey and Pakistan under the disciplines of bridges, motorways, transportation and buildings.

NATURE AND EXTENT OF T T

On some projects T T was not mentioned in the terms of reference by the client and it was not then offered by the firm. T T could develop into a costly process for the firm and it was not always expedient to charge the client the full cost of the service. Clients for the most part provided a clear description of what T T they wanted, examples being the "provision of experts on dredging, project discount appraisal etc." and this was usually linked to a particular project. It was generally held that T T should be conducted where the project was being designed and it was seen as a process which was common across the regions of North Africa, Middle East & Pakistan. Foreign personnel at the early to mid career stage were being brought to the firm's UK offices to learn the processes of bridge design for periods of up to a year or more. This had the added advantage of educating a member of the client's staff as to the complex nature of the firm's work because someone in their organisation had witnessed the ramifications of the design at first hand.

On large projects, £250 million in size, the works were designed within the country in the Middle East on a design and construct basis with computers being installed in client offices. Half the staff assigned to the project were nationals; for follow-on projects, it was anticipated that the national input could increase to three quarters or more, the same proportion as on one of the firm's current transportation studies in Pakistan.

TYPES OF PROJECT AND FIRM

The deepest relationships had unfolded on those projects which were "lengthy by their nature". A useful rapport was established through T T; up till then the firm might be known to a client's staff at a distance but T T made them "well known and close at hand". Where clients' staff spent an extended time in UK offices, a mentor style relationship between the partner-principal and national often resulted.

T T involved a fair amount of individual supervision but the numbers being handled at any one time were not large. Taking into account all the varieties of T T, the firm was able to take the T T process in its stride without it affecting its main productive work or administrative organisation.

The bulk of the work, occurring in UK offices, arose from domestic UK projects. The firm's well established subsidiaries seemed to be given a sizeable degree of autonomy. It was company policy to recruit from within from a select number of UK universities but shortage of graduates was making the firm consider widening the net to include some from overseas, however employment regulations were presenting some stumbling blocks.

COOPERATIVE ARRANGEMENTS

Relationships with other organisations usually included links with local consulting engineering firms, not only because governments insisted upon this but also because the firm could assess the country's local conditions and standards better. They often bid together with these firms and in such cases usually chose a firm with a similar discipline and of sufficient size, and with both professional reputation and political influence. There could be amalgamated project teams or separate parts of projects could be split between each party's offices in the country. When T T occurred on these projects it invariably slowed down the pace at which the firm could work. On occasions in the past there had been cooperation with a French contractor in undertaking a project. As a result, they now worked significantly with six other French contractors and had opened an office in France. An enquiry for cooperating on a building project in the USSR was also being received from a non-British contractor.

Participation in equity had occurred very little on the projects covered by UK head office, but they were able to draw upon experience of equity sharing from the Australian subsidiary for the past 5 years and information on this could be usefully disseminated across the group. Property developers were looking to consulting engineers to share in equity by putting up fee commissions "free of charge" but money could not be easily borrowed due to ACE restrictions.

Where the firm was serious over winning work in a country, it usually set up an office from which to work. About 5 % of the directors in the UK were foreign nationals, although it was a

much as half in their Far East office and it was higher again in Australia. Less than 2 % of UK staff were foreign nationals but in overseas offices this proportion was far higher.

LONG TERM IMPLICATIONS

Recipients of T T in the firm's view, usually returned home extolling the virtues, skills and calibre of the firm's staff as well as its computing facilities. All this made it easier for the firm to sell itself in a country in the short and longer term. In spite of this, upcoming market information was not derived during the process of T T as such. The benefit of information exchange with the client often came much later, at any time in fact when they chose to call upon the client. However each client looked upon any commission on a "project by project" basis and the firm's hope and expectation was that they would be given the benefit of the doubt when matched against competitors. Some of the previous recipients of T T had returned to set up their own local firms in Nigeria or joined another firm as a partner in Pakistan; in both cases this had led to joint bidding on later occasions.

While T T was seen as "passing on the skills of the trade", local firms usually did not set their sights very high, concentrating instead upon smaller works such as general building and public housing. Since the firm had made a "decision not to chase low technology work", there was no real threat from local competition. However the firm did see some signs of self sufficiency in countries where they worked but it was taking place gradually.

7.3 CASE 3

This case was conducted with a large UK Consulting firm. T T projects in Bangladesh, Greece, Thailand, Papua, Singapore and South Korea provided background for T T in the sectors of bridges and roads.

NATURE AND EXTENT OF T T

T T was occurring for overseas nationals who were brought back to the firm's UK offices. The firm's personnel also supervised the design and construction of projects in the host country on World Bank, ODA and host government sponsored work.

Clients were interested in sophisticated technology related to complex bridges, welding technology and prestressed work but, more often than not in Central Asia, it was the transfer of practical experience in interpreting codes, giving overall confidence and learning to make creative and weighty decisions in design.

The main push for T T came from the aid bodies, if they were involved, rather than the client. The World Bank, ODA and Scandinavian aid agencies were the most keen with the AfDB, ADB and Arab banks being less so, with little interest detected from the EEC. Any pressure was usually stated in the terms of reference which required "steps to be taken to implement T T" which left it up to the firm to find a suitable expression for this. To operate abroad at all, it was seen to be essential to work with a local organisation, in most cases, and it was assumed that T T would then be built in to a project. However the firm usually offered T T anyway if only to protect their reputation, because they were then able to go some way to ensuring that their projects did not deteriorate when the time came for the firm to hand them over. Some clients simply expected T T to be "bolted on to the back of a project" rather than being an essential part of it. In other ODA projects such as those in Central Asia there had been a great amount of trouble taken by the firm to set up programmes of realistic learning, so that host country staff could assimilate what was going on at all stages of the project, with seminars frequently being used to supplement the process.

On a World Bank project, some dozen personnel had been brought back to the firm's head office where courses and visits were arranged. In a period of 3 months the recipients stood a better chance of being receptive than in shorter bursts. Usually clients wanted far more T T than aid agencies were prepared to pay for. Much more T T would have been imparted if the

funds had been allocated to cover it. Some of the T T on very large projects was not totally relevant to the client's needs because "such very large bridges would be unlikely to be constructed again" but the client was still keen to see this kind of transfer. Smaller projects were also the subject of a direct T T package where the relevance to an on-going capability was more likely to be achieved. The firm seemed to be going to considerable trouble to ensure that this occurred. It was also advocating that clients and agencies should commission an institutional appraisal of their situations, addressing their own "hierarchy of needs" which had to be satisfied. Invariably the terms of reference were not always homing in on the right target. In less developed countries, some clients tended to have only a vague notion of what they wanted and usually they did not understand the T T involved a "clear commitment on their part" to make it work. The project objectives needed to be clear and if the client was serious about T T, it was better designated as a "T T specific project" rather than a "build project". Further inappropriateness arose with local persons being nominated for T T, who had other responsibilities to attend to in the period of the project or with people being allocated to computing training, for example, when they had insufficient background to reap the benefit. Some persons looked upon T T as "an extended holiday" particularly when they came to the UK. Clients were sometimes seen as being too rigid in their staff specification in requesting UK personnel, in Korea, for example, with 40 years experience when younger bright individuals could do just as good a job.

TYPES OF PROJECT AND FIRM

Projects most likely to provide opportunities for in-depth relationships with the client were those which had to involve the "management of the maintenance operation", as on roads. "Organisationally complex" projects also gave a good interface. While certain parts of the firm did not admit to any great change to its structure and staffing, T T was fully occupying this staff at certain stages and placing demands of training and seminar preparation upon them in addition to the more usual role of design and construction. On the same large aid project when host country graduates and postgraduate personnel were sent back to head office for T T, it seemed to stretch the resources of that part of the firm to the limit and involved the rescheduling of other productive work.

From a strategic perspective the firm had recruited new directors into another part of the firm to head up a developing unit to expand the T T side of the business in the area of institutional development and technical advice for clients. The firm saw itself in the service area but not to the exclusion of the delivery or idea side of consultancy. Notwithstanding

this development, the aim was to concentrate on areas "where the firm had its main skills". They reckoned to recruit in new expertise or progress towards attaining this through internal development. Larger firms were the better placed to provide a T T service to clients, even if they chose to operate in smaller almost watertight subgroups under their own directors. Medium sized firms were seen to be able to concentrate usefully on a narrow range sometimes and do it well, in the firm's view.

COOPERATIVE ARRANGEMENTS

For some years the firm had worked in association with local host country firms. Often the client required this to happen, as in Greece. It also had advantages for the firm by providing a local base and a source of local knowledge. The term "association" was understood to describe a situation of partnership with a local consultant where the firm took the major responsibility as for instance in Central Asia. A "joint venture" suggested more of an equality with a legal responsibility to perform, incumbent on both parties. Sometimes local consultants could become assigned to the firm by the client in a very unplanned fashion without being known to them first. As regards arrangements leading to equity involvement in projects, it was the firm's policy to take a share in some countries for business reasons as part of a planned policy. The firm had access to its own sources of finance on account of its structure and part of the group had concentrated on putting together financial packages.

As regards subsidiary offices it was more usual to have project offices from which the market situation could be observed but a local presence was also afforded through local consultants. If a client was truly serious about T T, "the firm's office would be in the client's offices"; T T had been carried out very effectively this way. T T could be conducted successfully by using courses at UK establishments and universities provided course and personnel were properly matched. The technical and business content of courses was not the only factor: senior personnel if working in the clients UK offices could benefit greatly from learning to operate in a managerial culture. Where design work was split between UK and host country offices, the case was usually put to the client to show how the work could be done most cheaply. Clearly the preference was to do as much as possible in the home offices. Cost constraints suggested that "high tech elements of the design process" be done in the UK offices since access was available to computing information and staff know-how. "Low tech parts of the design using host country personnel at one fifth of the cost" were done at the project end. It was further noted that it was cheaper for the client to work

through a local associate and minimise its currency dissipation by not paying fees outside the country.

The firm had a substantial number of different nationalities working in its head office but very few non-British directors. Some of the foreign staff came to the head office on projects after having worked before with the firm as host country nationals on T T projects. Others were now representing the firm in different but similar countries, where they proved an asset in managing T T projects. The firm had a current policy of recruiting one in four of its graduate intake from foreign nationals, many of whom had attended UK universities; this was a conscious plan to gain influence in territories when personnel returned home.

LONG TERM IMPLICATIONS

As regards T T being a long term investment for the firm, some parts of the organisation saw a gap in the market on T T related work and they were approaching this actively. It was also felt that by doing T T, the firm would be enabled to carry out "its traditional engineering function more effectively". It also allowed the firm to do a more thorough job, give clients more satisfaction and end up with a better all-round project when completed. Other parts of the firm, with considerable current T T involvement, felt that they were "doing it because they had to". That was the way the consultancy business had gone in the eighties and "they could not buck the trend". If their firm did not do T T, some other competitor would. Nonetheless T T was still seen as an activity which enhanced the firm's reputation and helped to give an edge in a short-listing situation. T T was regarded as profitable but it had to be carefully watched. It was "closely aligned to public relations" and it was possible easily to lose out during the process. T T was "hard to sell at the price it was worth" because clients were not that willing to pay for the senior staff that T T required.

Countries such as Korea were seen to have achieved a good measure of self sufficiency and they had learnt quickly when the firm had worked with them. In other countries it was a much slower process. Through T T, greater interaction was possible with the client because it simply was not possible to be isolated from them; the firm's staff met far more of the client's decision makers and those who influenced them. Better understanding with the client was created, which was "at the heart of the consultant's service".

The chances of hearing about further work were increased through carrying out T T projects, mainly because the lines of communication between the parties involved became less

formal. A track record in previous T T work in another country was useful when the firm sought to enter a new market in similar T T work. One of the Ironies of putting a good T T package together in a bid situation was that it tended to increase the price of the project, which was not a very favourable attribute if the decision was made on price sensitive grounds.

7.4 CASE 4

This case was carried out with a medium to large sized UK consulting company. Projects were discussed in relation to roads and water projects in Pakistan, Sri Lanka, Bangladesh, Greece, Kenya, Tanzania, Zambia and Uganda.

NATURE AND EXTENT OF T T

T T was understood to refer to the "transfer of management and technical know-how" almost all of the time rather than "hard technology" thus reflecting the staff intensive nature of consultancy. In the hard technology situation, it had involved the arrangement of deliveries of British-made computer equipment to accompany the software that the firm had developed. Know-how also encompassed experience in computer techniques, knowledge of research in civil engineering products as well as the provision of additional capacity that the client (often African) did not have in sufficient measure.

T T was not seen to be mandatory although it was becoming more and more of a requirement but the firm always suggested that the client included it; overall it was also seen as being "good for Great Britain Ltd". There was more or less equal pressure from both the client and the aid agencies. The World Bank, EDF, ADB and AfD encouraged T T to the same extent. By the time the firm became involved on a project, the aid agency had normally paired down the extent of T T that they were prepared to pay for, but this did not stop the client trying "to add bits back in again". On the whole the client's T T specification was "wooly" and it was up to the firm to be present around the client's offices in order to discern where the gaps were that needed most attention because this inevitably influenced their subsequent success in bidding for projects. Sometimes requests for computer applications in parts of Africa were inappropriate on account of the limited power facilities. This was a "sensitive issue and the firm had to tread carefully" in recommending alternatives. One anomalous factor on some projects, such as in Uganda where German aid was involved, was that the "locally assigned personnel did not turn up". The explanation for this was that each national often had to have a second job in order to supplement income from a low government salary and this could take priority. The same happened elsewhere on a World Bank project, when local staff did not materialise to receive training on the operation of a pumping station process plant.

That aside, the firm had had healthy experiences of foreign nationals coming to their UK offices to work for periods of training of up to a year on specially funded packages through the British Council or through the T T side of on-going projects. Generally this worked out well and incoming staff made a productive contribution to the consultancy's work output. 40% of the firm's staff were abroad and of these 80 % were nationals. This suggested that the firm was used to working through the medium of host country staffing, had geared itself to providing know-how exchange and was taking advantage of it as part of its business. Counterpart arrangements on projects in Africa were frequently conducted by the firm; this could involve one third expatriates and two thirds local nationals.

TYPES OF PROJECT AND FIRM

The firm had moved steadily to become more service orientated as a consequence of T T but they saw this as their own intuitive and natural response to the way that consulting had developed in the late eighties rather than any conscious move. They had however structured their organisation with separate units to oversee T T so that it could be given a sufficiently high profile in the firm. Furthermore there was a clear statement in the company policy objectives that T T would continue to be emphasised in the company's work, as well as aiming for projects with a rate of return above a certain threshold. The firm aimed to train up from within in the knowledge that (even with a new British graduate intake) they would lose half of them to other firms in the first few years, while at the same time gaining others. In view of the shortage of UK graduates they were looking to overseas personnel from third world locations to supplement their UK head office staff. The company concentrated on offering T T in their mainstream areas of expertise but they had also bought in expertise at Director and lower levels in order to move into the agricultural sector in which they saw a future market.

Small and medium sized firms were regarded as being likely to have difficulty in accommodating those who came to their firms for training. If a firm was trying to train more than about 10 % of its staff it would soon become inefficient on productive work. For example a small firm of 60 staff would find half a dozen personnel a near excessive burden, if those to be trained were assigned all at the same time.

COOPERATIVE ARRANGEMENTS

The firm was in the habit of joint venturing with many local consulting firms and other groups; sometimes the reasons were cheaper local costs. In Bangladesh because there were local consultants they worked in the lead with them. In Greece they were called in as sub-consultants to national firms because the client and the World Bank had demanded a certain level of managerial and technical competence which was in short supply locally. T T tended to occur "informally and naturally" as a result of working together on a project. Where personnel came from a client organisation, T T had to be more formal.

The firm tended to work with some half dozen British contractors in cooperative arrangements on projects which were aid funded by ODA or funded out of ATP. Usually other types of cooperation with a contractor were on a design-and-construct basis, which suggested the contractor would turn to its own home consultant. Contractors usually headed up any turnkey ventures and the firm was not often called upon to raise finance. Nonetheless there was "access to good financial advice" and the finance arranged on a project in Pakistan had been identified by the firm. There was a lack of call for any equity involvement in Africa because clients were in the public sector and were not much interested in sharing ownership with incoming firms. The firm found it convenient to work with a French consultant when working in Vietnam and it also turned to Canadian expertise which was strong in another country in hydro-power generation.

In most countries, the firm operated through their own offices and saw it as "very critical and part of their philosophy for obtaining work". There was no hard and fast rule on where they worked in conducting T T: this could be conducted just as well in host country client offices but computing related activities were usually better conducted in the firm's home UK offices.

There was no doubt in the firm's mind that T T was a sound business investment. T T was also reasonably profitable provided it was operated properly. It was advantageous in the short term bidding situation because the quality of the T T component gave the firm "more points" when bids were announced. Ideally any project proposal would be evaluated on the two envelope system with the technical proposal being assessed first followed by a check on the price of those bidders who had passed the first hurdle. While this was not necessarily always followed, it was important to pay attention to quality of the firm's staff offered for a project and therefore for the T T; "top class managers could get the job" in the firm's experience.

LONG TERM IMPLICATIONS

In the long term there was considerable benefit through T T and it was seen as a "useful marketing tool". Business was flowing back to the firm on the basis of contacts made directly through T T in earlier years. Several people, who had been trained by the firm in the past, were now in senior technical and administrative positions in client organisations, although this did not always yield fruitfulness right away. Nonetheless they were used to "walking down corridors in client's offices abroad" and seeing people they knew through their previous T T endeavours. All this made it easier to find out about upcoming project work. The top dozen men in one African country's public works ministry were known personally to one of the company's UK directors and many of them had been past recipients of T T from the firm. Further afield, another individual had left to take up a senior position in an Arab aid agency which was seen as another useful contact point. In spite of all these links, clients in Africa were regarded as being suspicious of long term relationships with any one firm, partly because of the colonial era. In any case so many projects were aid funded bilaterally that these clients were used to dealing with a succession of French, German, British or Scandinavian aid agencies who each had a list of their own home consultant firms. Few of these British firms "could keep a clean copy-book" with the client and this also contributed to a natural rotation.

T T enabled the firm to "give more guidance" which led to a better informed client, which in turn "cost the firm less in misunderstandings". Little threat to UK firms was seen to arise from client self sufficiency because most developing countries were so far behind; their "paths were diverging" with accelerated technological development. The firm usually found itself judged on its experience in a given region and it had experienced little difficulty in moving from one neighbouring country to another to carry out further T T projects, particularly in Africa.

7.5 CASE 5

This case concerns a small to medium sized UK consulting firm with projects involving T T in Turkey, Sierra Leone and Indonesia in the area of roads and highway transportation.

NATURE AND EXTENT OF T T

T T covered the "capability to manage projects, translate designs into realistic programmes and supervision of international contractors". Within this, the latest engineering techniques were offered such as information technology databases. T T was mandatory in Asia but not in Africa; the pressure for its inclusion usually came more from the client rather than the aid agencies. T T was often implied in a project rather than spelt out in detailed terms. Where an aid agency was involved it was a matter of clarifying the terms of a bid document already formulated. Although there had been much criticism of aid agencies, the firm's view was that agencies' system of evaluation in field study and assessment "brought them very close to the needs of the country" and they could sum up a situation very well. In the firm's experience, the ODA was sufficiently vigilant in on-going progress visits and quarterly reporting.

Inappropriateness on projects was ascribed to certain Middle East & North African countries where money had been spent lavishly on prestigious road projects, often linked to military purposes, when it was clear that other parts of Africa coped with a much cheaper form of construction. Sometimes the wrong sections of client's organisation were put forward for T T on account of patronage but this was really of little consequence since the top 10 % of the population were the only ones who were likely to be able to benefit. There was a marked difference in the approach of the firm towards T T; it varied according to the development of the local construction sector in the different continental regions where the firm worked.

TYPES OF PROJECT AND FIRM

Maintenance related projects promised the best in-depth contact with the client because they were continuous. While one-off projects such as dams or ports seemed at first sight to offer little follow-on work, port extensions did arise and dams needed attention when they silted up. The firm saw themselves in the "strong service" and "strong idea" category in their international work. Under the latter they were always developing new ideas for projects. They worked in their mainstream area of expertise but used the developments they had

made in data-base information technology to advance their cause with clients. Their overseas operation, was about a fifth of their workload and was run as a separate profit centre, which seemed to allow them to experiment more easily in the way they approached T T business with overseas clients.

In Asia, they had personnel working in the University sector developing highway courses and training staff in the government ministries there. They were also beginning to establish reciprocative links with British universities to work abroad in the same manner. Cooperation was also underway with a British bank, the firm providing evaluation on the feasibility of projects abroad where the bank had an investment interest; in turn the firm was also feeding the bank with new ideas for projects. This sort of approach had also borne fruit abroad when they had visited client ministries regularly to perceive their needs for T T, then written proposals almost to the point of writing their own terms of reference. All this made them the favoured firm when the project go-ahead was given. However they observed problems here if local elections in the country ever changed decision makers overnight. Some contractors had invested considerable sums in "palm-greasing" before they had seen contracts signed and delivered, although this was not the firm's style of working. The firm was also formulating proposals to bring personnel to the UK for University courses by tapping into British Council funding. On another occasion they had actively approached a British aid agency with a proposal they had put together with a client but were "horrified when the same terms of reference were sent to several other UK consultants". They ended up losing the job to another UK firm but had the satisfaction of seeing their own key personnel used on the work upon the client's insistence.

The firm was of the view that small to medium sized firms could undertake T T projects more than satisfactorily and would probably be most "likely to offer something high tech". It was felt that aid agencies favoured larger firms with whom they had already worked before. Very small firms were seen as being unlikely to cope with the handling of T T overseas projects. Larger firms were noted to suffer from too rigid bureaucratic procedures which affected their ability to respond quickly to a client or subconsultant's need.

COOPERATIVE ARRANGEMENTS

The firm preferred to work alone and, at that, to work on UK aided projects. Outside this area it recognised the need to form a joint venture with a local firm although in West Africa the firm was working solely with the government in an integrated arrangement and there was a virtual

absence of a local consulting sector there. In a joint venture arrangement in the Middle East, there was a measure of integration. Here the firm had been brought in because the government had run into difficulties with their own national banks who had defaulted on the performance bonds for a large project. There was a formalised business arrangement with the local consultant as a quasi-equal partner but little effective T T occurred to the local firm because the partner "did not accept any need to benefit"; the pressure came very definitely from the client government in that situation.

The firm found it expensive to operate a speculative office abroad. At first they tried to secure a project by regular visits, then they set up a team when they landed a project. The personnel they had working abroad on T T were constantly on the look-out for further work. They usually found themselves operating out of an existing client's office. Extending their influence to other clients in this situation was not very easy, although it depended on the "relationships between individuals" in the client's organisation in the country concerned.

T T could be carried out in the host country or in the UK but with different effects. National personnel "benefitted greatly if they were taken out of their home environment" to the UK. In host countries, the most promising personnel "with imagination and ideas" were usually those who had spent a period in Germany, USA or Russia. Alternatively there was equal value for the firm who was able to go into a host country, see the problems at first hand and assess how T T could be tackled locally.

LONG TERM IMPLICATIONS

The firm saw T T as a long term basis for developing relationships with the client, although the profit margin was limited compared to current domestic work in the UK, partly because rates were often fixed for the charges that could be made on expatriate experts sent into a country. Cutbacks in the British Council on education of foreign personnel and spending cuts on the overseas BBC world service were "far too short sighted", because those on the receiving end would always favour British firms such as their own.

Self sufficiency was very far away in West Africa and it was probable that aid projects, aimed at strengthening public sector organisations, would not achieve anything like their objectives in the first round. Developing countries were seen to "be advancing in stages of stepped development". They would be likely to go on buying in what developed countries

had developed for some time, although there was a greater chance of opportunities being switched off in Asia than anywhere else.

T T certainly enabled the firm to be in contact with the client at the highest ministerial level where their advice was sought and where, as a consequence, they could write meaningful proposals to implement further T T with the client's full participation. This was more effective than operating at arm's length and trying to "second guess the client's intentions".

T T gave opportunities for hearing about further project work with extension into neighbouring countries, but it could also lead the firm into a project management role where it would be supervising other firms, thereby excluding the possibility of further more direct activity in the short term. The firm had experienced a similar situation in the UK. However all their overseas involvement seemed to add to their credibility with British clients who held a "special respect for a consultant with international work". Consequently the firm had found themselves more favourably regarded on UK domestic projects. In working abroad, the firm chose not to use lists of curriculum vitae (CVs) of agency staff to bolster its image in the eyes of clients in order to attract further work; it considered that firms who worked that way abroad did not advance the cause of good T T or their own firm's reputation. Altogether, T T was proving a useful way of accessing new overseas markets for the firm and it was taking every opportunity of small assignments abroad because these led on to incrementally larger appointments.

7.6 CASE 6

This case covered a smaller medium-sized UK consulting engineering firm. Projects from Botswana, Zambia, Ivory Coast, Sierra Leone, Nigeria, Thailand, Malaysia, China and the USSR were used to expand on the firm's involvement in T T mainly in the disciplines of roads, airports and transportation.

NATURE AND EXTENT OF T T

T T involved training on projects in "professional and practically related design and construction work". While T T was now mandatory on nearly all projects, the firm had always offered it. Most of the thrust for T T came from aid agencies. The EEC and EDF were seen to be not at all disposed towards applications from British based firms. Where this had happened to them in the past, their strong relationship with the client had led to their being put back on the list. For World Bank jobs, the client normally prepared the list of firms for bidding which the Bank then approved. T T was usually "defined in its scope in general terms only" but it was up to the firm to flesh it out with an attractive proposal to win a project. This would be judged on technical appraisal, CVs of staff, local experience in the region and the firm's reputation. The quality of expatriate staff and their CVs were highly crucial. There could be a conflict here in trying to achieve maximum involvement of local staff on a project while at the same time providing expatriate personnel to effect the process of T T and strengthen the project. A major problem arose with aid agencies and clients insisting on personnel with many years of experience (sometimes aged over 50). When the project was eventually awarded after a time lag of, say 6 months, these people had often been redeployed and the firm was left to find replacements on the basis of the earlier detailed specification; this was very hard to achieve. Nonetheless, the firm did not believe in including CVs in a proposal if the person concerned was not actually a member of the firm as some competitors were alleged to be doing.

TYPES OF PROJECT AND FIRM

The depth of the relationship with the client was not linked to any one particular type of project. The firm seemed to take T T as part of their normal way of working and made use of local staff on their projects even if this meant working more slowly. More than half the firm's staff were based overseas of which three-quarters were local personnel. The actual term "consulting engineer" was seen as a misnomer in their eyes, because the client "invariably

had a fair grasp of what was required" but could not produce the people to make it happen, which was often where the firm came in.

T T was conducted in known areas of expertise. Medium sized firms were regarded as being better able to give a quality of service in T T because national individuals being assigned to the firm would not be "shunted to the back of a large office" but would receive personal attention at the outset from senior principals in the firm.

COOPERATIVE ARRANGEMENTS

In many of the East African countries in which they worked the firm was regarded almost as a local firm. Because the firm had strong roots in East Africa, this yielded them "more points when their proposals were evaluated". If they were able to joint-venture with an indigenous firm, this gave an added edge of 5 % to 10 % advantage in price over another competitor.

The firm was active in joint ventures with local firms, usually on an ad hoc basis. Where they had entered into a permanent joint venture in one African Country, it had to be revoked because the local partner spent too much time on farming interests; the firm's own resident manager was installed instead which was amicably agreed upon. Joint ventures also enabled the firm to come closer to client ministries and decision makers; the fully integrated arrangement was preferred. The spoils of the venture were shared equally but the firm usually picked up the bills for any losses. Never in the firm's experience had the local partner ever helped to collect payment of fees from the client. It was a struggle to collect debts from some African government clients but, whenever this happened, the firm made it clear that they were a professional firm and they could not continue with the client's current work until they were paid. Some debts had had to be written off in Nigeria.

The firm was also involved in a package with a multinational equipment supplier and with a commercial bank who provided finance and this was leading on to another bid in the Soviet Union. They had avoided any equity participation but it was noted that in Zambia there could be barter deals of payment in kind: one Hong Kong textile company had been remunerated with ownership of land, which it then farmed on the understanding that half the crops were made available for local consumption with the rest going to export.

From the mid eighties with UN sponsorship, the firm had become active in heading up an international consortia of firms from the developed world and from the African local sector

with the aim of carrying out projects throughout Africa. Member firms paid a levy each year until profit was achieved. A range of local consulting firms from a wide number of African countries had a stake. Because of the different African political systems in existence some of the local partners were private sector, some semi-government and some linked to Universities. The handful of developed country firms came from different European countries. The idea of the consortia was to transfer technology through undertaking UN sponsored projects together, so that local firms could be active alongside more experienced Western expertise. A few projects were underway and the firm saw it as advantageous in leading to work throughout Africa. Through its contact with this financial sponsor, further funding had been uncovered which it had not previously known about.

T.T was always carried out in the firm's own offices in the host country except when the client requested staff to work on secondment. To benefit fully from T T, it was believed that senior host country staff had to be back in their own environment where they could see the process being outworked amidst all the usual local encumbrances but middle and lower ranks of staff could be despatched usefully to the firm's UK offices. The latter enabled staff to obtain wider experience on larger projects and grapple with different uses of materials. There were CBI scholarships to be won for one year placements in Britain. One individual who had come to the firm through this means was now the deputy in a ministry in a West African country where the firm had work.

LONG TERM IMPLICATIONS

T T work had been conducted by the firm for some years with clients and was viewed as a long term approach to business. African clients were usually wary of relationships with one particular firm but T T helped to reduce this tendency. It added to the firm's reputation, was a useful marketing tool and could be profitable. Self sufficiency in many countries was not being achieved that easily because degree qualified nationals usually "aspired to politics more often than not". T T gave opportunities for access to client decision makers but since senior staff in ministries regularly moved on, it was necessary to offer further T T programmes again.

The firm usually needed an office in a country to obtain projects. Through T T projects it was possible to find out what future projects were going to take place. The firm had also created projects, put T T project ideas together and had gone to the ODA with their proposal but found to their dismay that they ended up with more competitors than they had started with.

In other parts, the firm had found T T a useful medium for entering new markets as instanced in China, Thailand and Malaysia. The projects, funded by the British aid sponsored T T scheme, linked to a British university, involved a computerised system of road maintenance. After introducing the system, they returned again to China and found the programme had been converted to Chinese characters and then rapidly passed on to other provinces, which had not been the original intention. However this first approach had brought other more substantial work in its wake and, without a system to offer, they would probably not have been able to enter the market.

The firm found it was easy to become stereotyped as a consultant in one of its disciplines in one country and yet be expert in quite another in a country alongside. Involvement in one African country had not led on easily to further business in another because of the rivalries and prejudices existing between neighbouring territories.

7.7 CASE 7

This case concerns a small firm of UK consulting engineers with considerable T T involvement abroad represented by projects in the Caribbean, Swaziland, Indonesia, Bangladesh and Thailand in highways and urban and rural development.

NATURE AND EXTENT OF T T

The majority of the firm's work overseas was in the area of projects, sponsored by loan and aid T T funding. T T was seen to involve the passing on of "organisational and management skills in engineering & planning and maintenance on both new and existing projects". The firm saw T T to be mandatory on projects but it had been a major part of their policy to offer T T and they had done so since the sixties. At that time there was a considerable amount of "western technology being dumped on the third world" and little provision for adequate maintenance of projects so the firm had resolved to enter this side of the overseas market, largely as a "professional feeling but also as a marketing ploy". The manner of budgeting was important for T T and in the firm's view a totally separate budget had to be set up to bring T T to fruition. Agencies could insist on too rigid systems of expenditure payment; sometimes the client found themselves struggling to keep up their agreed side of regular interim payments.

Many clients were keen to have T T but they frequently could not define what they wanted and it was often left to the consultant to clarify matters after a project had been obtained. There were a number of cultural factors linked to T T. Central Asians had plenty of "abilities in number crunching" but they had difficulties thinking more laterally. On some projects designs were being "lifted from textbooks" resulting in an obvious lack of fit with the local situation. There was a further cultural gap on projects because "engineers found it beneath them to involve themselves in the sharp end of construction" which exacerbated their own problems in overall project management.

Host country politicians often liked the idea of "technology" because it was synonymous with being in touch with the latest developments. However the firm was critical of Japanese and German aid agencies who were selling high-tech projects to poorer developing countries. This was instanced by high levels of construction technology being assembled in the building of a project, which left behind a system which could not be properly maintained. Japanese sponsors by pushing their own favoured brand of capital project, had taken up a

large slice some country's resources, available for maintenance. A multiplicity of other aid agencies often came to developing countries to "hawk projects to separate client ministries" of the host government. There was little or no coordination of this activity and the limited capability that did exist was usually severely overstretched as a result because T T tended to be funneled at the end of the day, through one (works) ministry to bring to effect.

The firm was involved in ODA projects in Central Asia producing realistic designs with local personnel so that they could be built by local contractors, using local materials, except for some steel, which came from Britain as part of the aid deal. They were working elsewhere in Asia on a UN rural development programme, maximising the use of labour intensive methods and seeking to strengthen village economies in order to reverse the flow into the cities. As part of this project, there was organisation of the manufacture of locally made tools. The firm has also passed on its experience in Africa of setting up local cooperatives. The principals of private sector local consulting firms from another part of Asia were receiving a very different kind of T T on the techniques of bidding for international aid projects. The firm was also active in bringing personnel to the UK for courses at universities and for T T work in their own offices.

TYPES OF PROJECT AND FIRM

It was self evident that the firm had usefully established enduring long term relationships with the client through T T, mainly through its maintenance project work. In the Caribbean they had worked on successive World Bank T T contracts in cooperation with the client since the early seventies, each time attracting aid funding to the country through the packages that they had put together there. Projects "which demonstrated a technical creativity" were viewed as the most likely to appeal to clients' aspirations for further advancement. The firm saw itself very much in the service related band of consulting offering "creative ideas for T T packages " which helped to keep their business flowing smoothly.

This enlightened approach extended to the way the firm had structured itself over the years in order to conduct T T work. Permanent staff remained essentially small in number as a deliberate policy with most of their management being trained from within. They recruited heavily for T T projects and relied on a network of a large number of contacts, three or four times the established size of the firm. T T as a process continued to be entirely profitable for the firm and the overseas T T operation was a separate profit centre. Teams of senior people were needed for each T T project and "each specialist had to be able to stand on his

own". This involved the principals of the firm in heavy inputs at the set up stage, when it was difficult to find the right key people; it was not unusual to interview twenty people to find the right person, who usually commanded a high salary. In the project area, the structure of the firm was essentially different to that in their conventional project fee earning work, which could support a traditional pyramidal organisation. "Hard" engineering projects by contrast involved layers of middle and junior personnel who could be charged to these projects, and the firm could thus always recover its overheads. Because of the skew of needed senior personnel in T T projects (from 30 years and upwards), the firm had to watch overheads more carefully and was not always able to recoup them from their permanent staff earnings. In spite of this, T T was usually conducted in the firm's mainstream areas of expertise. The firm considered that the larger consulting firms had more resources but medium sized and smaller firms could respond faster to a situation in which their partners were much more in touch.

COOPERATIVE ARRANGEMENTS

The firm had cooperated in a variety of arrangements, with other British consulting engineers and other nationality groups. They had joint ventured with Danes, Germans, Portuguese and Dutch firms. Three important stages were emphasised: "getting short-listed, winning a proposal and carrying out the work". Liaisons were seen as particularly useful in processing the first two of these. The firm always reckoned to work with a local consultant if available and they usually found them to be "more entrepreneurs than consultants". Often the technical side of these firms was "underdeveloped and too secondary". In undertaking a joint venture to carry out the work itself, the non-integrated arrangement was preferred. There was a cost to the lead firm if an integrated form was employed because different firms were used to "working with their own managerial and technological systems". The integrated version sounded "sensible in theory" but each party had to spend too much time "establishing common working approaches". The training offered under T T was just as satisfactory for local personnel as under the integrated arrangement; to them the "divides" within the joint venture were artificial and did not effect their ability to assimilate what was happening on the project.

Cooperation with British contractors had been scant. Considerable criticism was levelled at them for their poor prior research of markets, wrong attitudes to host countries, lack of creativity and short term approach to project work. Some of the firm's work involved evaluation of other firms' proposals on behalf of aid agencies. While impartiality was

required, the firm found that the British contractors themselves did not make their selection any easier as displayed by their apparent "inability to fill out forms correctly, even in English". As far as equity participation went, the firm had not become involved but they felt that their new "company structure might favour such moves" at a later date.

Subsidiary offices were not seen as necessary to obtain initial T T work but they could be useful in a country for obtaining a second or third project. National staff from local consulting firms usually accounted for two thirds to three quarters of the staff inputs on any of their projects. As a policy the firm usually preferred to work with "their own staff sited in client government offices" and here their official role was always advisory rather than executive. All the firm's partners were British and foreign nationals accounted for less than 10 % of the firm's permanent staff.

LONG TERM IMPLICATIONS

The firms saw T T as a long term opportunity, as evidenced by repeat orders in three separate regions of the world and they had cooperated with aid agencies for many years in seeking to build up local host country capability. The firm greatly valued their relationship with these agencies. Senior individuals in the World Bank and ODA had occupied positions as partners with the firm in the recent past. The ODA was seen as having many levels of bureaucracy, with which any firm had to deal, which added to the costs of working with them but there were advantages of assured payment and an informed judgement on contract extras and extensions when they arose.

T T was producing the desired results in some countries but it was happening slowly because it was possible only to assimilate and achieve self sufficiency at a pace in keeping with other aspects of the country's developing economy. T T had a "totally flat learning curve for several years" in many developing countries when modest amounts of aid money were needed. There was cause to argue with World Bank over their habit of funding one or two year projects sporadically. In Central Asian countries, local personnel were sometimes not motivated or properly rewarded to work on T T projects; to many of them it seemed like a process of temporary banishment away from any civil service promotion prospects. In other parts of Asia, T T was not working as well as it could because some government staff were moonlighting in their spare time, although, on the positive side, this usually led to the establishment of new private sector firms. In the Caribbean the local salary structure within government was poor which gave rise to a slow but steady exodus of trained staff to the

USA. However some recently completed maintenance projects there had achieved their objective, which enabled the firm to hand over viably systems to local management.

The firm was of the view that T T gave them an opportunity to access the client at the highest levels of management, where they could also gain an appreciation of the major problems facing the organisation. Once in the client's offices they could explain more easily the full range of what they had to offer. Sometimes they found themselves assessing other firms on the client's behalf, which cut them out of other project work for a while, unless they could land a sole appointment. A good T T proposal was seen as being highly influential in winning a project, especially those where there was considerable emphasis on the T T process. In Asia the firm had found opportunities to expand into neighbouring countries, because of the T T reputation they had built up there.

7.8 CASE 8

This case covers the subsidiary company of a larger UK consulting firm, which had been established as a separate operation with the intention of carrying out T T work. Projects of a small and medium sized nature in the sectors of roads and rural & agricultural development were located in Ghana, Nigeria, Madagascar, Somalia, Tanzania, Egypt, Pakistan, India and Sri Lanka.

NATURE AND EXTENT OF T T

The content of T T revolved around the know-how of the people who were assigned to the projects; the technology element was expressed in data bases on farming systems and cropping patterns etc. T T was seen as being almost mandatory on the development projects that the firm handled. The aid agencies who were most involved were the World Bank, AfDb, ADB, less so the EDF and the ODA very little at all. (Where UN sponsorship occurred, the organisation was viewed by the firm as favouring competitor firms from "second world countries" because their staff found it easier to deal with nationalities, who were similar to their own). It was hard to distinguish between the pressure coming from the aid agencies or the client. What was clear was that developing countries wanted the money that came through aid because it generated jobs in the host country, raised the living standards, enhanced infrastructure, improved farming methods & water supplies, which all contributed to crop and other exports.

The firm occasionally became involved in providing staff for World Bank appraisal missions and sometimes they contributed to the writing of the Appraisal Report, including that of Staff Appraisal. The firm found it useful to carry out this kind of work because they then became known to World Bank and were able to exert some influence. Usually however Bank staff liked to write these reports themselves in order to maintain greater control. Most other aid projects usually had a time lag until the first payment was made but from then on "they paid like clockwork" at monthly intervals. The parent firm had a holding interest in the subsidiary company and took a share of the profits, which were healthy.

The parent firm's own view was that T T had to be defined clearly between the firm and the client or it could lead to a costly process of carrying out extra T T work that was not priced in the firm's original offer. Inappropriateness had happened where a level of technology had been passed on to a country which they could not really sustain. Sometimes insufficient

crops produced low revenues to pay for the maintenance of equipment which had been purchased under a project. In spite of this, few countries would not be interested in acquiring new equipment. The whole process all contributed to "the circle of aid", which was leading in turn to the UK supplying goods and personnel paid out of the British aid budget. The USA was viewed as being "particularly keen to sell its own plant & equipment". The ODA was considered to be "achieving value for money in its projects", but there was a built in conflict with the approach of the BOTB. On one ILO project in East Africa, there was persuasion upon the government, through some personal intervention of agency staff, "to give away the heavy rolling equipment" which had lain idle for years to private sector. Within two weeks, parts had been obtained on the "black market" and the equipment was fully working for the project. This T T project was set up to encourage local contractors to tender for minor roadworks.

T T projects usually called for personnel with 20 years experience. There was a tendency for requests to come also for expatriate personnel with PhDs as well, since some of the senior people in host country ministries had used this qualification as a stepping stone to seniority. Where projects had a built-in requirement for some persons to receive overseas training in the UK, it invariably came to be seen as a "perk" or a "reward for good work" sometimes decided on the basis of the connections of the individual. It conferred on the recipient "cudos through the qualification gained, a chance to shop abroad and a measure of tax free status".

TYPES OF PROJECT AND FIRM

Agricultural projects rarely established more than passing relationships with the client because the projects were often in remote areas. A special visit had to be made to the capital city to activate contact with government decision makers. At home, a low overhead head office base in the UK was found to be a better way of impressing any visiting clients and aid agencies' representatives than a larger operation. In marketing their operation it was useful to play on the services of the wider parent group from which personnel could be obtained at short notice across a wide range of specialisms. A multidisciplinary package could be put together in-house and this was seen as a selling point, along with the group's track record in labour intensive appropriate technology projects. Personnel would be assigned by agreement from within the parent group. However the buoyant home market of domestic construction was making it increasingly difficult for individuals to be released for overseas T T work.

For the supervision of T T projects it was necessary to set up a strong team using senior persons "on the ground". Non-permanent staff were being used for this and directors of the subsidiary firm needed to visit projects regularly. There were thus some interesting effects on the firm's organisation of T T. The firm drew from a pool of temporary contract personnel, who were recruited for the occasion for anything from a few months to 2 or 3 years. The firm kept a data base of staff who had given prior indication of their interest in contract assignments with the firm. Regular faxes arrived of CVs of such persons, who were available for a tour of duty.

A small sized firm was thus serving its purpose well in organising a range of T T projects. In a nutshell what was necessary was to have a "database, a suitcase and a slick procurement procedure", the latter being needed to organise the accommodation and transport needs of expatriate personnel going abroad. This reliance on contract personnel was in those areas of experience, which were generally outside the firm's mainstream expertise in the parent group. One such project in North East Africa involved the provision of an agricultural project manager with "experience in water harvesting and soil & water conservation in arid zones". Persons who presented themselves for this kind of work usually had experience in other similar overseas locations and were well motivated. This was in contrast to many of the counterpart staff, who did not seek a transfer to remote locations because they felt they were "stepping off the promotion ladder". Coercion was often needed by their governments which affected their commitment and willingness to participate.

COOPERATIVE ARRANGEMENTS

The subsidiary did not need to use its own overseas offices or those of its parent; it tended to work through an overseas agent abroad with sound local knowledge of the country whose job it was to discover what work was available. The agent was paid a commission, once the firm had received payment itself. One such request from an agent in West Africa involved providing a mechanical manager to be responsible for an equipment operation. A link was also sought through the firm with a British contractor with whom a local host country contractor wished to cooperate.

The parent group of the firm had begun to realise they could help clients to spend their T T aid budgets by providing suitable courses in collaboration with Universities for 3 month periods in the UK or for longer master degree courses. Many projects were carefully defined

which allowed in their budgets for individuals to go abroad for T T. This could amount to US \$1 million in a US \$25 million project. Because of the time lag in arranging a participant's selection, expatriate T T personnel were often unable to hand over projects for effective operation to host country personnel because they had not returned in time to benefit from the stage of a project's implementation.

The firm felt that there were distinct advantages in providing T T for host country personnel in the UK because individuals expanded their horizons and automatically became more receptive to new ideas, which could often not be assimilated when they were confined within their own borders. In parts of North East Africa, "making changes" was tantamount to apportioning blame to the previous operator of the old method.

LONG TERM IMPLICATIONS

The firm saw long term benefit from T T but also felt they had to look constantly at their market which was continually changing. A measure of a threat was coming from second world personnel who were in a good position to provide third world countries with T T. However their "effective motivation and application" did not always make them strong contenders.

Self sufficiency was seen to be occurring to some extent in Central Asia but not much in Africa. Countries had to struggle against poor world market prices for their products and against a measure of their own incompetence. From existing T T projects, the firm was hearing about other projects and clients kept coming back to the firm. T T projects enabled the firm to access new markets that they did not have before. They were also able to branch off laterally into neighbouring territories in North East Africa from a reputation already gained in that region.

7.9 CASE 9

This case concerns a medium sized UK consulting firm with T T projects in Malawi, Botswana, Ghana, Malaysia and China in the sectors of dams, foundations and power engineering.

NATURE AND EXTENT OF T T

T T in consulting engineering was seen as management experience mixed with technical know-how. In Malaysia T T was mandatory but it is still optional in Malawi and Botswana, although the firm always offered it. "Clients usually expressed more interest in T T than aid agencies but in Africa most of their projects were aid funded anyway. The extent to which the client made their requirements clear depended on whether the firm dealing with a "general manager in administration or engineering". For either of these parties, they were always specific as to the number of people that they wanted to benefit from T T. In Malaysia 30% or 40% of the work had to be done locally which was counted as transfer. This led the firm, after an initial stage of the design, to send several personnel from the UK and to recruit directly in the country. The locals, mostly former graduates, gained in experience, some of which encompassed the letting of contracts to contractors etc.

The firm did not see any inappropriateness in their T T methods. In fact they had been working in many of the African countries for several decades even before their British operation was fully established. In sending out persons from the UK head office to the host country, they found they were restricted to staff who were 30 plus in age and who usually had to be professionally qualified with chartered engineering status. Host country personnel were regularly slotted into the firm's UK offices to obtain experience for periods of anything up to a year or more. Although there was some political bias as to who was sent, this arrangement worked well enough and those who came were put to work in a genuine productive capacity. Ghanaian and Chinese had benefitted from CBI and IAESTE scholarships in this way; the former arose from a Ghanaian professor contact of one of the partners but payment for T T still came from a T T external fund which the firm had identified. T T in this context was viewed as not being particularly profitable financially but the firm could usually "expect to break even".

TYPES OF PROJECT AND FIRM

Types of project most likely to lead to the deepest relationships with client were those in the creative category because there were "usually opportunities to impress the client, thereby attracting genuine appreciation for the service offered". One occasion involved solving a client's problem when water was being polluted by the disposal of waste. There were some repercussions, of a different sort, for the firm's organisation regarding the client's requirement in some countries for a local involvement. For one project in Malawi, certain aspects which could be feasibly done locally were completed there but with the backbone of the design being carried out in the UK first. The firm experienced some difficulty in being able to assign any of its younger expatriate personnel to projects abroad because the only positions were in senior and middle management. The acquisition of several projects in the UK was proving to be a crucial training opportunity for younger members of the firm's staff. The upsurge in the UK construction market was helping this situation and enabling the firm to carry out its policy of training from within the firm. The firm saw themselves as conducting T T in their mainstream areas of expertise. Beneficiaries of T T from host countries were more easily assimilated into a medium-sized firm and more likely to obtain genuine productive experience. Such a size of firm advantageously had a less structured organisation and was less departmentally divisionalised.

COOPERATIVE ARRANGEMENTS

In dam and irrigation projects the firm chose to go alone but where mechanical engineering inputs were needed they joint ventured with other UK consulting firms. In Asia they found it necessary to join together with local consulting firms and political influence was achieved as a result. It was noted that the latter reason was often so dominant that it "obscured other good reasons" for a joint venture. An arrangement which was fully integrated was favoured because it led to everyone cooperating closely together. This meant that the lead party had to take responsibility but the firm usually preferred to act in this capacity anyway. Sometimes parts of the work in a joint venture could be let out in a sectionalised fashion.

The firm was not contemplating any significant equity involvement in projects and if it did it would likely amount only to their "firm's staff time inputs". British contractors were noted to be absent in many locations abroad. Italian and German contractors both liked to work with British consulting firms because they had "greater strengths than their own design arms".

The firm saw it as being crucial to have an office with their own representation to obtain new work although in Indonesia they had contemplated an association with a local consulting firm. Workloads in consultancy tended to oscillate over the years between a "famine or a feast" situation. In Zimbabwe there was a very busy programme and more than half of the staff were local personnel. Less than 10 % of the firm's partners were foreign nationals. The firm saw distinct advantages in running a network of subsidiary offices servicing an international practice. Consulting engineering could draw upon modern fax facilities, achieve technical solutions to problems and make results known quickly throughout the group. They could plug rapidly into an active head office capability and were physically aware of people who they could summon from each of their intermediary subsidiary offices. Power engineering expertise, for instance, could easily be tapped in Canada.

LONG TERM IMPLICATIONS

The firm considered there was a long term future in T T; it was to their advantage to conduct T T with local staff in their subsidiary offices. They saw a "succession of offices getting bigger all under the same flag" of the firm. It was good for the firm but not necessarily so satisfactory "for Great Britain Ltd". T T was observed to be having a steady effect in leading to some self sufficiency in host countries. Those who came into the firm's offices benefitted; so did the firm in the extent of interaction it could build up with clients in order to hear about forthcoming work in the short term. Currently they were dealing with general managers in client organisations who had gained experience with the firm in the past. However T T was not regarded as a medium through which they could enter a new market but through their overall experience they found they could extend their influence from one neighbouring country to another.

7.10 CASE 10

This case covers a large medium sized UK consulting firm with projects in Dubai, Libya, Nigeria, Thailand, Indonesia and Hong Kong. The areas of work were in city planning development and architecture, the latter being the dominant expertise of the firm.

NATURE AND EXTENT OF T T

T T required by clients was that of "technical skills in handling large urban building projects". Technology itself a small part of this, comprised "computer software and desk top equipment for computer aided design" and other equipment using "laser surveying techniques". T T was not seen as being mandatory and was still optional for instance in Libya, where the client was the dominant party pushing for T T. Most of the aided projects arose only in Asia and the terms of reference of the contract usually "hinted at" a requirement for T T. Participation was required in Asia in what amounted to a "sleeping partner" arrangement, where the local firm did not really deliver in a productive sense. However in Libya, there was intense interest from local personnel.

There were occasions, in the Middle East, when the firm considered that one or two of its projects had been inappropriate to local needs. Industrial buildings of 3 or 4 storeys, for example, did not seem a good idea now in hindsight. The firm usually had to struggle to convince the client that "last year's model" was not always the best option for them and where electrical power supplies were temperamental they dissuaded them from using CAD. Asian clients asked for older senior expatriate staff to be involved in T T but they were not always prepared to pay for them; usually on T T aid projects there was a "straight cut-off point on fees" for such a provision. Younger persons in the firm were not able to obtain overseas experience as easily as they had done in the past. Sometimes an Asian client was more concerned to see a fast moving project completed on time rather than giving space to T T. This had led to local people being allocated to the project who were not very interested in benefiting much at all from T T; in one West African country they sometimes had not bothered to turn up. In Libya by contrast the client, being a public sector organisation, allowed its personnel to learn at a pace that they could assimilate and in this way considerable T T was achieved.

TYPES OF PROJECT AND FIRM

The depth of the relationship developed with the client was linked to the "scale of the project" which itself was "time related". The firm found that they were drawn into more T T than they really wanted in Nigeria at the end of an urban project when their role there became less and less viable. In Saudi the project had a high proportion of T T, related to housing planning with training for third world nationals; again the firm found it hard to relinquish their role at the end of the period.

Provided they could find the right senior staff, which was not always easy, the firm had adapted itself well enough to the process of T T. In their UK offices they were involved in overseeing MSc and PhD students whom they had placed at British Universities as part of the budget agreement of active projects. Experience was also gained by these postgraduates in the firm's offices during this time and it was the firm's overall policy to train most of their own staff likewise within the firm. Medium-sized firms were regarded as being able to give a personal touch to T T but larger firms would be able to afford the time and resources to carry it out. The success of T T was related strongly to the calibre of personnel involved.

COOPERATIVE ARRANGEMENTS

The firm were able to work alone in Hong Kong and Libya but joint ventured with local firms elsewhere. There was legislation to consider in Saudi Arabia and Indonesia. In Thailand success in winning a project was put down largely to the joint venture arrangement they had established with a local Thai firm. Although T T was not specified, it happened as a result of the two parties working together on the project.

The firm had sought to involve British contractors in their work in Libya but no British contractor had actually taken on contracts there since the early seventies, "mainly due to lack of ECGD cover". On a UNESCO project the firm had cooperated instead with Swedish contractors, with whom they had also sought to work when the Swedes established an office in the UK. British contractors were seen as being "too easily frustrated" and "too taken up with the enforcement of contract conditions" whereas the firm had found that a better understanding was created with the client by "putting the contract away in a drawer". The firm had worked with Italian contractors but found they usually preferred to work with their own nationality consultants. They had also received approaches from other nationality

contractors because of their knowledge of a country and their abilities in the English language. One such was a Yugoslavian contractor who had worked with the firm on a design & build project. However in spite of all these links, a preference was expressed for working with British contractors. The firm resisted any participation themselves in equity involvement due to insufficient capitalisation.

A need was expressed "for an office to win work" in the Middle East but their office policy in Asia was to obtain a project first. Even though they preferred to conduct T T in a client's office or in a project office with a local consultant, the firm still liked to have an office in reserve in order to handle other projects not pertaining to that particular client. In the firm's view T T was best conducted in host country territory because they could then deal with problems that the recipients of T T were most likely to encounter. All the firm's directors were British and less than 5 % of the permanent staff were foreign nationals, although in the firm's subsidiaries local staff accounted for a much higher percentage.

LONG TERM IMPLICATIONS

T T was seen in "humanitarian terms" and also as an "opportunity to make a good friend". Clients had been found to favour single relationships with individual firms time and again. Several clients had come to trust the firm, which was in sharp contrast to some other UK consultants who had left an "impression of wanting to make money" in a country ahead of any other objectives. The firm preferred to take the view that "they had been in business for 40 years and their policy was to take a pride in their work and do a good job". For this reason they did not view T T as a long term relationship in a cold and calculating sense.

The firm had taken T T assignments very seriously in North Africa and this had been fruitful for the client with competence built up among local staff who had continued to carry on the work that the firm had begun. When the firm saw "local personnel really trying to learn and being grateful for the help received" it evoked its own generous reciprocative response. T T had to be seen as an extended process which was unlikely to achieve overall national objectives because a country did not always have the reservoir of people to supply the capacity that were needed to develop to a full potential. The true process of T T in consulting was likely to take a minimum of 10 years but, in many cases, those who began to benefit soon found themselves as heads of organisations "without the structures beneath them" to really handle the project management and technical work. Generally the firm found T T profitable financially where it had been provided for in the contract. Recovery of costs

was possible on a "time charged basis", but the margins of profit were usually not as lucrative as the straight design process.

T T gave access to the client and it also gave a chance for the firm to explain the designs that the firm wished to implement. In some countries everything was done by committee; here the firm's staff could find themselves in the position of adjudicating their own designs. On technical assistance projects there generally were additional opportunities to hear about further work. In Asia the firm's relationship was mostly with the local firm and they did not interact so much with the client to the same extent as in other countries. Consequently they did not always hear about forthcoming work. In North Africa however the firm had established themselves so strongly through their previous T T projects that they had an open invitation to continue working although they had decided to withdraw from that area. The major reasons for this were that their professional indemnity insurance underwriter would not cover them for another contract extension in that part of the world. Most consulting firms apparently relied on insurance services from a small number of companies, many of them American. In addition, it was not the best place to be from a national diplomatic viewpoint and from the accompanying wives' perspective it had its limitations. To reopen an office and sustain large enough margins would also require a higher representation of the firm's staff than any of the upcoming contract extensions would allow. It was acknowledged that the firm had "almost become a victim of its own success". Although they had won an export award, the firm had found it necessary to retrench overseas in the last 2 or 3 years to re-establish their work at home.

7.11 CASE 11

This case covers a Canadian consulting firm which had grown by acquisition to become the largest in the World. Projects involving T T occurred in Tanzania, Nigeria, Malaysia, Bangladesh, Indonesia, Thailand and Singapore mostly in the sectors of power engineering and irrigation.

NATURE AND EXTENT OF T T

T T was seen as mostly engineering management and technical know-how but it also brought with it the latest techniques to a project usually through the introduction of world experts from the developed world. Hardware and equipment could also be involved; usually this also led to making available the human skills to apply them in the situation of the project. The firm had engaged in all kinds of T T including organising seminars in host country offices and in bringing personnel back to their Canadian offices for experience on their home projects.

T T was regarded as being mandatory throughout the world particularly in Malaysia, where in the early to mid eighties 15 to 20 % of the design fee had to be expended on employment of staff locally. The pressure to provide T T were seen to come from the host countries themselves who in the case of Malaysia had a development statement written into their national plan. The firm saw themselves therefore as helping ministries of government to spend their allocated budgets and to "help them show budget savings". In this context one expert had been brought in to convince the client that "more comprehensive mapping of its country could be achieved in remote regions by using a satellite sensor system". Aid agencies such as CIDA and ADB had made considerable funding available in various T T budgets which the firm had wide knowledge of and was adept at putting to use. The aid agencies were happy to see this funding expended and very satisfactory cooperation occurred on this front. These bodies were also seen as providing a thorough enough check on their own projects through regular visits of their aid advisers.

Clients were specific in their requirements for T T according to the position and level of education of the person in the client's organisation with whom the firm was dealing. Many countries in Africa "wanted the best but it had to be queried who was going to give this to them". Aid funding imposed limits, which richer countries could choose to ignore if they had sufficient internal sources to allow them to set the pace themselves in what they wanted

from T T. The firm's experience was that a reasonable case usually had to be made for every expatriate sent out to a project in a host country. When personnel were put forward for T T by the client, the firm was satisfied with the calibre of the individual. In many cases in the seventies, after a period of a year at Canadian head office, funded out of a Canadian aid fund, the individuals had returned home to take up positions as commercial directors and general managers in their own national power corporations; this was in Tanzania and Indonesia, where the firm continued to maintain active contact with them in later years.

T T needs were seen to be different according to the territory in which the firm was working. Key indicators were the country's economic strength, its stage of development, the extent of university education of senior personnel and their actual level of technical professionalism.

TYPE OF PROJECT AND FIRM

Complex projects were seen to be most likely to enable the firm to interface effectively with the client and establish deeper relationships. The firm regarded themselves as being in the multispecialist category of consulting with ability to act as problem solvers in the "strong idea" area. Acting at such a level in setting up advice and seminars on their mainstream expertise could be disruptive to their home operation if senior personnel, with departments to run, were removed for too long periods. Large mark-ups were therefore needed to recoup the costs of such individuals. T T was leading the firm to become more service orientated in its operation. One example of this was the increasing need to carry out a part of the design in the host country away from the head office location.

There were considerable benefits in being a large international firm with a network of offices, not least in being able to offer the client a full breadth of specialisms. The most efficient service was considered to be provided by larger firms who could "call upon expert personnel from within their own organisation" whenever and as soon as the need arose. Smaller or medium sized firms were less able to generate profits and had insufficient breadth to fall back on and therefore could not react adequately to a client's need. This would be reflected in a lower quality in the CVs of their staff. There could be some disadvantages in being a large size of firm, which the firm acknowledged in one bad experience they had had in T T within their own head office. A Canadian host country member of staff in supervising a seconded national had turned down a request for a personal loan without referring it to a higher level in the firm. This left a "bad taste" so much so that when the individual

concerned was in a principal position at home, the firm "failed to win projects in that country for years".

In a firm with such a wide network, there were annual gatherings for vice presidents from each of the continental regional areas. (The Vice President contributing had responsibility for Africa in the seventies and for South East Asia in the early eighties). The Canadian home parent was usually interested in finding out what potential each region could offer, what employment of Canadian staff could be secured for the group as a whole and how the group could best be promoted overall.

COOPERATIVE ARRANGEMENTS

In the early to mid eighties, it became expedient in Malaysia to enter into an association with a local partner so the firm appointed a Chairman who was a retired general manager of a local power corporation. Joint ventures began to appear in the mid eighties with a 50/50 share, the preferred ideal was 30/70 foreign:local. In the first year of the association, contact with the Chairman was regular; after that it became less frequent but the relationship continued to be useful for "sounding out local opinion on feasibility proposals, getting bills paid and gaining occasional access to the premier". In Nigeria, there had been a 50/50 joint venture relationship from the mid seventies onwards.

The firm also cooperated with other groups and had worked with a German contractor in Central Asia and elsewhere on German grant money. On the whole joint ventures were seen to limit the possibilities of T T because less cash resources were available to spend on T T as compared to aid projects. A joint venture often had to generate its own profits, from which it could pay for T T.

While there was little comment on the firm's equity participation, there was considerable facility on the firm's part in obtaining aid funding for T T, especially from the Canadian government direct. The latter was prepared to pay for the full cost of feasibility studies and also consider making soft loans available with repayments over 30 years at zero interest. Some host countries were more interested in receiving full grant aid, which they were being offered by other nations. Although there was little to choose between these two approaches, the firm found the Canadian government was not flexible enough to permit either option. The Russians were also observed to give free feasibility studies but they usually "came into the country and worked alone"; consequentially their studies invariably

"ended up gathering dust on the shelf of some government department" due to a lack of local participation. The best arrangement was to work with local influential people to attract attention and achieve success.

LONG TERM IMPLICATIONS

Considerable long term benefit had accrued to the firm through T T. They came to know national people as genuine friends, often having been "invited to their weddings" or "rented their houses". Through extended periods of contact in the firm's offices at home they were able to convince the T T recipients of the merits of the firm in a deep way. If the firm's principals wanted to call on these people at a later date, it was almost a matter of dropping in on them at their own convenience.

Host countries were gradually becoming more self sufficient. A significant influence in this process was the number of host country nationals who had obtained University degrees and participated, in the case of Malaysia, in UK international professional institutions. The process was still continuing, with academic assistance being provided for the building up of local universities with a full local capacity.

Through experience of electric power sharing between Canada and the USA, the firm had expertise in being able to advise on power station needs. This led to the arrangement of seminars, backed by the Canadian government, with invitations extended to all the Chiefs of Planning in Asia's power corporations and ministries to "present national governments with an idea for common power sources across their respective territories". The firm found itself in the unique position of bringing these separate national interests together, and being able to play on the political backdrop of unity that existed between them. This was one way that the firm was extending its influence to neighbouring countries in which it intended to win projects.

7.12 CASE 12

This case concerns a medium sized Singapore based company involved in "design & construct" and arrangement of finance for projects in Asia, Papua, South America, Dubai and Malaysia. The nature of their projects were marine jetties for mining companies, pipelines and general infrastructure; the main focus of the case is on two large "boot" projects involving T T in Malaysia in the water supply and electrical transmission sectors.

NATURE AND EXTENT OF T T

T T involved local personnel in the process of carrying out some of the design and also the construction of the works. Much stress was laid by the client on the involvement of at least 30 % of local personnel, in keeping with the country's policy. In fact the firm had achieved an 85 % involvement of local employment, which was a higher figure than had been achieved on ATP British aided projects elsewhere in the country.

Requirements for T T were not clear at the outset and as the company produced proposals, "the client added in extras". However after a while the firm came to see that it was a matter of paying a certain amount of lip service to the T T process. Those who were dealing with the firm at the highest level were not the persons who were directly benefiting from T T. Some of the client's enthusiasm went out of the process due to this evident gap between decision makers and recipients. There was also a moderately passive approach on the part of those assigned to the project when it came to learning aspects of construction. Those in senior management positions (slightly removed from the project) also felt that they had little to learn from the company's work.

There was no conflict between any aid agency and the firm because no agency funding was involved. As part of an established policy, the firm always withdrew from any project when it became aid sponsored because the number of competitors tended to rise and the margins to fall. The firm preferred to identify their own projects and sell an idea to the client. As a consultant, the firm was unusual in not offering a client a design. They only designed if they could construct, and this, if the firm could arrange a complete package with finance as well.

TYPES OF PROJECT AND FIRM

T T was seen as optional on projects that the firm tackled throughout the world, partly because the clients were mostly private sector and the projects did not always lend themselves to T T, due to the speed with which they were often delivered. Pipelines and jetties were not seen as occurring sufficiently frequently for the clients to want to insist upon T T. Projects with regular and sizeable demand were more likely to lead to an in-depth involvement with the client. The firm saw themselves as "strongly idea" orientated but not always "rapid deliverers" although they could achieve completion on jetty projects anywhere in the world in a matter of months, using the modular system they had developed. They also had a policy of local staff sourcing when possible because this kept their permanent organisation small; in fact, this amounted to no more than 100 "established" staff world-wide, although the total number employed was much greater than this.

T T was not seen to create any repercussions for the firm's organisations. They found they had to be careful to select the right personnel for projects when this involved supervision of so many local personnel but this was not really made on the primary grounds of their suitability as T T communicators although it clearly helped.

COOPERATIVE ARRANGEMENTS

The firm's policy was to act in the lead on projects. They had cooperated with an Australian consultant because of their strong local representation in Malaysia and at one stage had brought in an American consultant with a good name in water supply to impress the five financial institutions who had to be persuaded to put up the money. They hired a UK investment company with a reputation in privatisation deals to process the arrangement of finance which took 2 full years to assemble before project go-ahead. This funding mostly came from within the country; one source being the retirement fund of an oil company. In other countries, the firm was able to link up easily with many other nationality groups such as German contractors, most probably because they did not find themselves competing directly within their own domestic market.

The integrated joint venture was favoured as the most satisfactory for effecting a project in a T T situation. The lead party in a joint venture became responsible for all parts of the project with the other parties sharing the profits according to the agreed divide. In Asia it was common for a "consortia" type of approach to be used where, each party subcontracted to

carry out certain parts of the work within the overall project. The "consortia management board" was not as powerful as the "joint venture" board and conflict of interests could arise early on with partners putting in too high a price initially for their share, expecting the others to bid them down. Under the consortia arrangement there was not the same commitment to the overall objectives of the project. It was noted that each of the subcontracting parties was also one step removed from the client.

In the privatisation projects in Malaysia, there was an integrated joint venture with the local firm taking a 30 % share. As leader of the joint venture, the firm was in a position to organise the overall work so that they could handle the high profit items themselves, leaving the local firm to carry out the more straightforward pieces of work at more competitive rates. It was a large prestigious project and the government was pleased that their mandatory T T guidelines were being applied.

On a wider front, the firm found it essential to have some dozen offices around the world to obtain projects. One third of their head office personnel were occupied with full-time marketing. The firm did not undertake many projects in any one year; in fact in the last 4 years they had limited themselves to ten projects only but each of these was in the £7 million to £200 million bracket. While annual turnover went "up and down", profits remained "steady and buoyant". This aside, the firm was experiencing some difficulty in moving money out of some of the countries where they worked (including Iran and Malaysia) so they had to resort to "buying something externally" from a project's profits there.

T T was considered to be carried out best in the project location, which fitted in with the firm's policy of keeping a core of essential permanent staff and using local staffing on projects where possible, even though this "could add to costs" due to the inefficiencies that occurred by the project taking longer to complete. Host country staff who were taken abroad for T T had to be "alert individuals who could stand the culture shock" and who could "apply themselves properly" in the limited periods offered.

Singapore had been chosen as the head office base by its founding directors, who were mostly expatriates from UK or USA except for 10 % of them who were nationals. The reasons for this location were that communications there were ideal. Flights could be easily arranged to South America or Australia. Labour was reasonably cheap for the firm's manufactured structural steel component jetty system. There were "no strikes" and the "work ethic was excellent". It was also possible to take on Malaysians at competitive rates to

"work in the head office on accounting and engineering functions". Coupled with the fact that South East Asia was regarded as a growth area, all this made Singapore an attractive centre for the firm.

LONG TERM IMPLICATIONS

T T was not in any way seen to be a long term relationship with the client. The firm became involved in T T "only because they had to do so" in response to client pressures. They were also sceptical that T T made much difference or had any lasting impact partly because "those making the most fuss over T T were not around to see it implemented" throughout the project period. T T was not seen as a great earner but the firm might expect to "cover its costs or even lose on it". Little information on upcoming projects was derived during the T T project itself and T T would not be used to enter a market. Arrangement of finance, sharing in equity and "boot" involvement were more potent means for clinching projects with clients.

7.13 CASE 13

This case relates to aspects of T T from the perspective of four different individual UK consultants who had been employed in an executive or advisory capacity within host country client organisations in the countries of Malaysia, Papua, Belize and Nepal with accompanying experience from Thailand, Bangladesh, Sudan, Falklands and USSR. The disciplines of work covered roads, railways, bridges, buildings and marine works.

NATURE AND EXTENT OF T T

T T was regarded as an exchange of know-how on the coordination and management of projects and the coordination of infrastructure development. Equipment and material technology was being transferred, which had been developed in other locations: examples being piling systems on bridges, waterproof membranes on buildings etc. T T was almost mandatory in South East and Central Asia but less so in Central America. The World Bank and ADB often wrote it into their proposal documents. T T was "certainly in vogue" and most consultants had seen that T T was working and knew they "had to have a meaningful T T proposal to be considered seriously by the client". Such clients were not always clear in their requirements; sometimes they "wondered why they needed expatriates to help them run projects when they had sent people away on University courses".

Host countries recognised that donor countries who contributed to aid agencies wanted T T and they went along with this. In one Asian country, Japan had some "80 or 90 supernumerary technical advisers in the works ministries", who had all been sent free of charge. Some host country staff, however, felt that "they had not requested the product" and this led to much underutilisation. Part of the explanation was "conscience money" for adverse balance of payments but they were also known to be "scouting out the market". There was also criticism of an ATP project in Asia, which the British government had latched onto without the fullest of detailed briefs. The grounds of ATP appraisal were viewed as being much less rigorous than aid projects; the major aspect being that "there was foreign competition" and only one British entry.

Large project packages were not seen as the answer for developing the potential of host country staff, although large dams and docks usually needed to be carried out as one-off projects. It had to be accepted that many developing country personnel were most familiar with a system which moved at a different pace. Sometimes projects were designated as two

year projects for no apparent reason, when a longer period would be more likely to achieve the aim of T T with just the same expenditure. Central Asian countries with enormous populations were often unimpressed by plant-intensive methods as used for instance in concrete-trains on highway projects; the reason being that the cheaper cost of labour in plentiful supply made such methods inappropriate.

Usually budgeting of projects allowed for 10 % add-on for T T; over and above that provided for the project. Some countries were criticised for not being prepared to pay the costs of T T at lower operational levels, which perpetuated a "death of experience at the site end of construction". Masters degree courses were often seen by client managements as "cheaper and more prestigious options". Sometimes short courses were also used as a pre-retirement perk for senior government officials. In other countries it was the norm to travel abroad at regular intervals for short visits throughout a senior manager's career.

Care had to be taken in insisting on proper expenditure of aid money for the purpose to which it was allocated. Too easily the money could become syphoned off "without anything concrete being achieved". In remote locations it was difficult to recruit well suited expatriate staff; some people could spend half their time "just trying to survive at a standard of living that they considered as essential". Russians tended to keep to themselves; mainland Chinese integrated well in contrast to the Swiss who "adjusted with difficulty". One Canadian aided project worked well in Nepal, with a very low number of expatriate staff.

TYPES OF PROJECT AND FIRM

Projects which generated the deepest relationships between the parties involved in T T were those which "encompassed an on-going commitment", such as "road maintenance" or "specifically structured T T projects" which enabled information to be exchanged as part of a prearranged plan. "Routine" projects were seen as giving opportunity for understanding what was going on but they could also lead to the parties becoming more remote from each other. "Complex creative" projects were more likely to catch the imagination and retain the extended interest of the client for a longer period.

T T did influence the head office organisations of some incoming consulting firms. Frequent trips were often made abroad, which meant that other senior personnel had to be available in the firm to fill the gaps they had left. Some organisations participated in transferring "intermediate technology" to the poor end of developing countries. They knew this

business and performed it adequately, although it was not seen as part of any main sector of expertise.

One or two firms were referred to as having set up training units for conducting T T round the World. Those who performed this service best were those who had "set themselves up from an overseas base". A number of smaller firms had also become committed to the less developed countries. They had their own advisers in client ministries and knew that "their national budgets could not stand that much" but they had segmented a market which "went on year after year". These clients were also helped on a "day-to-day basis rather than project by project".

COOPERATIVE ARRANGEMENTS

Joint ventures with local consulting firms were becoming more numerous in Asia and they were also taking place in such parts as Botswana and Ghana. In Central America a one-off project for a large port was carried out by an American design & construct company. This was seen as a lost opportunity for T T to host country personnel because of the rapidity with which the port was built. In Malaysia, one British consultant had worked in the lead in association with a local firm but these roles were reversed on the next project. Advantages of the joint venture were described as "access to local resources in accounting and procurement". On some T T projects, British firms took on board personnel who then transferred to their head office as permanent staff. Their multilingual abilities and experience of operating in a developing situation as nationals were seen as advantageous to the firm in future projects elsewhere. Joint ventures usually needed to be fully integrated to have the most chance of success. For T T to occur this also meant the "project had to be overstaffed".

A consulting firm needed a local office in the host country because they would then "become known and be seen around". A local association could act as the equivalent in some Asian countries. In terms of obtaining new business, the influence of one well-known committed individual who was resident in a region could not be over-estimated. The label of an office had to be backed up by an active and visible presence.

LONG TERM IMPLICATIONS

Consultants were reckoned to be involving themselves in T T because it was demanded of them, although relationships were strengthened and reputations enhanced, if it was done well. One consulting firm had been in danger of being "cast in the mould of low technology" by the World Bank, because of the reputation they had built up in labour intensive road projects, whereas this was only one part of their overseas portfolio.

Self sufficiency was occurring gradually in most countries. Modest advances had been made in India and Bangladesh; even more were being made in Thailand and Malaysia, and less in countries like Ghana. T T did not have a reputation for being a high earner for consulting firms but it could be profitable. There were notable successes in T T projects; one instance was an infrastructure project where ten expatriates and two visiting academics from a UK university were working with 150 local staff. On a later stage of the project, the same host country personnel were implementing what they had gleaned earlier, mainly because there had been emphasis in ensuring a follow-on of this sort. Self sufficiency was being hindered by a fast birth rate in some regions and "excessive graft and corruption" in others. The latter made aid agencies understandably more cautious in the way they set up and approved projects.

T T was giving consulting firms more of a chance to "knock on client's doors for future work". Clients could also judge better the current contribution being made by these firms. In Papua, they needed to be willing to work on smaller projects before larger projects would be released to them. A good reputation with a client did not necessarily ensure that the aid agency would see them in the same light on the next project. In Nepal one firm "produced a good project for the client but fell out of favour with the agency". Laying stress on the "use of counterpart staff throughout the period of the project" was a point worth noting in preparing proposals when contemplating T T work in new markets. Some countries were best not entered from a neighbouring territory: Kenya was not a viable base to enter Uganda for reasons of interivalry. However "airline communication links" usually determined which countries would be most attractive to consulting firms contemplating expansion.

7.14 CASE 14

This case is specifically related to T T aid projects sponsored by the Overseas Development Administration (ODA) and the World Bank. It encompassed interviews with chief advisers and engineering advisers in these agencies. Countries providing a project T T background were Mexico, Zaire, Mali, Sudan, Nepal, Pakistan and Indonesia in the sectors of irrigation, power, roads and railways.

NATURE AND EXTENT OF T T

The largest gaps in developing country capabilities were seen in the area of management. Often individuals themselves were well qualified and trained but the organisations in which they sought to work were chaotic. Project aid could sometimes be "a small drop in a large pool" and for this reason the agencies from the mid eighties onwards had increasingly sought to emphasise "institutional strengthening". Attacking this process was like "peeling back an orange", other areas kept appearing which needed attention. A part of this process was to strengthen the local construction sector in host countries including contractors and suppliers. A maintenance element of ongoing capability was also needed. Many African countries had come to be in a position of debt where they were obliged "to go cap in hand to the IMF".

The ODA saw themselves as providing greater pressure for T T than the client country, and it had been a requirement on their aid projects for some time. Certain clients such as Indonesia were very specific in their requests. India positioned themselves as "being less in need" and China had "wanted everything available". A large variety of T T approaches across the full spectrum were backed by the ODA. Counterpart staff learnt in their own environments to deal with the problems they found there. Alternatively staff could also be trained in "modern and efficient UK consultants' offices". For a water project, by way of example "software and ground water development and modelling" might be learnt in the UK with the data collection being carried out in the host country first. The agency favoured a team approach to T T in client offices. This circumvented the problem of isolation felt by individuals when they returned home. Personnel were also sent abroad for short courses of 3 months which were mixed with some practical experience. In addition personnel came to the UK for longer courses through the British Council. Usually those assigned for training in client government public sector organisations were released only when they had been "confirmed in their post"; they also had to "wait their turn", as well as being "officially

nominated by the organisation". The agency liked to identify people who were going to "end up running the organisation" and take them onto T T arrangements early in their careers.

The World Bank operated its project system in conjunction with the lending quota which had been allocated to a country. Within a project allocation there was invariably a T T technical assistance element. This made provision for consultants to be engaged for 2 or 3 years, often separately from the design process. The World Bank usually sought to persuade the client as to the value of T T although in some countries clients "could be fairly resistant to the process". Where T T was inappropriately carried out, it was either because of a lack of interest on the part of the host government and of the client's staff or because some high-tech countries' staff "found difficulty adjusting to sub-Saharan Africa" for instance. In Indonesia, at one stage, projects had been overstaffed by Bank people who, at that time, lacked the appropriate skills to work locally. From the client's side their own senior staff "resented being told what to do".

TYPE OF AGENCY AND PROJECT

Over the years monitoring of projects by agencies had increased, which "almost amounted to management of them". The ODA had become in essence a special kind of banker; 90 % of their aid was grant aid, which altered the perception of the recipient. If it was a loan project, clients tended to ignore any guidance from the agency "because they were paying for it". The grant system afforded greater practical control. Usually the ODA did not pull out of a project but the recipients might. There was a sunk cost problem here with cash having already been invested. If failure occurred, there would be nothing to show for the investment.

Those projects which related to agriculture, education and highway maintenance were seen as more likely to promote a consultant's close relationship with the client, because these were often based on "fundamental inputs". The Bank usually sought firms who could offer technical assistance in their proven area of expertise. Sometimes financial management consultants were brought in for, say, the "financial side of the railway business" although technical consultants did this also as part of their work.

Medium sized firms were not especially favoured by the World Bank because they considered they did not always have the staff with the long term experience. Such firms

would be likely to recruit staff for the occasion or they would marry up with a firm who did have the skills in-house. In this context, an example was given of one medium sized firm who proved successful in Africa by joining up with a state-owned consultancy wing of a home national enterprise.

COOPERATIVE ARRANGEMENTS

In an ideal world, most consulting firms probably wanted to work overseas "alone" but there were strong pressures to joint venture with local firms particularly in India, Pakistan, Malaysia, Indonesia, Iraq, Iran, Kenya and Mexico. It paid some of them to "hide behind some political association" to widen their influence and also to keep the costs of proposal bidding down. The technical competence and professional reputation of the local parties were also of considerable importance; the quality of local personnel was particularly sound in Indonesia and Thailand. Local partners could provide assistance on conditions of employment, or on entry to host government departments and on prices of equipment and services. Even if these associations led to local firms taking over more routine work, UK consultants could still market their specialist services and their "professionalism". Local firms gained a certain respectability through these liaisons, which gave "assurances of a lack of corruption".

British contractors were not so globally evident as consultants; the latter were viewed as having a "good feel for what was happening in the world at large". There were numerous cases of British consultants saying that British contractors were not interested in working on their projects. UK consulting firms "independence and forthrightness" were an asset and this contrasted with German consultants who were more the creatures of "construction arms of their own industry".

There were a number of comments made from a World Bank perspective on the different national characteristics of consulting firms, mainly in the railway sector. German firms were very sound technically but sometimes lacked adaptability. French firms had a great capability to draw on staff from their national domestic organisations, although they tended to be rigid in their ideas and in their working to French standards. Indians had a wealth of experience from the large domestic market; they could quickly produce a range of experienced staff with knowledge of both sophisticated and unsophisticated systems and, provided their liaisons with other nationalities were satisfactory, they adapted well to third world situations. Canadians and Americans both worked to very high standards technically.

Joint ventures usually had a restricting effect on the T T process. Those which worked best in a T T context (by involving more local people) were those which were fully integrated. The quality of the transfer would suffer if there was not a fully integrated approach although it had to be made clear where responsibilities lay for parts of this work.

For consulting firms to have an established office in a location certainly helped them to land a project with a client but it was not essential. If demand was strong in a region it might lead a firm to set up a regional office. The ODA usually evaluated a firm on its local or regional experience, its track record in the project sector domestically or elsewhere, its project manager and the CVs of the personnel to be assigned to the project. In World Bank sponsored projects, it was emphasised that the head of a project mission had to be named and guaranteed for full time availability; this was regarded as vital to a consulting firm's selection. It was not necessary to have an established office in the country to conduct T T; this could be done in the project office or the offices of the client just as effectively.

Usually T T was seen as being more effective if it was carried out within the host country rather than in the UK. It was noted that consulting firms adopted different approaches in the way they ran their international networks. Some firms appointed nationals as regional partners but in most UK international firms the majority of partners were British, although up to a fifth of the staff in UK offices could be foreign nationals in UK offices. Where firms formed an association with a local firm this often reduced the numbers of foreign nationals that the firm employed directly.

LONG TERM IMPLICATIONS

Clients usually favoured single relationships with individual firms and they laid much store by personal relationships. Host country clients often requested a particular consultant, time and again on ODA projects. In such instances, the agency had to satisfy themselves from several sources that this was not due to "back-handers" and was "for the right reasons". Many consulting firms were in receipt of T T secondments to their offices. When host country personnel came to UK offices on ODA placements, it was not intended as a cost to the firm.

From the World Bank's viewpoint, "attitude was all important". A change of government had changed things for the better through the years in countries such as Mali and Bolivia. However in Sudan and Argentina for several years up until the mid-eighties, T T was not

seen to be achieving its objectives; in fact Argentina had gone backwards in two decades in some sectors.

Self sufficiency was seen to be occurring through a number of ODA aid projects. Ministries had been strengthened through specifically tailored projects. One example was Indonesia where designs had been done locally leading to the establishment of viable design units. Promotion "out of a post" was a constant problem in many public sector departments which meant that T T was continually needed. The recipients were still likely to be attuned however to the right wavelength when they moved on. Sometimes personnel disappeared to their own firms in the private sector or, less advantageously for host countries, they exported themselves to the World bank, USA or Middle East. The general view was that the gap was reducing and developing countries were beginning to manage projects just as well as firms from developed countries. However the nature of the business was changing and any threat to UK consultants was diminished accordingly.

From the World Bank perspective, consultants generally saw T T projects as a long term involvement. The World Bank encouraged this and hoped that governments or other agencies would fund consultants to continue working on projects for the same clients so that advice could continuously be made available. It was clear that T T projects formed a useful introduction for consultants to work with clients who were new to them.

Normally the initial need was for a "project" but the objectives for any project could also contain a dominant training element. The ODA was often surprised at the number of consulting firms who showed interest in their work. Consultants certainly valued aid assignments because it gave them a "foot in the door" in a new location and also offered them good contacts. Projects could be also "created" by consultants themselves; they were free to visit a client and write the draft terms of reference for an aid proposal. This was risk capital on their part but it was welcomed by the agency because the proposal was usually thoroughly presented as well as being derived from informed sources.

7.15 CASE 15

This case concerns three of the largest British contractors working on T T projects in a variety of countries in Tanzania, Zambia, Kenya, India, Sri Lanka, Singapore, Indonesia, Hong Kong, Egypt, Saudi Arabia and North Yemen. The sectors represented were railways, factories, mining, roads, tunnels, power station, urban development and airports.

NATURE AND EXTENT OF T T

T T was understood to mean the ability to manage projects; interpret contract conditions; handle a large construction organisation and apply experience. Technology would be included in this know-how, some examples being "laser surveying" and "slurry techniques" developed in tunneling. It was usually a mandatory requirement on projects particularly in Asia and clients themselves were observed to show the most interest in T T. On occasions, firms could find themselves called in at a half-way stage when developing countries personnel had begun a project and discovered they lacked the know-how to continue, or found they could not turn their own country's methods round from what they had learnt themselves in the developed world.

In Central Asian countries firms sometimes experienced difficulties over the "interpretation of the critical knowledge required" of those persons offered by the host country client; from the client's view, qualifications were usually the measure rather than experience. When the firm began work on the project, they had to plan for a "central body of staff" to run the job with some additional local back-up. Projects were more likely to be appropriate to the countries' needs if an aid agency was involved. Examples of inappropriateness were "machine intensive methods on African roads" and "skyscraper buildings in African cities". One firm found themselves brought in quickly by a Canadian contractor on a mining project in Zambia with a £3 million T T element out of £18 million, because their Canadian partner had "failed to demonstrate sufficient communication" in carrying out the T T side of the project. Firms working in Egypt found that they had to make a case for each expatriate brought onto the project even though the funding came from British sources. In Saudi Arabia there was a very free and easy attitude to T T on the part of those assigned to the project. T T itself was seen as being related to the economic prosperity of the country and was most needed in Africa.

TYPES OF PROJECT AND FIRM

T T did afford a little more opportunity to interact with the client although a contractor, if not the lead party, was in the position of being one stage removed from the client due to the contract system, unlike the consultant. However, those T T projects which were likely to be frequently ordered "such as property developments and buildings" were reckoned to provide the most chances of continuing relationships. Tunnels were usually one-offs in this context.

Most firms paid only passing attention to T T because in productive terms, it usually did not dominate a project but on T T projects there had to be a slight change of emphasis in their recruitment for the project. Some companies were observed to have set up in training in the UK which they were then trying to export but none of the firms saw themselves in that category. Medium sized firms might possibly respond a little more quickly than a large firm when an opportunity was identified but they were far more vulnerable if things went wrong.

British consultants were observed to be more spread out round the world than British contractors because their overheads were lower and they could operate for some of the time "at an end of a fax machine". International consultants knew their business and expected to work to keep their presence alive in varied locations. Because of their company structure, contractors had to be more concerned with shareholders' profits. If a share quotation oscillated too much, it affected the length of time a contractor would stay in the country without work.

COOPERATIVE ARRANGEMENTS

Firms usually chose to operate "alone", when they had been well established in a country for some years but if they were "breaking new ground" a local partner was preferred. Most of the large contractors had used just about every combination of cooperative arrangement at one time or another. British manufacturers invariably sought a joint venture with a contractor because the latter was more likely to have a local base. In Kenya this applied to one project where "gunboats were part of a deal".

On joint ventures the fully integrated variety was preferred because the venture could exercise more authority and this cut down on inter-rivalry between each of the contractor firms involved. On the other hand if each company kept their identity within the joint venture

they knew they had a reputation to preserve which extended beyond the life of the venture. These firms were also in a better position to link back into their home organisations for back-up resources if needed.

Offices were set up in countries to obtain projects or re-opened in response to increased demand. ("Palm-greasing" always had to be considered). One firm had kept a nominal office in Jordan for 20 years with little coming of it. Where demand was slack in a region it was useful to work between 3 or 4 countries to even out peaks and troughs of workload. Usually share price pressures curtailed speculative offices after 2 years without project business.

T T was usually carried out on a project rather than in a subsidiary office. Some firms had non-executive directors who were host country nationals but the executive board was almost always expatriate. The proportion of local staff on a project would usually be 70 %. On some types of work "such as cable-laying on utilities projects" this proportion would be higher. In Saudi Arabia a large number of third world nationals were employed.

LONG TERM IMPLICATIONS

T T was related to the amount of money available on a project. If funds were limited it could suffer. It also came second to the requirement in a project to provide finance or take a share in equity. On balance, contractor firms did not see T T as being in their long term interests or as being profitable. The exception were a minority who countenanced a long stay in a country and who were tapping into aid funded sources. Nonetheless for all firms, T T was regarded as adding to their firm's reputation in a given region.

There was some scepticism expressed over the idea of self sufficiency. Continuity was easily disrupted and changes of governments could often oust those in senior posts who had been past recipients of T T. In Central Asian countries competent individuals often moved on to the Middle East, sometimes joining French or German contractors. Through undertaking T T in a country a firm could at times recruit some useful staff to work on projects elsewhere in the world.

T T projects did not necessarily allow a firm any great chance of hearing about future T T projects. This usually came about through the firm's own marketing effort through a local office or through visiting prospective clients. Information on T T projects were also picked up by other divisions of the firm as they went about their normal business.

There were some examples of T T projects being linked usefully to new business. EEC money was earmarked for certain sector developments and where T T was offered in a proposal, it could influence the outcome. In Tanzania, one firm had assisted the government in putting a bid together for an EEC funded T T project and managed to angle the proposal in their own direction so that they beat off any extraneous competition when bids were evaluated. Another firm was finding the T T package in its power sector a useful selling point for approaching new clients.

7.16 CASE 16

This case provides representation of equipment suppliers, capital goods manufacturers, turnkey and process contractors. T T project work was in Zambia, Botswana, Zimbabwe, Turkey, Portugal and China in the sectors of mining, factories, process & plant manufacture and power stations.

NATURE AND EXTENT OF T T

In mining, as an example, "not much new ground" was broken in T T related projects. If methods had been tried and tested for 20 years they tended to be used. What was transferred was mostly management and technical know-how. Sometimes complex technological equipment was imported to a project, which could lead to the "mineral ore quickly doubling its yield". "On-stream analysis of ore samples" was also introduced which replaced raw human skills with control equipment. T T was conducted both on the project and also in the firm's offices; courses were also laid on for overseas personnel to attend at equipment suppliers' plant headquarters in the UK.

The pressures to undertake T T were seen to come from financial sponsors and aid agencies, such as the World Bank and the EEC but also the "needs of industry" were driving it too. Some equipment in Africa dated from the 1920's and 30's and needed modernisation. The labour force was often unsophisticated and being replaced with much needed advanced technology. Clients sometimes did not know what they wanted in T T or alternatively they could be quite specific in stating which people they wanted trained and in which areas. An example of this was for personnel to be instructed in the transmission side of mine loaders. Another example of the introduction of technology was machinery to cut black marble thereby keeping the "value added" in the country prior to exporting.

Inappropriateness also occurred: plant with very advanced technology and considerable computerisation was introduced into some unpopulated parts of Africa but no one was able to rectify faults; the differences prevailing between Europe and Africa had not been fully appreciated. Hence the need came about for short courses with suppliers in the UK, which were often linked to training packages, commonly required with new equipment. The situation was not helped by some Eastern bloc countries offloading equipment onto third world countries that could not be sold elsewhere.

Parts of Africa which had once had efficient operations had been allowed to run down in the seventies, often due to lack of attention in critical areas of equipment maintenance. For instance "winding mechanisms on a mine had always been kept in working order as a priority for moving ores to the surface" but even these had fallen into disrepair. With a situation of so much outdated machinery and a falling price for the mined product, the World Bank had put pressure on local industries to become more competitive. Many manufacturers were brought in but the host country ended up buying equipment that they did not really want. The T T element in supplier projects tended to be part of an equipment package but most clients in poorer developing countries balked at the idea of paying for T T. They were far more interested in spending directly on equipment, and that as cheaply as possible.

TYPES OF PROJECT AND FIRM

Complex products were considered to be the most likely to be a vehicle for establishing a deep relationship with clients. This was partly because the client had to have considerable inputs of technical know-how to operate new sophisticated equipment. Where workforces in host countries were unspecialised, many supplier companies needed to take training seriously in order to stay in business. Overall they were being driven to a "greater service" orientation, and with a shortage of foreign exchange they had to develop rehabilitation and buy-back agreements. Training had to be handled carefully at an individual level in some parts of Africa: if it led to a man being put out of work later because of incompetence, he would be "unlikely to get another job". Usually however it led to a more satisfied client and left a good impression.

Some firms in the UK were known to be entering T T as a separate part of their business by tapping into sources, which had funds specially available for this purpose but the majority carried out T T only in their mainstream product business. More of a separate market was seen in marketing T T in management skills. Technology related T T usually had to be mixed with the product, however, and could not survive alone.

Medium sized firms were likely to provide a less satisfactory T T service because they had "difficulty spreading themselves". Large firms could access specialities in their daughter companies and had a larger pool of staff to draw upon for T T work overseas although policies needed to be worked out that adequately rewarded staff service overseas, even in large firms.

COOPERATIVE ARRANGEMENTS

The turnkey and larger process firms had entered into joint ventures with local contractors and client organisations in Turkey and Portugal. The former involved putting a utilities supply into a large city with know-how being passed on to local staff in the UK and in the host country. They also had a large minority stake in a Zimbabwe company. However if the firm wanted to enter a market in Europe or Australia, they would more commonly "buy a local company". National companies in Europe were conducting their business better than the parent company could achieve by using some other form of cooperative arrangement. The turnkey manufacturer had seen more and more of their power station operation moving overseas which had an adverse effect on the level of employment at home. In China some materials were being made locally and training of local people had been in progress in response to the client's requests. In other places such as South Africa, there was a very sophisticated operation which had become totally independent. In Zambia a manufacturing firm had entered into a joint venture for a motor vehicle plant, where bodies were made locally from castings. Some valuable gains in import substitution had been made for the country by importing manufacturing technology and achieving local assembly of certain parts of the operation. Technology for a smelter had also been brought from Chile "under license". This meant personnel secondments to Chile with subsequent modifications on existing local furnaces, along Chilean lines.

In the supplier field, equipment firms were working through a local agent but when sales reached a certain level, a full local agency was set up to maximise sales and provide an on-the-spot reliable after sales service, run largely by local staff who had already been in receipt of T T. Equity participation was part of the business being developed by the process firm, although African clients seemed to be more interested in long term loans. This was partly because of their "experiences with the Tanzam railway" and also because it harped back to pre-independence days.

Subsidiary offices were of little consequence for mining supply firms because a very few firms had dominance of the market in their own separate continental stamping grounds. Mining firms tended to work with a proportion of one in ten expatriates to local staff. Other supplier firms were fully staffed by local people except for 2 or 3 senior departmental managers and the process firms also had a policy, partly for cost reasons, of establishing a local operation with full local competence which involved several programmes of technology transfer.

LONG TERM IMPLICATIONS

In spite of acknowledgement that T T was "obligatory in the world because competitor firms were doing it", the turnkey firm had found that their policy of employing one third of their graduates from overseas countries upon graduation in the UK in the sixties and seventies was even now still bearing some fruit. When they went to investigate the possibility of upcoming power station work around the world, they invariably encountered many of their earlier staff who were now in senior positions.

In sections of Africa self determination was described as being "a long way off". Part of the problem was that the industrial base of the poorer countries was underdeveloped. The local market was too small and the export market was too competitive, often due to prohibitive transport costs.

The process firms were not really interested in short term stays. They saw the way ahead as a long term involvement in a country which inevitably meant transferring know-how to local people. It was anticipated that a good rapport would be established which would generate on-going links. Funds available in the EEC and World Bank were being used to put packages together for the client which the client would not otherwise have achieved. This further added to the reputation of the firm in that "something beneficial was being ploughed back into the country" by showing a local capability of direct use to the development of the area.

CHAPTER 8

SURVEY RESULTS AND DISCUSSION OF HYPOTHESES

8.0 SUMMARY OF CHAPTER 8

1. The coverage of the projects involving T T was mainly in Africa and Asia. Most sector disciplines were represented, including roads and bridges. The majority location for T T was in client, home and project offices. World Bank and ODA funding was much in evidence. Projects ranged in value up to £700 million and most had occurred in the last 3 years.
2. Technology transfer was found to be more management know-how than technology related. It was not seen as being mandatory except amongst contractors and it was not encouraged any more by aid agencies than by host governments. Generally clients were sufficiently clear in their requirements particularly on British aided, roads and bridges projects.
3. The depth of a client relationship was influenced by the type of project undertaken. A stronger service orientation was seen to be observed in some large consulting firms undertaking T T but contractors were little affected. T T was regarded as being fully part of a firm's mainstream expertise in all quarters. Medium sized firms were not seen to conduct T T better than larger firms.
4. Joint ventures and consortia were usually involved in T T projects. The integrated type of joint venture was favoured. Subsidiary offices were quite necessary for obtaining T T, but not necessary for conducting it.
5. T T was seen to have considerable long term benefits for consultants but little for contractors and suppliers. There was a similar benefit in the short term, although this was less pronounced. Market information could be gathered and markets penetrated T T projects.

8.1 EXTENT OF COVERAGE OF CASES

Although the cases in Chapter 7 were described in a qualitative manner, each participant was also asked to identify three or more projects and to provide specific information on the project's country, year, sector discipline, client, sponsor,

value, office location and form of TT. Under these headings, several tables and figures were compiled which indicate the setting and scope of the information provided across each of the cases.

Geographical Areas

In the interviews, projects were spread across some fifty countries altogether, as shown in Table 8-1. Usually each interviewee covered entirely separate countries in their project descriptions. Three quarters of the projects were situated in Africa (35%) and Asia (40%). The rest were found in the Middle East (12%) Europe (5%) Central America, Oceania, the Caribbean and South America (8%). (see Figure 8-1). The dominance of Africa and Asia was to be expected from the findings of earlier Chapters 1, 2 and 5, although a good number of developing countries (who are also the most likely to be in receipt of TT) are to be found in these two regions.

Sector Disciplines

There was also a wide spread of projects, across each of the 25 sectors disciplines as described in later classifications of the Consultants File. If anything there was a greater emphasis on roads, bridges and buildings which all figure prominently in developing country infrastructure priorities. Figure 8-2 shows a summary of separate project disciplines as recorded across the interviews.

Location and Form of T T

TT occurred in different offices: either the firm's home, the firm's subsidiary offices, the client's offices or that of the project itself. It also involved courses in home or client offices and courses at home universities or college. Due to the job position of the interview respondents, Case 13 covered the client's offices almost entirely and Cases 15 & 16 were restricted largely to the project offices, due to the nature of the contractors' construction role on a project.

Cases 1 to 12 only were therefore used to gauge the spread of the consulting location of TT (see Figure 8-3). The majority (two thirds) were split between client (19%), home (UK) (28%) and project (17%).

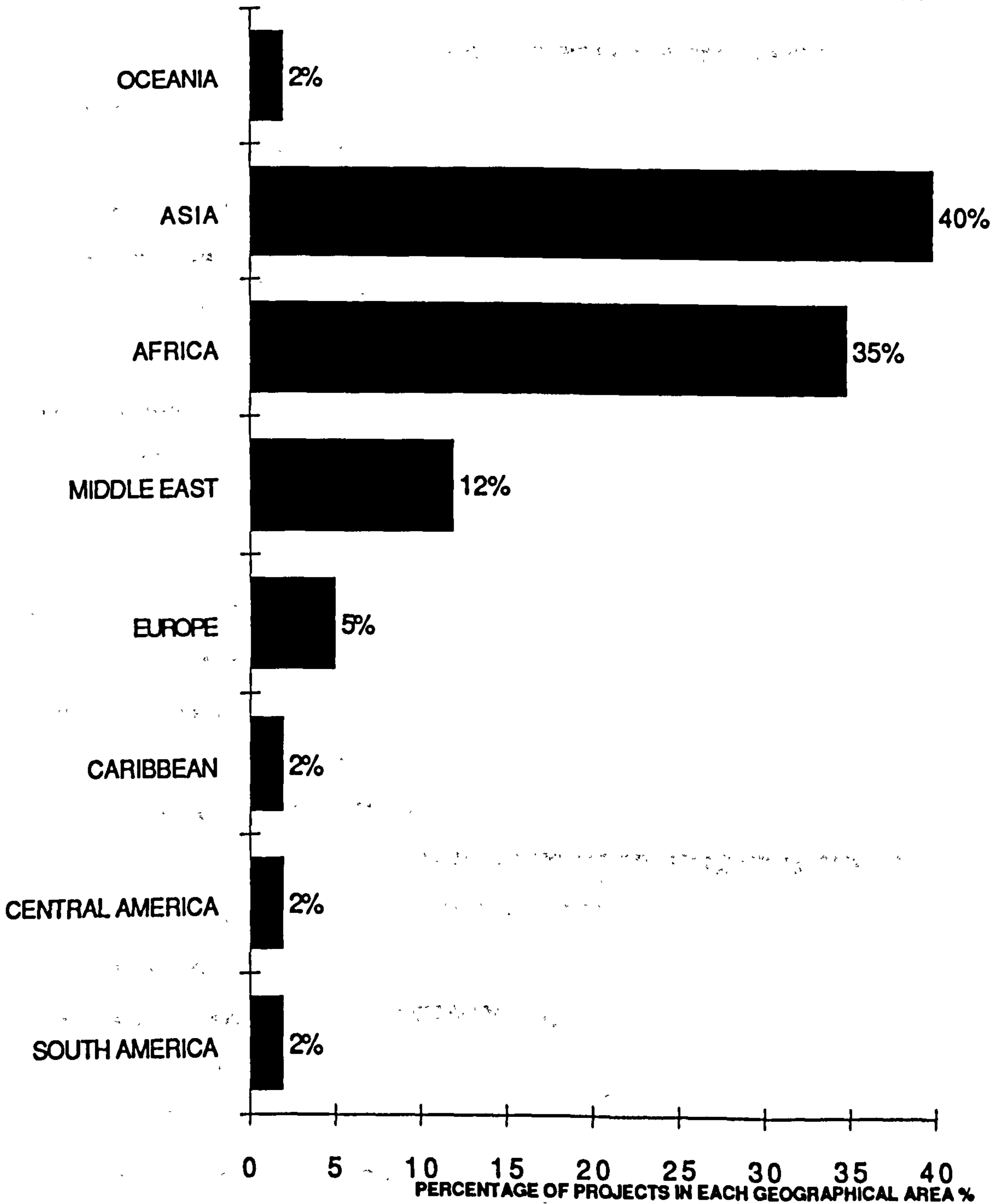
COUNTRY LOCATIONS OF PROJECTS
(Number of Projects in Each Country)

ARGENTINA	1	DUBAI	1
BELIZE	2	EGYPT	3
BOLIVIA	1	IRAN	1
CARIBBEAN	3	IRAQ	2
CHILE	1	KUWAIT	1
FALKLANDS	1	LIBYA	1
MEXICO	1	OMAN	1
		SAUDI ARABIA	5
CYPRUS	1	YEMEN (N)	2
GREECE	3		
PORTUGAL	2	BOTSWANA	4
TURKEY	4	ETHIOPIA	2
USSR	2	GHANA	3
		KENYA	3
		LESOTHO	1
BANGLADESH	8	MADAGASCAR	1
BURMA	1	MALAWI	1
CHINA	3	MALI	1
INDIA	5	NIGERIA	5
MAURITIUS	1	SIERRA LEONE	2
NEPAL	2	SOMALIA	2
PAKISTAN	4	SUDAN	3
SRI LANKA	3	SWAZILAND	1
VIETNAM (S)	1	TANZANIA	4
		UGANDA	4
PAPUA N.G.	3	ZAIRE	2
		ZAMBIA	6
		ZIMBABWE	2

Source : Author's Interviews

TABLE 8-1

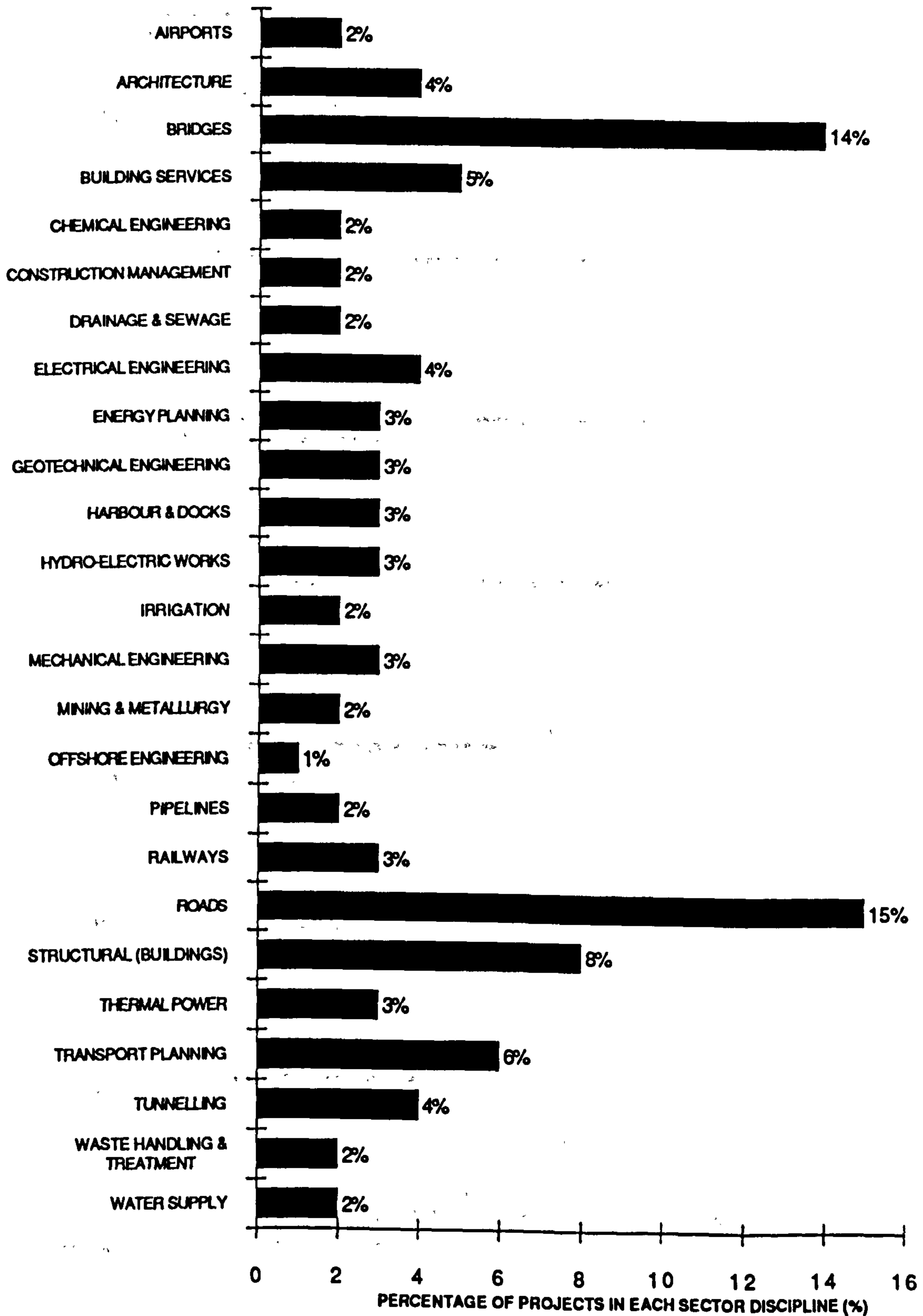
GEOGRAPHICAL REPRESENTATION OF PROJECTS



Source : Author's Interviews

FIGURE 8-1

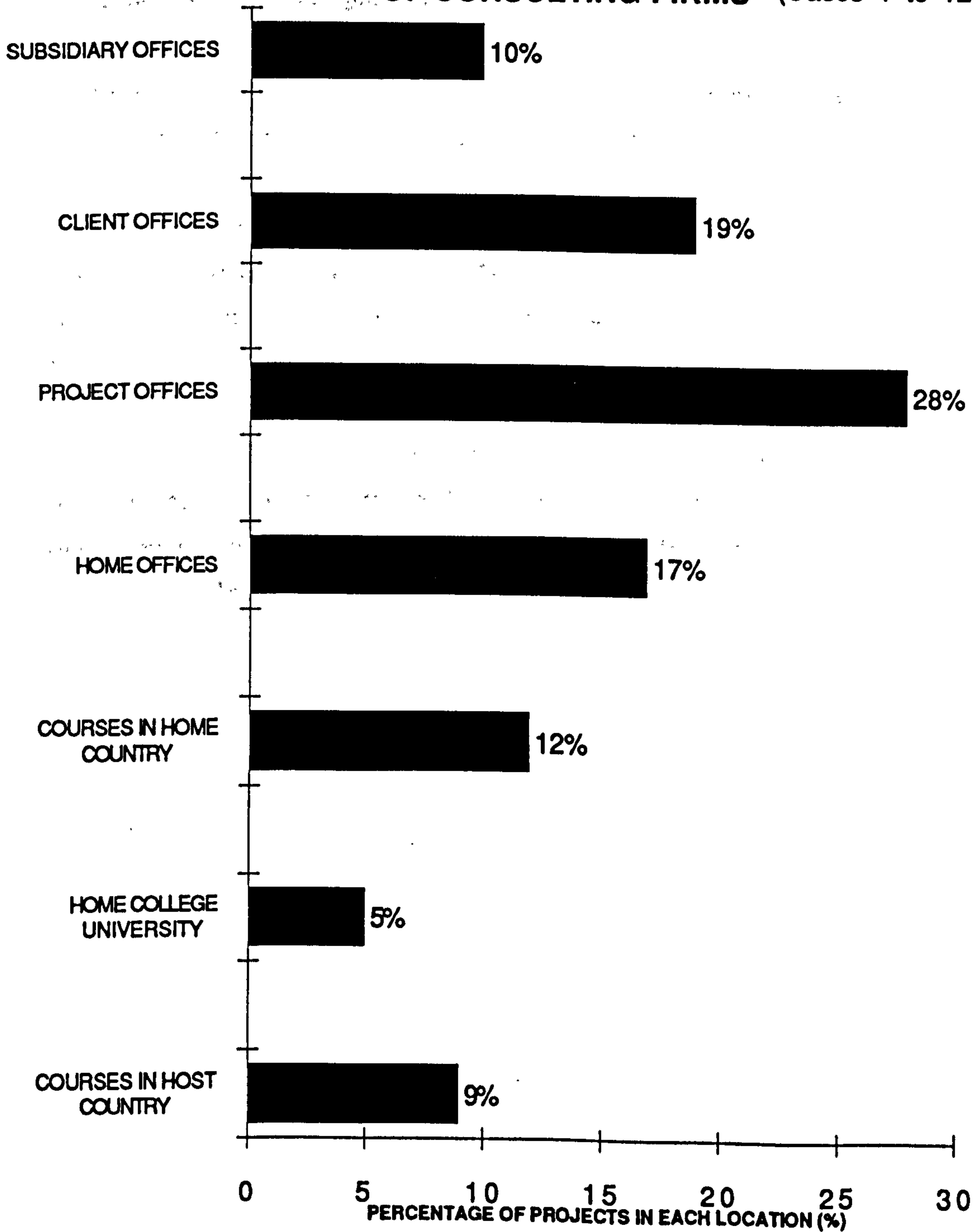
SECTOR DISCIPLINES OF PROJECTS



Source : Author's Interviews

FIGURE 8-2

**LOCATION OF OFFICES FOR TECHNOLOGY TRANSFER
OF CONSULTING FIRMS (Cases 1 to 12 only)**



Source : Author's Interviews

FIGURE 8-3

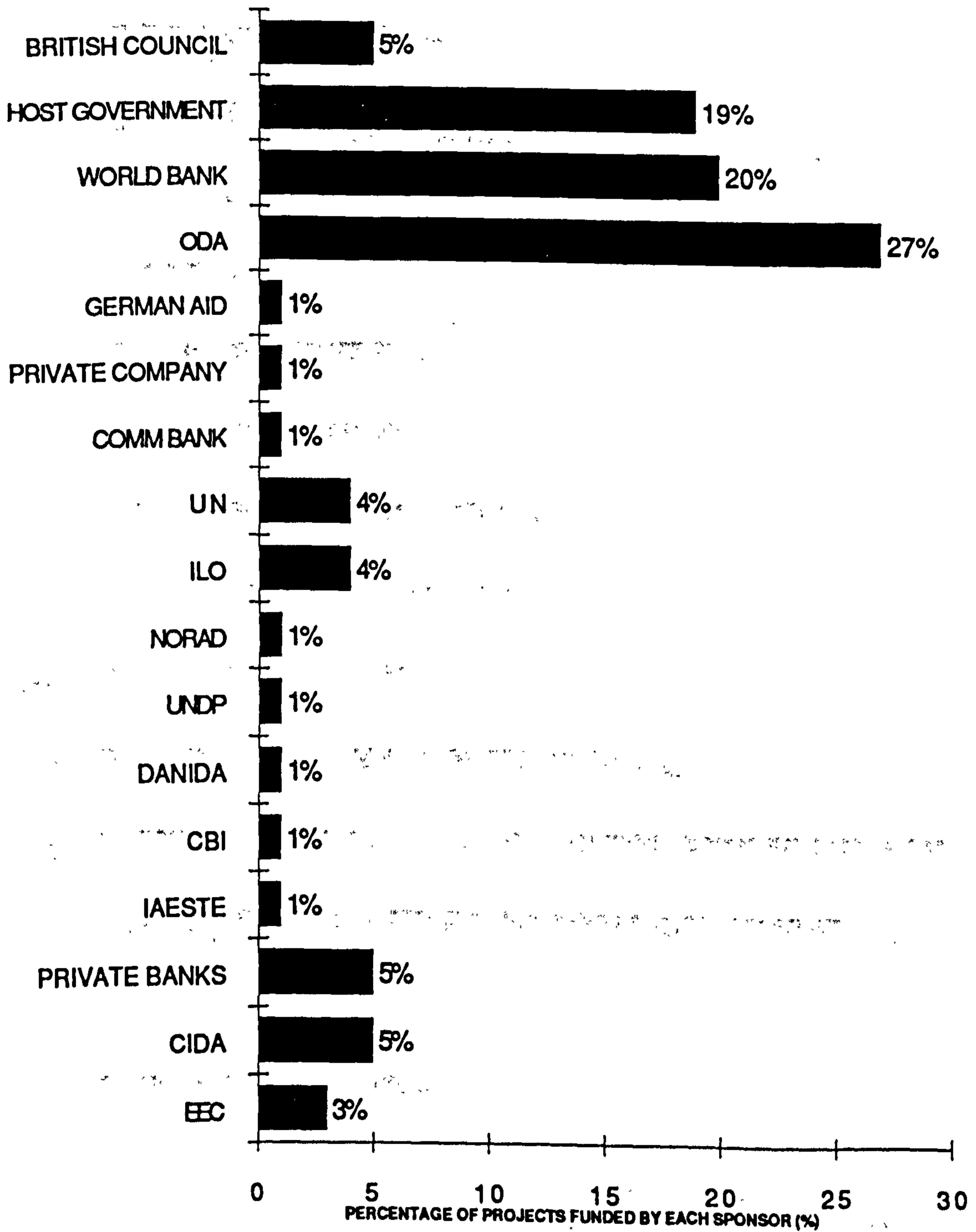
Sponsors, Value and Year of Projects

Information was also yielded on the funding sponsors (see Figure 8-4). These occurred with 17 separate agencies although the World Bank and ODA accounted for almost half, being 20% and 27% respectively. Client governments accounted for a fifth (19%) and the rest were supported by a variety of other aid bodies as well as banks and private organisations (7% between them).

Projects ranged in value from £700 million down to less than £1 million. (see Figure 8-5). Most of the time TT figured as anything from 1% to 5% of this project value, although a significant minority were 100% TT projects in their own right.

The majority of projects had taken place in the last 3 to 5 years and many of these were ongoing. Earlier projects in the seventies, amounting to about a tenth of the whole, proved useful in tracking the long term effect of TT where it had been observed. (see Table 8-2 and Figure 8-6)

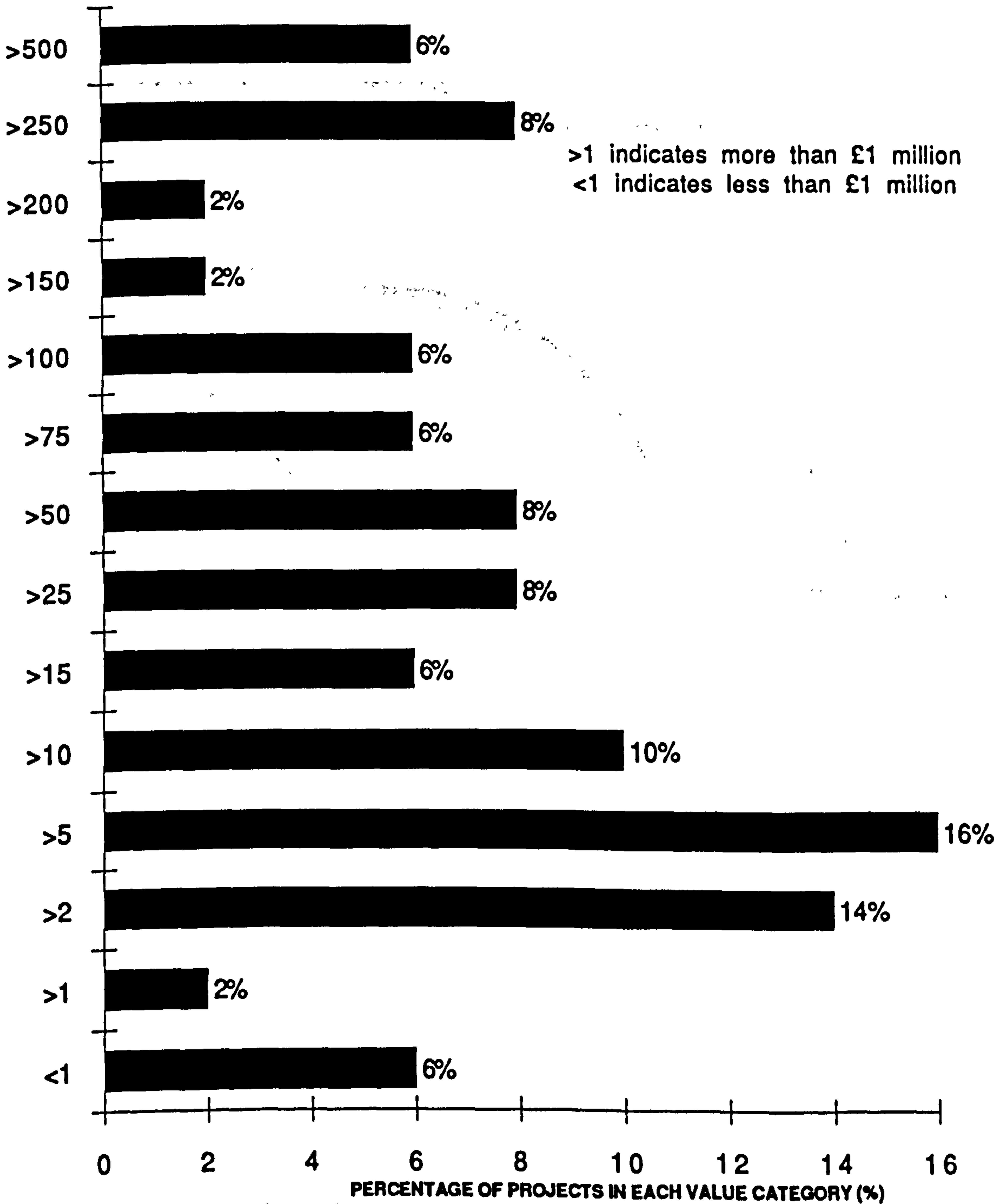
PROJECT FUNDING SPONSORS



Source : Author's Interviews

FIGURE 8-4

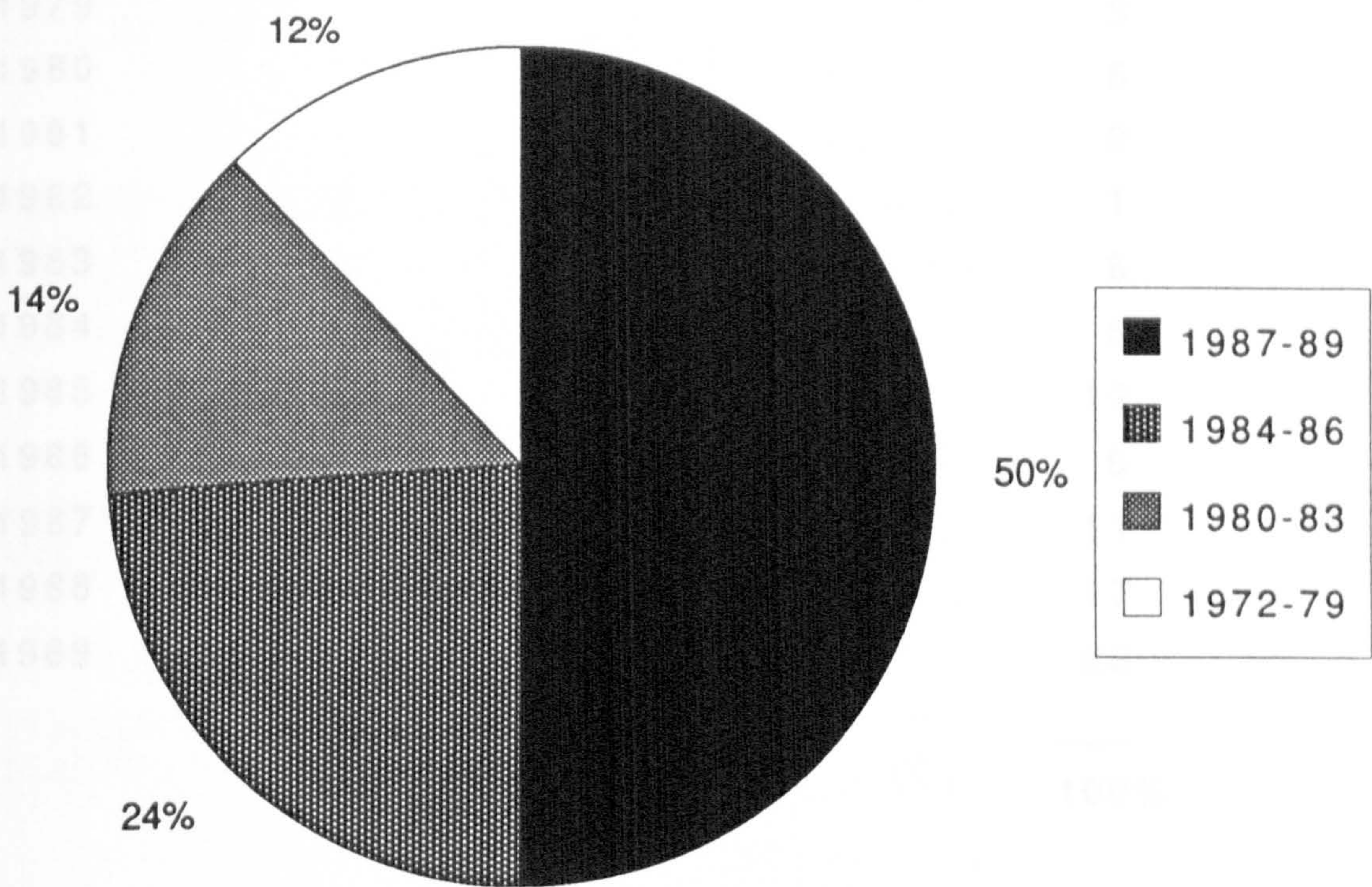
VALUE OF PROJECTS (£ million)



Source : Author's Interviews

FIGURE 8-5

PERIOD OF PROJECTS
PERCENTAGE OF PROJECTS IN YEARS SHOWN



Source : Author's Interviews

FIGURE 8-6

YEAR OF PROJECTS**% of projects in each year**

1972	1
1973	3
1974	
1975	
1976	1
1977	
1978	3
1979	3
1980	5
1981	2
1982	1
1983	6
1984	6
1985	12
1986	6
1987	11
1988	17
1989	23

	100%

Source : Author's Interviews

TABLE 8-2

DIVISION OF GROUPS - by Number of Interviews

ALL FIRMS (BY TYPE) (32)

CONSULTANTS	20 }	
CLIENT ORGANISATIONS AND AID AGENCIES	6 }	32
CONTRACTORS AND CAPITAL GOODS SUPPLIERS	6 }	

CONSULTANTS (20)

LARGE FIRM SIZE	10 }	20
MEDIUM FIRM SIZE	10 }	

BUSINESS OVERSEAS MORE THAN HALF	11 }	20
BUSINESS OVERSEAS LESS THAN HALF	9 }	

LARGE SIZE OF PROJECT (>£10M)	11 }	20
MEDIUM SIZE OF PROJECT (<£10M)	9 }	

TT IN CLIENT OFFICES & OTHER OFFICES	8 }	20
TT IN OTHER OFFICES	12 }	

BRITISH AID FUNDED	8 }	20
OTHER AID FUNDED & GOVERNMENT FUNDED	12 }	

ALL FIRMS (32)

AFRICA	17 }	32
ASIA	15 }	

ROADS & BRIDGES DISCIPLINES	17 }	32
OTHER DISCIPLINES	15 }	

Source : Author's Interviews

TABLE 8-3

8.2 INTRODUCTION TO DISCUSSION OF HYPOTHESES

While Chapter 7 covered the cases individually, this chapter analyses the hypotheses under their main headings adopting the same order as earlier. For consultants, results are classified by firm size, level of business overseas, size of project, location of office for technology transfer and aid funding. For all firms, results are classified by type of firm and then by geographical area and project discipline. Table 8.3 indicates the number of interviews which refer to each of these categories. In the Appendix, Tables A-5 to A-8 quantify the level of support obtained for each of these.

8.3 NATURE AND EXTENT OF TECHNOLOGY TRANSFER : DISCUSSION

N1 "Technology transfer involves more of the transfer of management "know-how" forming part of the total project system than of the actual "technology" itself".

For consultants this was strongly supported (95%). (see Figure 8-7). Technology transfer was a term in current usage which had become increasingly evident in the last 10 years and more so in the last 5 years. Management know-how relating to technical, organisational, managerial and contract inputs, (Table 8-4) as opposed to technology, formed the majority of the total TT input. Know-how was requested on the supervision of all stages of large projects, and of international contractors, of seminars, of coordination of infrastructure as well as the intangibles such as professionalism. The technical areas referred to in Table 8-4 were by no means a reflection of the full range of skills of the consultants but they were some that were mentioned by way of illustration: examples being project appraisal, complex bridge design, urban planning etc. "Technology" itself (see Table 8-5) which proved hard to dissociate from technical knowledge, found description mostly under information technology and computer databases & software with very occasional mention of provision of hardware. Systems linked to piling, tunneling, dredging, mapping, agriculture and mining were all referred to.

For consultants there was little difference across any of the main headings of firm size, level of internationalisation, project size etc. It was strongly held that TT was more management know-how rather than technology.

For client organisations and aid agencies (100%), there was unanimous support for this view.

For contractors and suppliers, there was almost similar agreement (83%) on the nature of TT, indicating a slightly less positive view due to the higher capital intensity of their business.

For all firms overall, Asia (100%) leaned to TT being more of management know-how than Africa (88%). All disciplines were equally supportive (94%), of this too.

N2a "Technology transfer is a mandatory part of construction projects".

For consultants this was hardly supported (50%). (see Figure 8-8) Where TT was not mandatory, many consulting firms had been offering it anyway as a part of the policy. It was mandatory in Malaysia but not, for instance, in Malawi, Botswana or Libya.

For the different headings of consultants, there was considerable divergence of views. The more internationalised firms were far more persuaded (82%) that TT was mandatory than the less internationalised firms (11%). Equally those on large projects (67%) were more persuaded than those on medium and smaller projects (44%). Where TT was conducted in client offices (38%), there was much less of a feeling that TT was mandatory compared to those that did not operate there (58%).

For all client organisations and aid agencies (50%), there was similar agreement with consultants.

For contractors and suppliers, there was far stronger evidence that TT was mandatory (100%), probably because the sheer visibility of their work lent itself more to a requirement by the client for TT; also there would be a greater assumption that this work could be learnt more readily.

For all firms overall, the view (59%) was that TT was mandatory. This was seen to be much more likely in Africa (71%) than Asia (47%); also in roads and bridges (47%) it was much less required than in other disciplines (73%).

N2b "Technology transfer is encouraged more by the aid agencies than the host countries themselves".

For consultants overall this was unsupported (30%). (see Figure 8-9) The representation of aid agencies and host governments is shown in Figure 8-4. Of these the strongest encouragement seemed to come from the World Bank and regional aid banks.

There were one or two instances of inappropriate activity on the part of agencies but usually they (particularly the ODA) were described as coming very close to the needs of countries, achieving value for money, approving realistic designs and being sufficiently vigilant in follow-up work by checking on project progress. Some host governments were particularly interested in TT and sought to obtain far more from aid projects than was originally intended. There was no doubt that the agencies were bringing influence to bear quite strongly in certain quarters but they could not force the hand of disinterested client governments, although most governments wanted the money that came to them from aid anyway. Notably, each of the aid agency interviews were positive on TT being mandatory, in their domain, with the greater call for TT coming from aid sources.

For the different headings of consultants, there was least support, for TT being encouraged by the aid agencies, from medium sized firms (10%) rather than larger firms (50%). Similarly there was less support from those working in client offices (13%) than those working elsewhere (42%). This was probably because those in client offices were likely to be the most aware of clients' interests in TT; also medium sized firms were the ones who were most likely to be found there. Those consultants working mainly on British aided projects saw a little less encouragement from the aid agencies (25%) than those working on other funded projects (33%) which conflicts to some extent with what aid agencies and client organisations said themselves. Large firms (50%) and those working in client offices (42%) observed more of a tendency for aid agencies to support TT but this was still unsupported.

Both client organisations and aid agencies (67%) provided the greatest support for the view that TT was encouraged more by the aid agencies than the host countries. It is likely this is more of an informed view than the very different one expressed by consultants themselves (30%).

For contractors and suppliers, an equal interest was seen to be coming from both clients and agencies (50%). The view of these parties on this matter could be less informed, however, because they tend to have less direct dealings with both client and agencies than consultants, due to the contract system.

For all firms overall (41%), and for the geographical areas and disciplines, there was a uniform lack of support that TT was encouraged more by aid agencies than host countries.

N3 "Host country clients are not clear as to their requirements for technology transfer".

For consultants this was supported (60%). (see Figure 8-10) but there were frequent mentions of a lack of client clarity (Table 8-6). Clients could be vague and untargetted in their requirements, and they could also try to add on extras further to that agreed by an aid budget. The shrewder consultants had learnt to be around client offices to achieve suitable expression for their TT proposals, taking account of any "hierarchy of needs" that had to be addressed in these organisations. Often this required further definition after a project had been obtained.

For the different headings for consultants, there was slightly more support from those working more in client offices (63%) than those who were not (58%) that host country clients were not clear in their requirements. Those working on British aided projects were the most convinced (75%) that host clients were not sufficiently clear in their requirements although those working on other funded projects were less sure (50%).

For client organisations and aid agencies (67%) there was support for the view that the client was not always very clear which was much on a par with what all the

other consultant groups said. Perhaps this reflected an acknowledgement that some clients found it difficult to be very specific even at the best of times.

Contractors and suppliers did not see the issue clearly one way or the other (50%). Arguments could occur with a client over the minimum core of knowledge that a local person might reasonably be expected to offer, once a construction contract was let. Clients tended to go by academic qualifications but contractors judged an individual on whether he could handle a job based on experience, often in a fast moving project environment.

For all firms overall, the view (59%) was that clients were not clear in their requirements. This found greater support in Asia (67%) than in Africa (53%). Roads and bridges (76%) seemed to experience a greater lack of clarity from clients than other disciplines (53%).

Following in the wake of lack of client clarity, nearly every case had considerably more to say on "lack of appropriateness" on projects due to four main criteria: technology related issues, organisational aspects, client disinterest and cultural factors. (Table 8-7). A majority of the technology related issues were contributed by contractors and suppliers (Figure 8-11).

Technology could be too sophisticated and not be in tune with the environment to which it was exported. Client, firms and agencies all admitted some past blame: Japan, Germany and USA were each seen to be pushing high tech projects which were out of keeping with their environments, while Eastern Europe was dumping unsaleable goods. From an organisational point of view, many host countries had a steady flow of aid project appraisals offered to them which often ended up being funnelled through one overstretched works ministry whenever construction was involved. There was much insistence upon experienced expatriate staff but even here some unsatisfactory transfer occurred because projects were being completed at too fast a schedule. Some major agencies were criticised for being too rigid in their expenditure procedures; sometimes they did not allow governments any leeway in falling behind with their side of a payment but aid bodies also had to watch that their funds did not "simply disappear" in the host country.

Many client organisations and their staff did not demonstrate enough interest or insist on the TT process being followed through. In Nigeria and Uganda, some personnel failed to report for projects to which they had been assigned. This was partly put down to their need to take another job because of poor local salaries. At a cultural level, in Central Asia, there appeared to be a disdain for over involvement at a practical level on a construction site. This was accompanied, not unsurprisingly, by a lack of confidence in bringing projects to fruition. Promotional prospects in other situations were generally not enhanced by TT as much as they might have been. Elsewhere, the need for TT was perpetuated by the regular promotion "out-of-post" of former recipients, or it was seen as a perk or reward where there was a chance to travel. Political bias and patronage were evident in places. Some local politicians overvalued prestigious projects and failed to look closely enough at the end result.¹

LEVEL OF SUPPORT FOR HYPOTHESIS (N1)

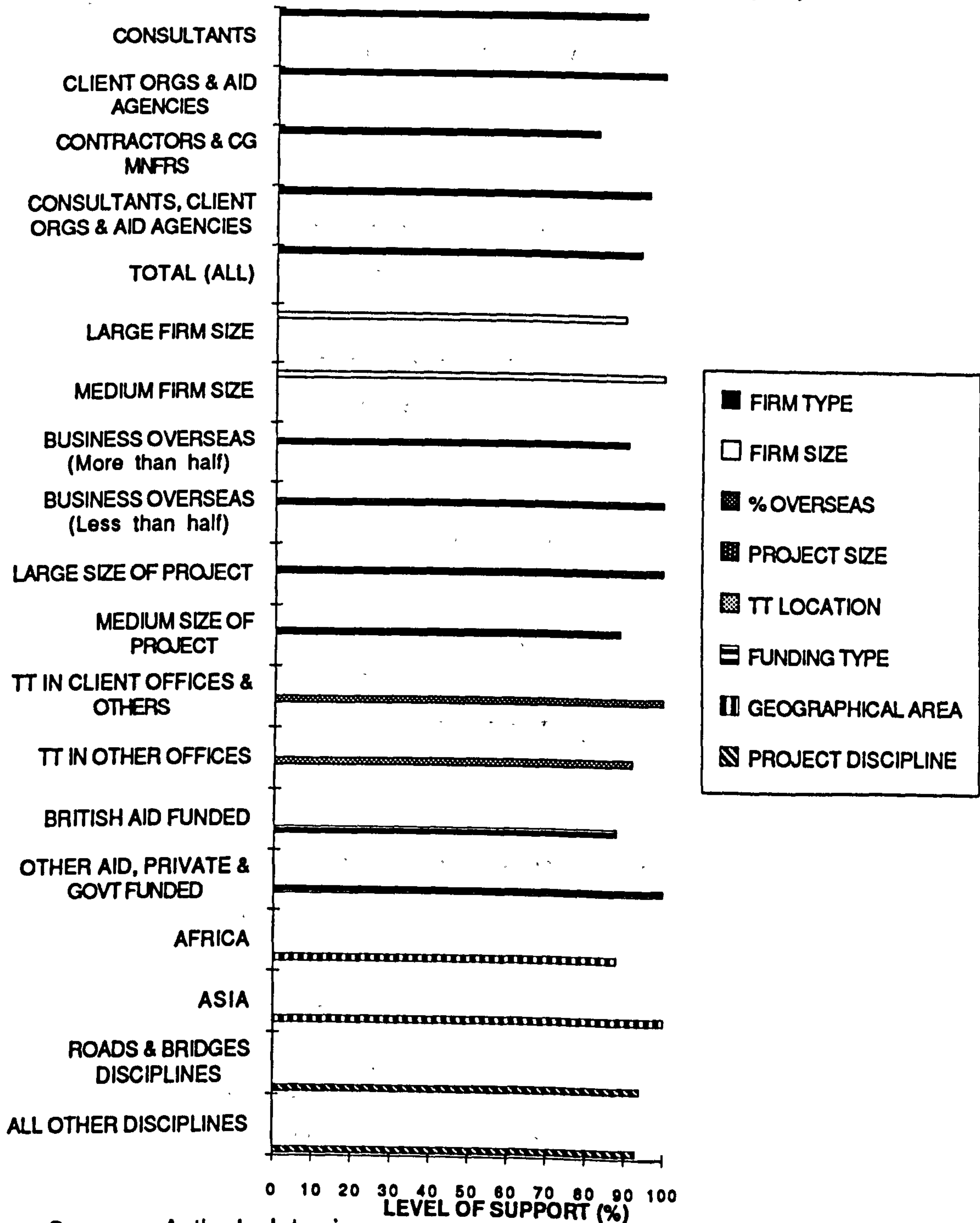


FIGURE 8-7

**THE MANAGEMENT AND KNOW-HOW RELATED PART OF TT PROJECTS:
EXAMPLES**

PROJECT MANAGEMENT
ADDITIONAL CAPACITY PROVISION
SUPERVISION OF INTERNATIONAL CONTRACTORS
ORGANISATION OF CONSULTING OPERATION
MARKETING THE CONSULTING FIRM
LEGAL AND ACCOUNTING
PROFESSIONALISM AND INDEPENDENCE ETHICS
INTERPRETATION OF DESIGN CODES
PRACTICAL DESIGN & CONSTRUCTION
RESEARCH KNOW-HOW OF CIVIL ENGINEERING PRODUCTS
INTERNATIONAL SEMINAR ORGANISATION
PLACING OF STAFF AT HOME UNIVERSITIES
REALISTIC PROGRAMMING
ORGANISATIONAL AND MANAGEMENT SKILLS
INSTITUTIONAL STRENGTHENING
SETTING UP ORGANISATIONAL COOPERATIVES
MAINTENANCE MANAGEMENT
BIDDING TECHNIQUES FOR INTERNATIONAL PROJECTS
INVESTMENT APPRAISAL

INFRASTRUCTURE DEVELOPMENT AND URBAN PLANNING
PRESTRESSED & WELDING
DREDGING
COMPLEX BRIDGE DESIGN
TALL BUILDING EXPERTISE
ELECTRIC POWER SHARING KNOW-HOW
WASTE DISPOSAL & POLLUTION EXPERIENCE

Source : Author's Interviews

TABLE 8-4

THE TECHNOLOGY RELATED PART OF TT PROJECTS: EXAMPLES

Consultants

INFORMATION TECHNOLOGY DATABASES
COMPUTER AIDED DESIGN
COMPUTER EQUIPMENT
SOFTWARE PROGRAMMES
COMPUTERISED SYSTEMS OF ROAD MAINTENANCE & DATA SYSTEMS
LASER SURVEYING
FARMING SYSTEMS & CROPPING PATTERNS DATABASES
GROUNDWATER MODELLING SOFTWARE
SATELLITE SENSOR SYSTEMS FOR MAPPING

Contractors

PILING SYSTEMS
WATERPROOF MEMBRANES
CONCRETE TRAINS
SLURRY TECHNIQUES

Suppliers

ON-STREAM ANALYSIS OF ORE SAMPLES
COMPLEX TECHNOLOGICAL EQUIPMENT
MINE LOADER TRANSMISSION EQUIPMENT
MARBLE CUTTING MACHINERY
VEHICLE PLANT
SMELTER

Source : Author's Interviews

TABLE 8-5

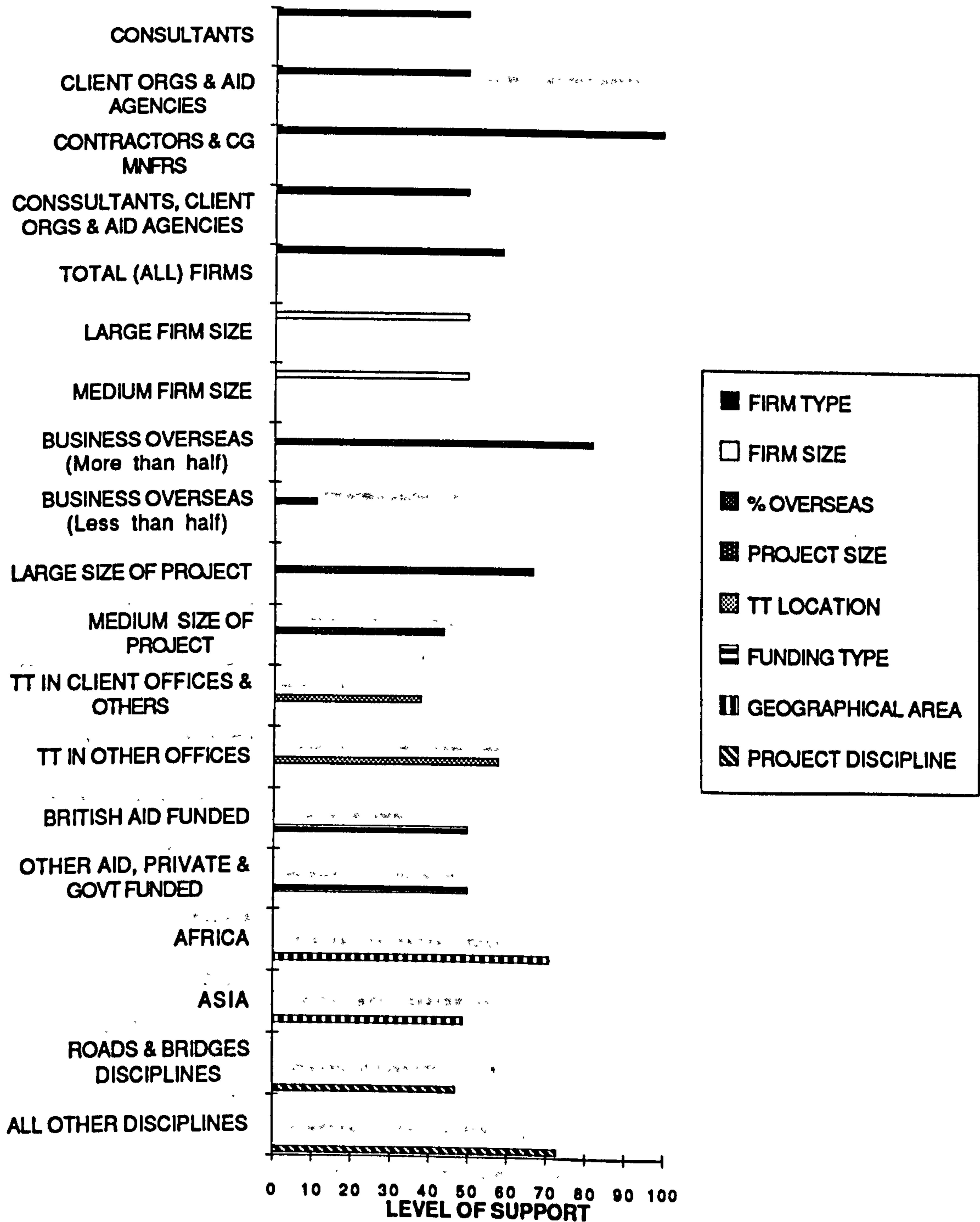
INSTANCES OF LACK OF CLARITY IN CLIENT SPECIFICATION

TERMS OF REFERENCE VAGUE AND UNTARGETTED
INTERPRETATION NEEDED AT BID STAGE OR AFTER PROJECT WON
CLIENT PRONE TO ADD IN EXTRAS
TT BOLTED ONTO BACK OF PROJECT
DIFFERENCE OF VIEW OVER INTERPRETATION OF AID BUDGET
LACK OF ATTENTION TO "HIERARCHY OF NEEDS"
DIFFERENCE OF VIEW OVER CORE OF CRITICAL KNOWLEDGE OF LOCAL STAFF
QUALIFICATIONS THE MEASURE RATHER THAN EXPERIENCE.

Source : Author's Interviews

TABLE 8-6

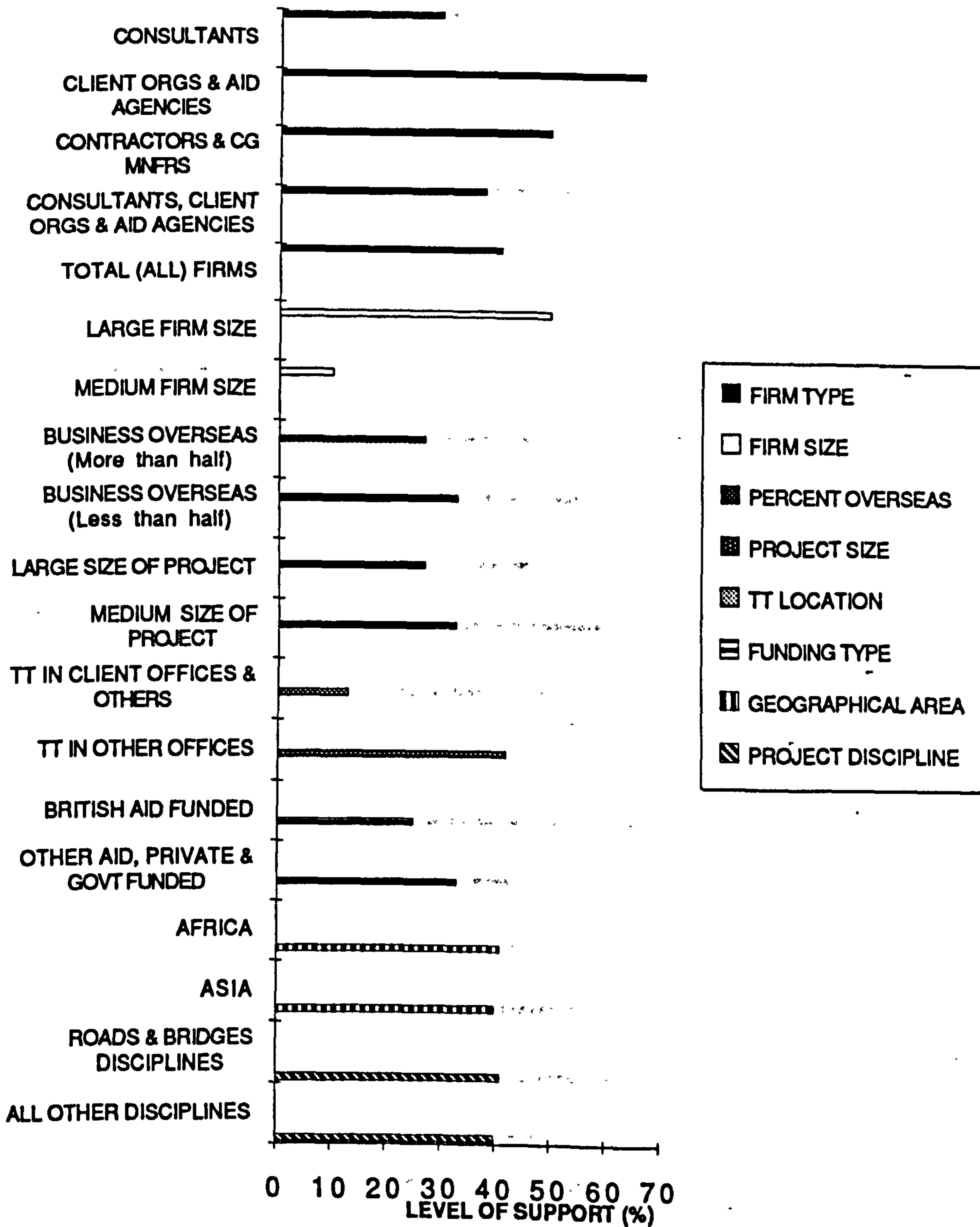
LEVEL OF SUPPORT FOR HYPOTHESIS (N2a)



Source : Author's Interviews

FIGURE 8-8

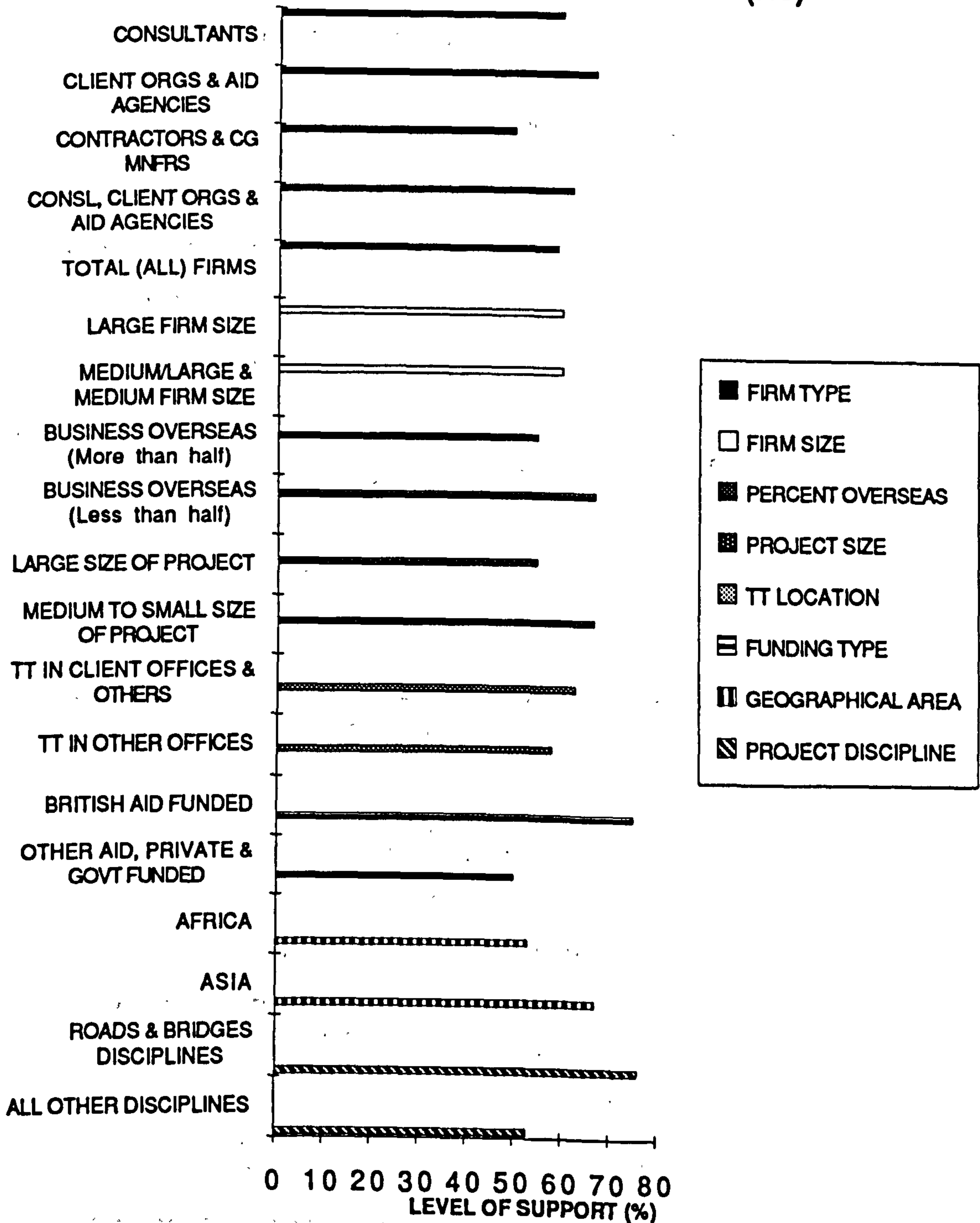
LEVEL OF SUPPORT FOR HYPOTHESIS (N2b)



Source : Author's Interviews

FIGURE 8-9

LEVEL OF SUPPORT FOR HYPOTHESIS (N3)



Source : Author's Interviews

FIGURE 8-10

INAPPROPRIATENESS ON PROJECTS **100%**

Technology Related Issues **26%**

OVER ADVANCED COMPUTERISED TECHNOLOGY REQUESTED OR IMPOSED
WESTERN AND EASTERN BLOC TECHNOLOGY OFFLOADED ON THIRD WORLD
LACK OF APPRAISAL ON ATP PROJECTS
HIGH BUILDINGS IN LOW LEVEL CITIES
PLANT INTENSIVE CONSTRUCTION METHODS
HIGH TECH JAPANESE AND GERMAN AID PROJECTS IN THIRD WORLD
UNMAINTAINABLE PROJECTS
LACK OF CROP PRODUCTION TO JUSTIFY AGRICULTURAL EQUIPMENT OUTLAY
PURCHASE OF UNWANTED EQUIPMENT DUE TO WB PRESSURE
CLIENTS' PREOCCUPATION WITH EQUIPMENT TO DETRIMENT OF TT

Organisational Aspects **22%**

OVER-INSISTENCE ON EX-PATRIATE STAFF WITH LENGTHY EXPERIENCE
CONCERN FOR FAST COMPLETION AT EXPENSE OF TT
OVERSTAFFING FROM ADVISER PERSONNEL
LARGE PROJECT PACKAGES ILL SUITED TO TT PROCESS
MULTIPLICITY OF AID AGENCIES "HAWKING" PROJECTS
TOO LITTLE COORDINATION AT LOCAL LEVEL OF AID PROJECTS
REQUIREMENT FOR SAME CONSULTANT PERSONNEL AS ORIGINAL PROPOSAL
OVER-RIGID SYSTEMS OF EXPENDITURE PAYMENT BY AID AGENCIES
FUNNELLING OF PROJECTS THRO' OVERSTRETCHED WORKS MINISTRIES
UNIVERSITY COURSE SECONDMENTS OVERLAPPING PROJECT IMPLEMENTATION

Client Disinterest **24%**

LACK OF SERIOUS INTEREST FROM ORGANISATIONS AND PARTICIPANTS
LACK OF COMMITMENT OR RESISTANCE BY CLIENT
INSUFFICIENT PROMOTION FOR LOCAL STAFF FOLLOWING TT
CLIENT PERSONNEL ABSENT
GAP BETWEEN CLIENT DECISION MAKERS AND TT RECIPIENTS
LACK OF CORRECT ASSIGNMENT OR RELEASE OF RIGHTLY SUITED STAFF
AID ADVICE IGNORED BY CLIENT IF LOAN PROJECT

Cultural Factors {Local (8%), Expatriates (20%)} **28%**

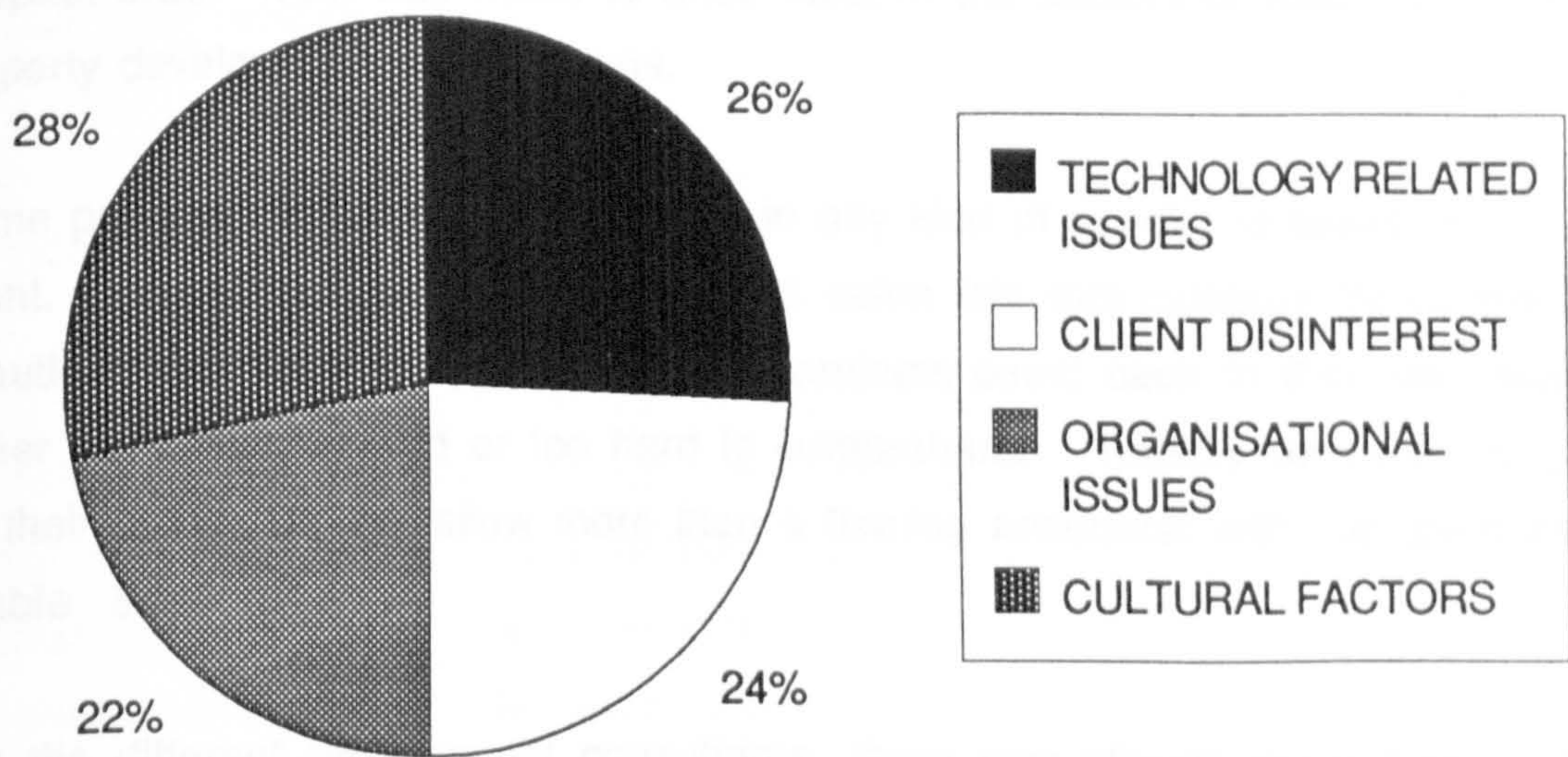
PERKS & ASSOCIATED TRAPPINGS OF TT
PRESTIGIOUS TECHNOLOGICAL PROJECTS
PATRONAGE AND POLITICAL BIAS IN APPOINTMENTS
SYPHONING OFF OF AID FUNDS TO OTHER PURPOSES
LACK OF PRACTICAL INVOLVEMENT AT SITE LEVEL
HOLIDAY ATTITUDE ON SECONDMENT TO HOME COUNTRY

LACK OF SOCIAL ADJUSTMENT TO LOCAL CONDITIONS
POOR COMMUNICATION SKILLS OF EXPATRIATES
DIFFICULTIES OF TECHNICAL ADJUSTMENT OF HIGH TECH STAFF

Source : Author's Interviews

TABLE 8-7

INAPPROPRIATENESS OF TECHNOLOGY TRANSFER PROJECTS



Source : Author's Interviews

FIGURE 8-11

8.4 TYPES OF PROJECT & FIRM : DISCUSSION

T1 "The depth of the relationship developed with the client during technology transfer is related to the type of project undertaken".

For consultants this was strongly supported (75%).(see Figure 8-12) (Table 8-8). "Creative" and "complex" projects in both a technical and organisational sense, according to some firms, gave opportunity for maximum client contact. At other times "problem solving" and "run-of-the-mill" projects also allowed this, as did those which were lengthy, large scale or regularly ordered. Sizeable demand in the present or foreseeable future usually attracted a firm strongly to a country. "Repeat order" work was noted to arise most in the sectors of road maintenance, property development and buildings.

Some projects did not lend themselves to any kind of special relationship with the client. "One-off" projects such as tunnels came into this category for contractors. "Routine" and "technically sophisticated" projects could each in their own way be either too straightforward or too hard to comprehend. "Rapidly delivered" projects by their nature, did not allow more than a fleeting encounter with the client either. (Table 8-9).

For the different headings of consultants, there was slightly more support from medium-sized firms (78%) than larger firms (71%) that the TT type of project enabled a deeper client relationship to develop, although the more internationalised firms seemed to support this more strongly (89%) than those with less work overseas (57%). (It could be said that the more internationalised firms are likely to be better informed; also this could be just as true of those firms not large in size because they may depend on the TT type of project more than the larger firms.) Those in client offices (67%) relied less on the type of project to form relationships with the client than those firms who were not (80%). Similarly those working on British aided projects (67%) found it less necessary to rely on the type of project to relate to the client than those who worked on other funded projects (80%).

For client organisations and aid agencies (100%), there was unanimous support for TT projects developing deeper client relationships.

Contractors and suppliers (100%) endorsed the view that the type of project made a difference to T T, although their relationship with the client tended to be more distant.

For all firms overall, there was a similar view as for consultants that the type of project did affect the relationship developed with the client. There was little difference between Africa (82%) and Asia (85%). Roads and bridges projects (77%) were seen to provide less of a deep relationship with the client than other projects (91%). This is perhaps surprising in view of the possibilities for client contact over extended periods on the former projects.

T2 "Technology transfer requires firms to become strongly service orientated".

This was well supported for consultants (65%). (see Figure 8-13) Greater service orientation showed through in the different kind of emphasis that firms gave to their business, which led many firms to structure themselves in units of sufficient size or focus to cater for a clients need. There was a strong requirement for involvement locally in the host country via TT, although as Figure 8-3 showed, a third of the projects cited similar involvement in the home country. There was frequent mention of the need for more senior staff with many years of experience behind them, with higher than average salaries, but these people also needed good communication skills and a capacity to adapt to a local environment. (Table 8-10).

One in three of the consulting firms were responding to the demands of TT by reorganising the firm into semi-separate or separate divisions (Table 8-11). In two firms, outside skills had been recruited at director level; in two further firms, the organisation had been particularly structured to take advantage of a smaller permanent organisation and lower overheads; making use of databases of self sufficient teams of senior experts. Other firms had experienced a disruptive effect to their UK operation. Few were able to place junior (or for some, even middle levels of staff) on overseas work abroad.

For the different headings of consultants, large firms felt the need to be more service orientated (80%) than medium sized firms (50%) possibly because it was more difficult for them to adapt to TT, although the medium sized project (78%) seemed to call for more service orientation than the larger project (55%).

Client organisations and aid agencies strongly supported (80%) the view that TT affected the service orientation of firms. Perhaps this was because they were more mindful of the need for a good service and consequently stressed it more than consultants (65%).

Contractors and suppliers by comparison were finding that TT had made far less impact (33%) on their organisations, the probable reason being that the productive effort of the work tended to eclipse the TT side of the work.

For all firms overall (61%), there was modest support for the view that firms had to become strongly service orientated to carry out TT. Asia (71%) seemed to require more service orientation than Africa (53%) and roads and bridges (75%) called for a much greater service from firms, compared to other disciplines (47%). This is perhaps unexpected because roads, and bridges did not seem to generate a deep relationship with the client in return, as was discussed under T1.

T3 "Firms cannot be 'technology transfer specialists' alone; technology transfer has to be a by-product of their mainstream business expertise".

For consultants, this was strongly proven (95%).(see Figure 8-14) The majority of firms saw themselves conducting TT in their own project areas of strength. Although many of the firms in the multispecialist category were on the look-out to extend the periphery of this expertise, this did not necessarily involve them in the process of TT, at this stage. To offer TT in their mainstream area of expertise was a major way that they could win work from an often very discerning client; policy capability statements in TT reflected this. If they could not do this, skills were acquired from outside the firm of senior people with a previous track record. Such firms were widening their expertise into institutional strengthening and agricultural areas. Management consultants and intermediate technologists were noted to be operating in areas not always first hand to them, the former not so

convincingly and the latter quite adequately. Creative ideas in TT packages were being put together through cooperation with Universities and banks (Table 8-12).

For the different headings of consultants, there was strong and uniform support for firms not hiving off the TT process to others. Medium sized firms (100%) felt this more keenly than the larger firms (89%) and those firms that were less internationalised felt the same (100%) when compared to the more internationalised firms (91%). On larger projects there was a real need (100%) to be fully in command of the business a little more than on medium sized projects (89%). Those conducting TT in client offices (100%) believed just as strongly that TT could not be subconsulted and this was felt similarly by those not located in client offices (92%). British aided projects (100%) reflected the same view compared to other funded projects (91%). Even given these slight differences, there was a near total support under all headings that TT had to be a by-product of the firm's mainstream business.

Client organisations and aid agencies (80%) were surprisingly the least supportive of all groups for subconsulting the TT service. Perhaps even given some of the criticisms levelled by clients and agencies in the earlier chapters, they had tried out management consultants on work which was new to them and found they could handle some kinds of work adequately.

In the contractor and supplier firms there was unanimous agreement (100%) that TT needed to be mainstream to their business. This was an unexpected response seeing the amount of subcontracting that takes place in contracting. Suppliers felt strongly that TT should not be hived off and that it would always be closely linked to the equipment product itself.

For all firms overall, there was very strong support (93%) for TT being part of their mainstream expertise. No differences were observed between either of the geographic locations or groups of discipline.

T4 "Medium-sized firms conduct technology transfer more satisfactorily than larger firms".

For consultants this was not supported (35%).(see Figure 8-15) A comparison of the advantages attributed to large and medium-sized firms appear in Table 8-13 and Table 8-14. Larger firms were described as possessing a wide breadth of specialisms at their disposal "in-house". They also had a larger capacity to draw upon a greater pool of staff, if necessary at short notice, and had less difficulty in providing TT to several groups of host country personnel at home. They also had to recruit fewer experts from outside their organisation and had little need to join in consortia with other firms (except on mega-projects, when the client might demand it in order to spread the risk). (Table 8-13)

An equal number of merits were cited for medium sized firms but these appeared to carry less weight overall. For instance, a more personal service could be offered at a senior level to recipients of TT and they could be assimilated more easily into a firm for genuine productive experience. A faster response to clients' needs was possible due to fewer levels of bureaucracy in the firm. The smaller firms appeared to be quite adept at organising particular specialisms and they were often found to offer something high-tech., although it seemed to be the very large firms who could pull in world leading experts to convince a client of their case. (Table 8-14)

For the different headings of consultants, there was slightly less lack of support for the view that TT projects were carried out more satisfactorily by larger firms (33%) than by medium sized firms (38%). Equally there was a similar view shared by more internationalised firms compared to less internationalised firms; this was also the same for those conducting large sized projects compared to medium sized projects. The similarity in these responses is probably due to medium sized firms actually themselves being more likely to be less internationalised and more likely to work on medium sized projects. However, all of these headings were actually not supportive of medium sized firms. For firms working in client offices (67%) there was far more positive support for medium sized firms, compared to those (18%) who did not work there. This was probably because the medium sized firms were the most likely to operate there. There was

little difference between British aided (33%) or other funded projects (36%) in their lack of a support for medium sized firms.

For client organisations and aid agencies (67%), there was the greatest support for medium sized firms being able to conduct TT better. This in fact was interestingly the reverse of consultants' views on the matter, which may suggest there could be more of a niche for medium sized firms overseas with clients and agencies than consultants may realise.

Contractors and suppliers fully discounted the view that medium sized firms offered more in TT than large firms (0%). This was because a smaller number of larger firms were operating in overseas sectors compared to consulting, who are represented by a wide range of firms abroad. Contractors in the medium sized category are to be found predominantly in the domestic market; suppliers less so.

For all firms overall, there was a lack of support (32%) for TT being done satisfactorily by medium sized firms. However Africa (20%) did not seem to favour medium sized firms at all, although Asia (50%) found them marginally satisfactory. Similarly roads and bridges (50%) projects seemed much more suited to medium sized firms than other disciplines (15%). Notwithstanding this apparent marginal support for medium sized firms, the overall view was that larger firms were better placed than medium sized firms to conduct TT.

LEVEL OF SUPPORT FOR HYPOTHESIS (T1)

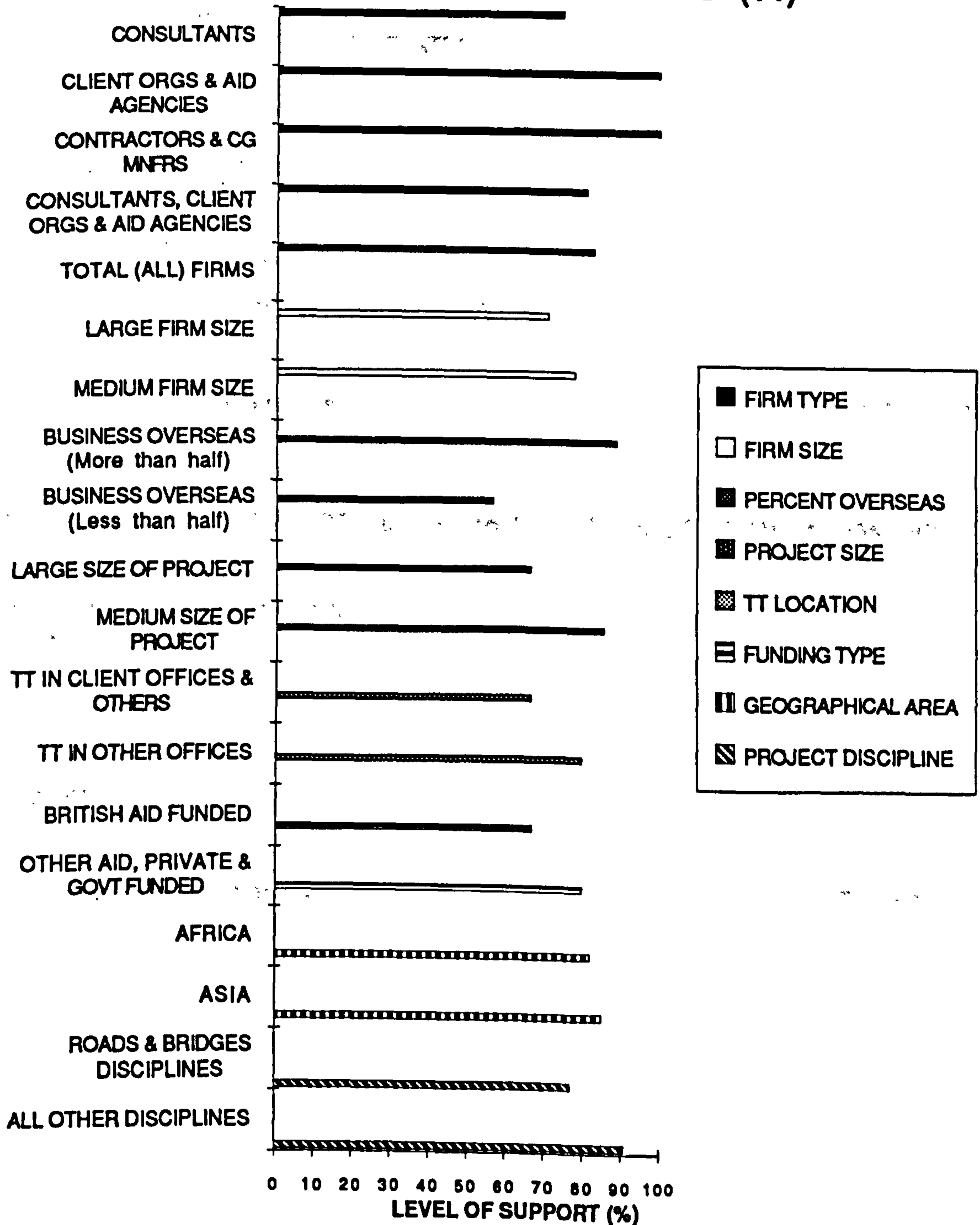


FIGURE 8-12

TYPES OF PROJECT leading to DEEPER RELATIONSHIP WITH CLIENT

RUN-OF-THE-MILL
LENGTHY BY NATURE
ORGANISATIONALLY & TECHNICALLY COMPLEX
TECHNICALLY CREATIVE
MAINTENANCE MANAGEMENT RELATED
REGULAR ONGOING COMMITMENT
PROBLEM SOLVING
LARGE SCALE
SIZABLE IN DEMAND

BASIC INFRASTRUCTURE
ROAD MAINTENANCE
PROPERTY DEVELOPMENT & BUILDINGS

Source : Author's Interviews

TABLE 8-8

TYPES OF PROJECT NOT leading to DEEPER CLIENT RELATIONSHIP

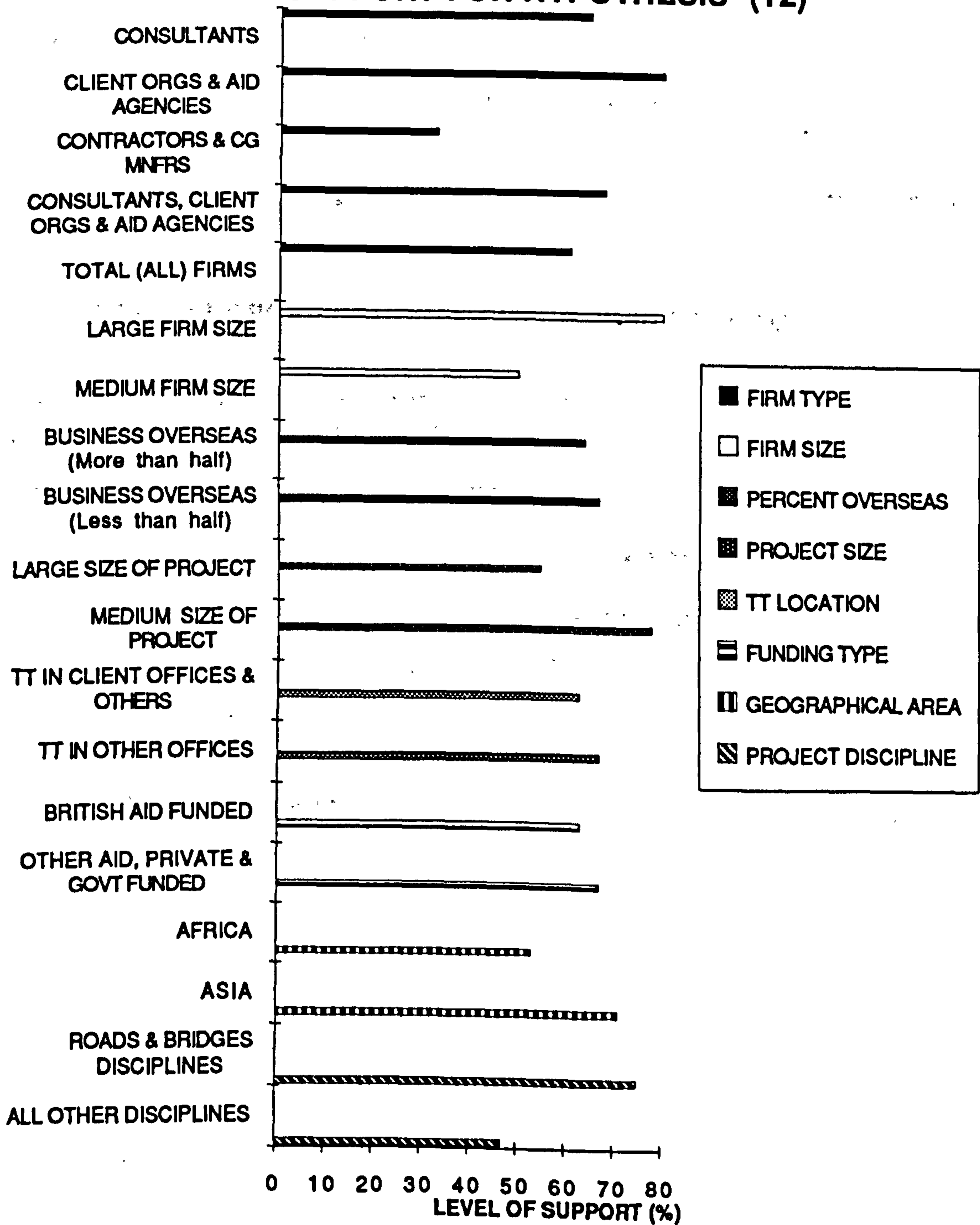
TECHNICALLY SOPHISTICATED
RAPIDLY DELIVERED
ONE-OFFS
ROUTINE

TUNNELS

Source : Author's Interviews

TABLE 8-9

LEVEL OF SUPPORT FOR HYPOTHESIS (T2)



Source : Author's Interviews

FIGURE 8-13

INSTANCES OF STRONGER SERVICE ORIENTATION

**REQUIREMENT FOR LOCAL INVOLVEMENT
EMPHASIS ON EXPERIENCED STAFF
HIGHER AVERAGE SALARIES FOR STAFF
WILLINGNESS FOR LESS RAPID DELIVERY
CONCENTRATED SEMINAR INPUTS
COMMUNICATION SKILLS STRESSED
TT SUCCESS STRONGLY LINKED TO CALIBRE OF STAFF**

Source : Author's Interviews

TABLE 8-10

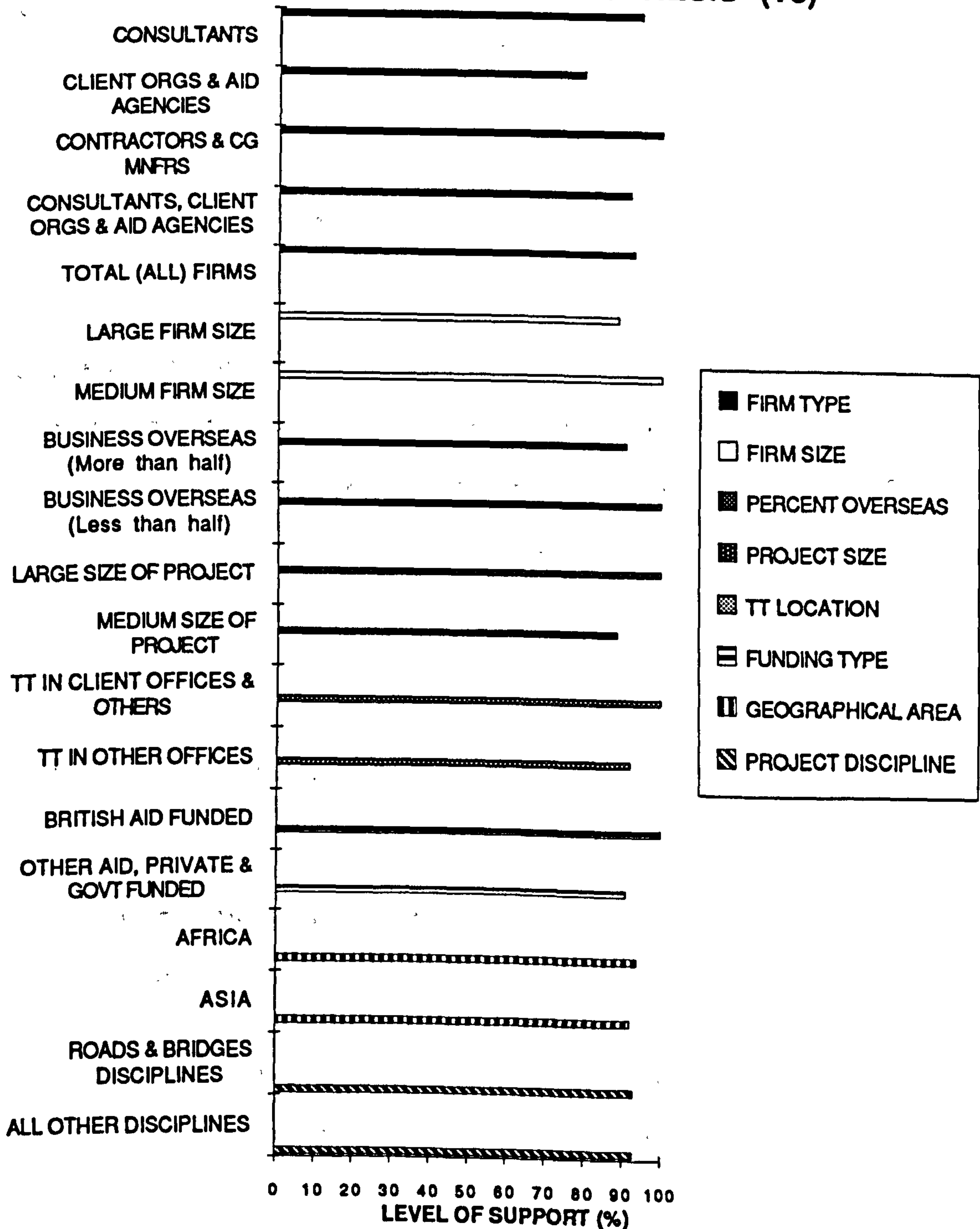
CHANGES FOR ORGANISATIONAL EMPHASIS IN TT PROJECTS

**DISRUPTION TO HOME/HQ PRODUCTIVE EFFORT
SEPARATE UNITS IN TT ESTABLISHED
TEAMS OF SELF SUFFICIENT EXPERTS
DATABASE POOL OF CONTRACT STAFF POSSIBLE
SMALLER PERMANENT ORGANISATIONS
TT WORK NOT SUPPORTING CONVENTIONAL PYRAMID STRUCTURE
SKEW OF PERSONNEL TO SENIOR STAFF
DEARTH OF OVERSEAS EXPERIENCE FOR YOUNGER & MIDDLE STAFF
UK PROJECTS GEARED TO EARLY TT TRAINING FOR STAFF
CHANGE IN EMPHASIS ON RECRUITMENT
LOWER OVERHEAD ADMINISTRATION NEEDED**

Source : Author's Interviews

TABLE 8-11

LEVEL OF SUPPORT FOR HYPOTHESIS (T3)



Source : Author's Interviews

FIGURE 8-14

INSTANCES OF EXPANSION OF TT EXPERTISE BEYOND MAINSTREAM SKILLS

- CREATIVE IDEAS FOR TT PACKAGES
- SPECIFIC RECRUITMENT FOR TT PROJECTS
- BUY-IN OF EXPERTISE IN AGRICULTURAL SECTOR
- INSTITUTIONAL STRENGTHENING
- INTERMEDIATE TECHNOLOGY
- MANAGEMENT CONSULTANTS' ADDITIONAL SKILLS
- COOPERATION WITH UNIVERSITIES AND BANKS

- REHABILITATION AND BUY-BACK AGREEMENTS

Source : Author's Interviews

TABLE 8-12

ADVANTAGES OF LARGE FIRM

	%
FULL BREADTH OF SPECIALIST SUB-UNITS & DIVISIONS OFFERED	28
LARGER POOLS OF STAFF TO DRAW UPON	20
MORE EXPERT PERSONNEL AVAILABLE AT SHORT NOTICE	13
WIDE COORDINATION POSSIBLE ACROSS FIRM'S REGIONAL NETWORKS	13
HOME STAFF HAVE MORE TIME FOR MANY LOCAL STAFF SECONDMENTS	13
LESS NEED TO RECRUIT IN SKILLS	6
LESS NEED TO CONSORT WITH OTHER FIRMS	7
TOTAL	100

Source : Author's Interviews

TABLE 8-13

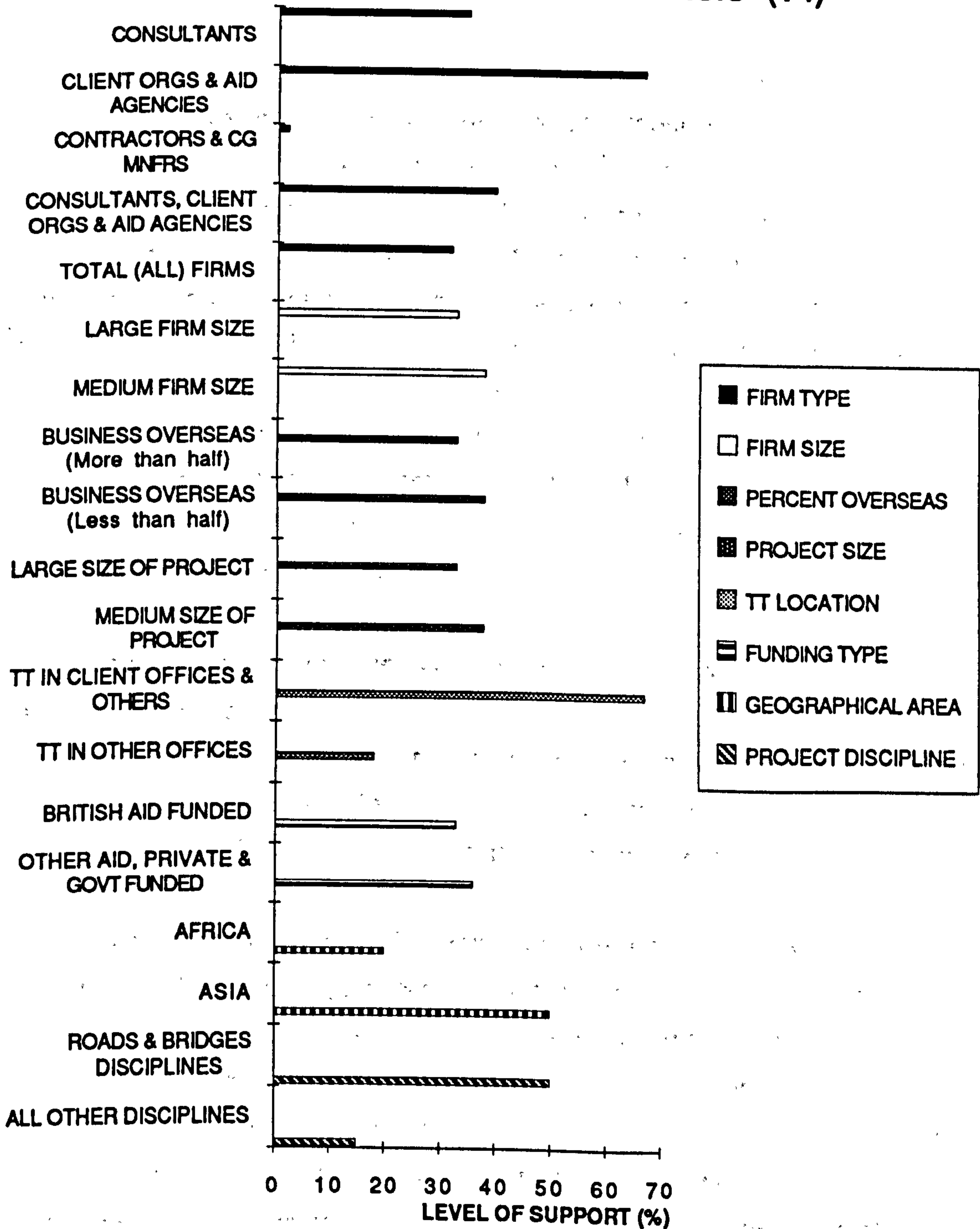
ADVANTAGES OF MEDIUM SIZED FIRM

	%
LACK OF BUREAUCRATIC STRUCTURE AND PROCEDURES	40
BETTER ABILITY TO RESPOND QUICKLY TO CLIENT NEED	13
MORE PERSONAL ATTENTION AT A SENIOR LEVEL	13
ABILITY TO CONCENTRATE ON SPECIALISMS SOMETIMES HIGHTECH	13
RECIPIENTS OF TT EASILY ASSIMILATED INTO FIRM	13
POSSIBLE TO ORGANISE A RANGE OF EXTERNAL EXPERTISE	8
TOTAL	100

Source : Author's Interviews

TABLE 8-14

LEVEL OF SUPPORT FOR HYPOTHESIS (T4)



Source : Author's Interviews

FIGURE 8-15

8.5 COOPERATIVE ARRANGEMENTS : DISCUSSION

A1. "To conduct technology transfer projects, it is necessary to become involved in joint ventures and consortia".

For consultants this was supported (60%). (see Figure 8-16). First on the list of these cooperative arrangements were invariably those of local consultants in the host country. Some dozen countries, mostly middle income, were particularly mentioned in this context (Table 8-15). (In some of these countries a joint venture was a clear requirement). Firms used these liaisons primarily as opportunities to gain greater influence in the country and to assess local conditions better at first hand. They also found it useful to keep their costs lower, obtain assistance in bidding and gain access to local resources in staff skills. On such joint ventures, there was an adverse side as well: local consultants were something of an unknown quantity in terms of both the firm itself and the quality of its technical and managerial staff, which affected the performance outcome of the project. (Table 8-16 and Figure 8-17).

UK consultants also turned to other developed country consulting firms in joint ventures, the major factors being a need to enter into a consortia due to a project's size, a need for strong host country representation, special expertise or access to financial sources. (see Table 8-17). (These consulting firms came from UK, France, Australia, Canada, USA, Denmark, Germany, Holland and Portugal).

It was widely accepted that UK contractors were not so globally evident as UK consultants. This was due, in part, to third world countries competing with greater facility, and doing so for reasons of foreign exchange. There was also more emphasis by UK contractor firms on management contracting overseas rather than "straight construction"; at home the UK domestic market of the late eighties was proving more of a draw than it had done in the past. It was not surprising therefore that joint ventures extended to several other nationality contractors but the reasons given (Table 8-18) were different from those of other nationality consultants: German and Italian contractors valued the independence and expertise of UK consultants. French, Yugoslav and British companies turned to them on

design & construct/turnkey TT projects and Swedish, British and German firms cooperated with them through a variety of aid finance arrangements.

One of the firms was giving a particular emphasis on equity participation via "boot" projects. This was not popular with UK consultants however. (Table 8-19). (Figure 8-18). Where it was found, firms usually were asked to put up the cost of their fees as front end risk but little more would be offered by them, the reasons being their lower capitalisation and unfavourable company structure. The ACE rules of engagement were seen as having discouraged such moves in the past. In Africa it was observed that the government clients themselves were not showing much enthusiasm either for these measures.

For the different headings of consultants, there was much stronger support (82%), that joint ventures and consortia were needed on TT projects from firms who were more internationalised (82%) than those who were less so (33%). Perhaps this reflected a real conviction and an informed view on the part of those who were involved abroad in joint ventures already. Medium sized projects (67%) seemed to reflect more of a need for joint ventures and consortia than larger projects (55%) although there would seem to be little to support this view other than that the larger project would likely be done by one incoming firm on its own "alone" (excepting the very largest projects). Those firms located in clients' offices (50%) seemed to see less of a need for joint ventures than those which were not (67%). This was probably because they tended to function independently when they were in their offices. There was virtually no difference between British aided projects (55%) and other funded projects (58%) in their support for joint ventures on TT projects.

Client organisations and aid agencies supported joint ventures and consortia on TT projects (67%) a little more than consultants (60%) reflecting a known preference on the part of the client and sponsoring bodies for joint arrangements.

Contractors and suppliers showed a slightly greater propensity (67%) to participate in joint ventures and consortia than consultants on TT projects even though the normal link for suppliers (and manufacturers) was to establish a link with a local agent rather than other firms.

For all firms overall, there was support (63%) for joint ventures on TT projects. This was slightly stronger in Asia (67%) than Africa (59%) which is supported, by Table 8-15 which lists two countries in Africa and four countries in Asia where local consultants are prominent. Roads and bridges disciplines (59%) seemed to have generated less joint ventures than other disciplines (67%) although both supported the need of them.

A2 "Joint ventures lacking organisational integration and coordination do not assist the process of technology transfer".

For consultants this was strongly supported (87%). (see Figure 8-19) The advantages of the integrated joint venture, (shown in Table 8-20) indicate that closer cooperation was possible with greater commitment to project objectives. The venture could also exercise more authority with the lead party assigning duties to suit. On the other hand, unlike the non-integrated arrangement the reputation of each of the parties did not extend beyond the period of the venture, and each party could not link back easily to its own parent organisation for extra resources. There was a cost also to the lead party who had to provide a basis for common ground with the varied managerial and technological systems brought to the venture. In spite of all these disadvantages, the overwhelming view was that technology transfer worked best where maximum integrated coordination could be achieved most easily.

For the different headings of consultants, there was much stronger support for the integrated joint venture of TT projects amongst larger firms (100%) than the medium sized firms (75%). A similar pattern was observed for the larger projects (100%) as compared to the medium sized projects (71%). This suggests that the larger project (also attracting the larger firm) would give more opportunity to integrate all parties satisfactorily. This support was shared by those firms not located in client offices (100%). Those firms who were based there supported the integrated variety (67%) but less than other firms, probably because they did not regard themselves as being in a joint venture situation although they were well integrated with the client.

For client organisation and aid agencies there was a strong preference (100%) for a fully integrated joint venture where all the parties functioned together. This is

not surprising seeing that both these groups of parties are known to favour integration of local and international organisations.

There was a certain amount of support (67%) from contractors and suppliers but this group was actually the least in favour of full integration, most probably because they knew that full cooperation on a project between the international and local party could mean the disruption of the productive project effort when TT was involved.

For all firms overall, there was strong support (86%) for the integrated joint venture. This support was greater in Africa (91%) than in Asia (82%). On roads and bridges (83%) there was less support for full integration than in other disciplines (90%) indicating that, in the former, the TT process could tolerate a little more separation of the parties concerned.

A3a "Fully established subsidiary offices are needed to obtain project business involving technology transfer".

For consultants this was supported (65%) (see Figure 8-20) although a wide range of views were expressed on their importance. (Table 8-21 and Figure 8-21) Between a third and a half of consultant firms regarded them as essential (or important) and this was a crucial part of their policy. Networks of offices were a necessary "international" selling point and helped to establish the firm as "locally rooted" in clients' eyes. A further segment of firms regarded offices as helpful but not fundamental to obtaining work, although market development reports could emanate from them in some regions.

For the different headings of consultants, medium sized firms (70%) placed more value on subsidiary offices than the larger firms (60%) although it was the larger firms who actually possessed the wider network of offices. Perhaps the impression of offices amongst those who did not have so many of them was that they were more useful in obtaining TT work than actually occurred in practice. This was reflected by the less internationalised firms (67%), again being marginally more in favour of offices than those who were fully internationalised (64%). Predictably those firms who operated in client offices were less in favour (50%) of subsidiary offices for obtaining new work than those who operated elsewhere (75%). British

aided projects seemed to display slightly less need for subsidiary offices (63%) than other funded projects (67%) probably because lobbying from head offices in the UK counted for something in getting new work.

For client organisations and aid agencies, there was support (67%) for the view that subsidiary offices were needed to obtain TT projects. However this support was not as strong as might have been expected although it concurred with consultants' own view (67%) on subsidiary offices.

Amongst contractors and suppliers, and this was in contrast to all other groups, the need for subsidiary offices to obtain business was not well supported (33%). Generally this was because these offices were not seen as viable amongst contractors for extended periods due to a need to yield short term returns to shareholders. Suppliers seemed to be happy to work through agents in the first instance.

For all firms overall, there was support (59%) for subsidiary offices to obtain work. Interestingly this was stronger in Africa (65%) than in Asia (53%). Roads and bridges projects (63%) also seemed to have a greater need of subsidiary offices than other disciplines (56%).

A3b "Fully established subsidiary offices are needed to conduct technology transfer adequately".

There was little support for this hypothesis from consultants. (11%) (see Figure 8-22) TT was taking place in several types of location (as already partly indicated in Figure 8-3) but subsidiary offices did not contribute that meaningfully to how this was done, except in providing access to cheaper local staff resources and communication links with the rest of the firm's networks. The merits of each type of location are set out in Table 8-22.

Local consultants' offices were seen as being equally useful for some firms. Sometimes staff costs for low tech work could be as little as one fifth of UK figures. Compared to consultants' offices, TT in client offices was usually more formally organised. Incoming firms had the added advantage of keeping their own overheads down while they assessed clients' problems at first hand. Secondments to the client

of consultants' staff were usually made in an advisory role for the TT process although executive powers were never far away.

Project offices were regarded as very satisfactory places for TT since it was related practically to a construction environment. Courses and seminars could be conducted usefully in such offices but they could also be set up just as well in client or local consulting offices. Mega-projects could include quite sophisticated computer systems on the project location.

Information technology and computing facilities were, however, best accessed by TT recipients in the home offices, when wider experience would also be possible of larger worldwide projects, often using very different construction materials. Host country staff could expand their horizons best in a different managerial culture when they had interface with a concentrated range of home staff expertise and know-how. This permitted the mounting of courses and seminars in home offices which could be attended by short term senior people from overseas. Staff of middle seniority and below particularly benefitted from extended stays in home offices.

For longer periods, there were links with university and college programmes which held out the possibility of conferring degrees on the successful recipients, provided the courses were matched to their abilities. Many aid projects contained provisions for University sponsorship. It was noted that these budgets were not always being spent, or if they were, those sponsored tended to be sent overseas in the second half of a project; ironically this disrupted the opportunity for operational TT during the project itself.

For the different headings of consultants there was a uniform lack of support for subsidiary offices being needed to "conduct" TT. More internationalised firms saw marginally less value in subsidiary offices (9%) for TT than the less internationalised firms (14%). Again this may have been because of their favourable perception of offices to carry out TT work, when they did not have them. The medium size of project had no need of subsidiary offices (0%) although there was a little more need on the larger projects (20%). This may be because TT could be done independently in a project office and not have to depend on a subsidiary office back-up at all. From firms not working in clients offices (8%) the support for subsidiary offices as places to conduct TT was less than those who were based

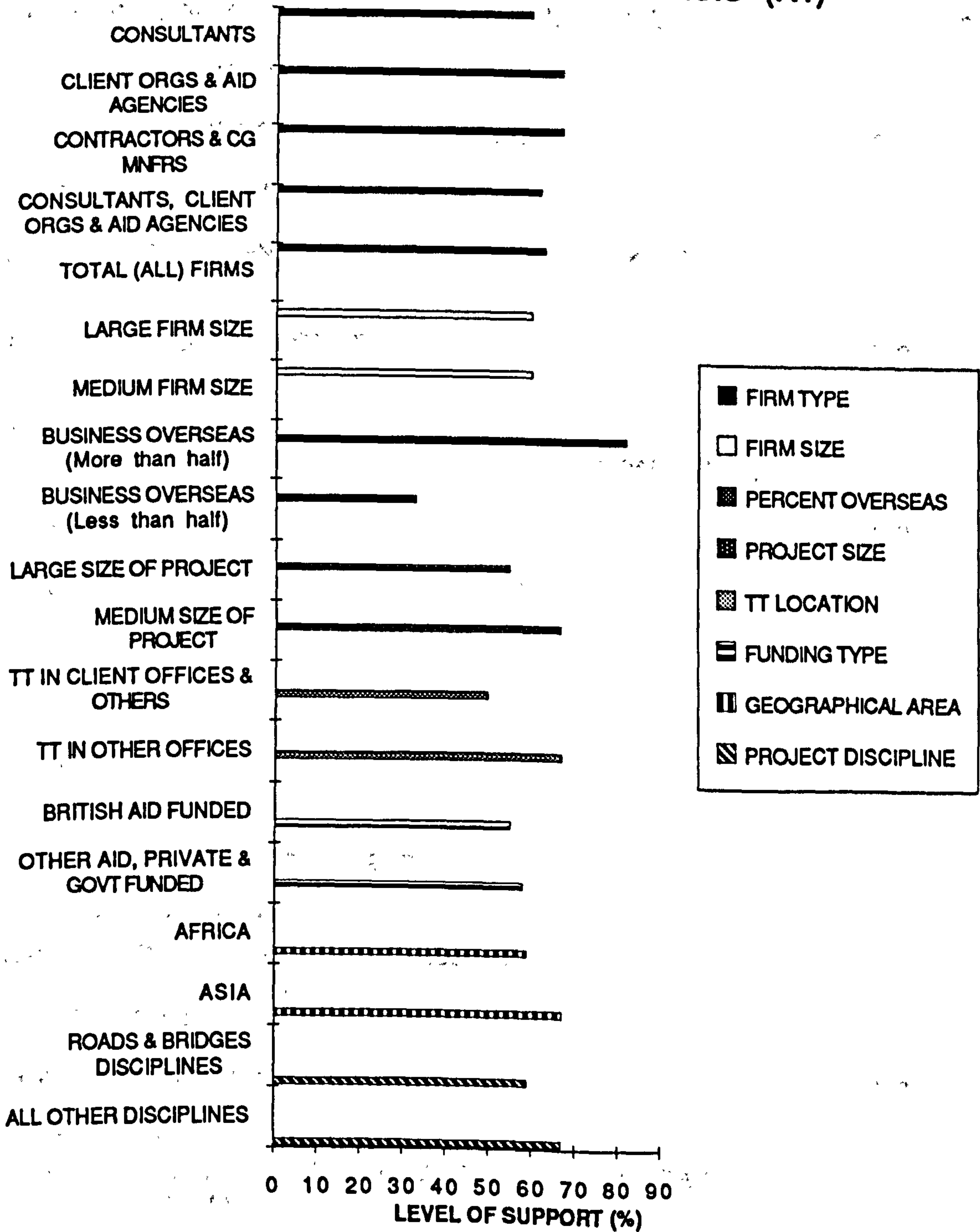
there (17%). Perhaps this reflected that some advantages were seen in being able to operate out of a subsidiary office, even for those who did not use them. Other funded projects had no need (0%) for subsidiary offices whereas British aided projects acknowledged some need of them (25%). This might reflect a British aid agency preference for consultants to have a representation or offices in an area.

Client organisations and aid agencies themselves surprisingly indicated no support whatever (0%) for TT being conducted in subsidiary offices. Most probably this would be because aid agencies saw the value of project offices, client offices and other locations and also because clients favoured consultants who worked as closely as possible with them especially in their own client offices or those of the project. Subsidiary offices allowed them very little opportunity to access TT know-how.

Contractors and suppliers saw just as little value in subsidiary offices for conducting TT as consultants (17%). By far the majority of contractors' TT work was done in project offices, and suppliers tended to bring host country staff back to the home country, where the fullest technology related facilities were easily on hand at their manufacturing plants.

For all firms overall, there was a lack of support for the hypothesis that offices were needed to conduct TT (10%). A little less support was registered in Asia (7%) than in Africa (13%). Similarly roads and bridges (6%) needed less access to subsidiary offices than other disciplines (17%), this probably being due to their more scattered locations.

LEVEL OF SUPPORT FOR HYPOTHESIS (A1)



Source : Author's Interviews

FIGURE 8-16

COUNTRIES WHERE LOCAL CONSULTANTS PARTICULARLY MENTIONED

MEXICO	NIGERIA	KENYA	TURKEY	GREECE	IRAN
BANGLADESH		THAILAND	MALAYSIA	INDONESIA	

Source : Author's Interviews

TABLE 8-15

VALUE OF JOINT VENTURE WITH LOCAL CONSULTANT 100%

Advantages (78%)

GAINING INFLUENCE WITH THE CLIENT 28

POLITICAL INFLUENCE
 PAYMENT OF BILLS
 CLOSENESS TO CLIENT MINISTRIES & DECISION MAKERS
 ACCESS TO PREMIER

ASSESSING LOCAL CONDITIONS 22

DISCERNMENT OF CLIENTS' NEEDS
 ACCESS TO A LOCAL BASE
 LOCAL SOURCES OF KNOWLEDGE ON PRICES, STANDARDS ETC.

LOWER COSTS 12

STRAIGHTFORWARD DESIGN WORK DONE LOCALLY
 COSTS OF PROPOSALS CHEAPER
 OVERALL COSTS LOWER

BIDDING ASSISTANCE 8

ADVICE ON PROPOSALS
 FAVOUR IN SHORT-LISTING

ACCESSING LOCAL RESOURCE 8

TECHNICAL CAPACITY
 RECRUITMENT OF PERMANENT PERSONNEL

Disadvantages (22%)

LOCAL STAFF EXPERIENCE 17

SHORTFALL IN TECHNICAL STRENGTH
 LACK OF CERTAINTY ON CORE KNOWLEDGE OF LOCAL STAFF
 SLOW PACE OF WORK

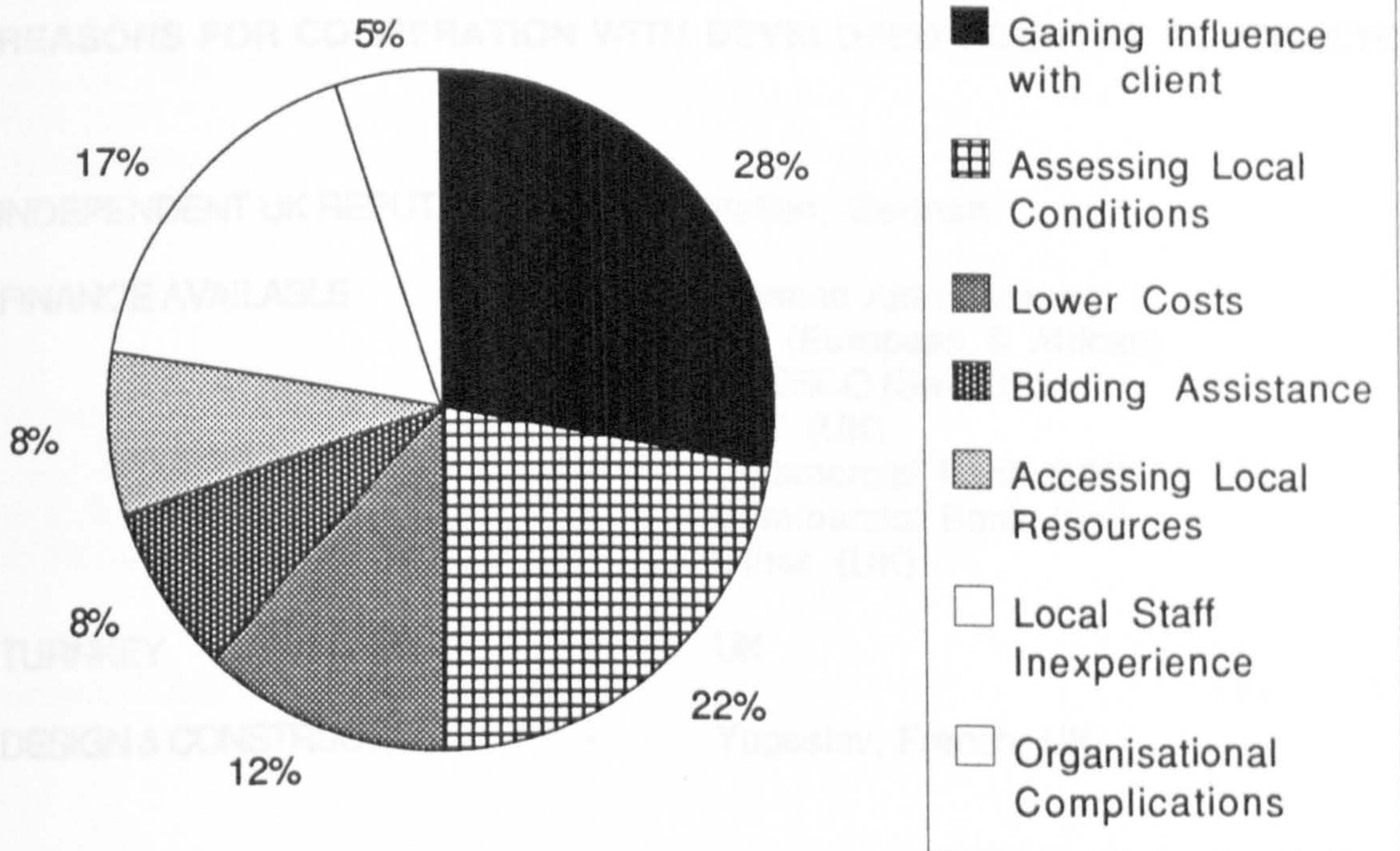
ORGANISATIONAL FACTORS 5

LOCAL PARTNERS ASSIGNED IN UNPLANNED FASHION BY CLIENT
 JOINT VENTURE HAS TO GENERATE OWN PROFITS FOR TT

Source : Author's Interviews

TABLE 8-16

ATTRIBUTES OF JOINT VENTURES WITH LOCAL FIRMS



Advantages (Shaded) 78%
 Disadvantages 22%

Source : Author's Interviews

FIGURE 8-17

REASONS FOR COOPERATION WITH DEVELOPED COUNTRY CONSULTANTS

LARGE SIZE OF PROJECT	-	Middle East Consortia
STRONG COUNTRY PRESENCE	-	Vietnam (French): Malaysia (Australian
EXPERTISE	-	Hydropower (Canadian):Mech Engrng(UK)
FINANCE	-	European with African firms
OTHER	-	Danes, Germans, Dutch, Portugese

Source : Author's Interviews

TABLE 8-17

REASONS FOR COOPERATION WITH DEVELOPED COUNTRY CONTRACTORS

INDEPENDENT UK REPUTATION	-	Italian, German
FINANCE AVAILABLE	-	German Aid (German)
	-	UN (European & African)
	-	UNESCO (Swedish)
	-	ATP (UK)
	-	Commercial Bank (UK)
	-	Commercial Bank (UK)
	-	Other (UK)
TURNKEY	-	UK
DESIGN & CONSTRUCT	-	Yugoslav, French, UK

Source : Author's Interviews

TABLE 8-18

EQUITY PARTICIPATION IN PROJECTS BY CONSULTING FIRMS

Extent of Participation (Cases 1 to 12)	100%
LARGE	8
MODERATE	8
SMALL	34
NONE	50

Instances

PROPERTY DEVELOPERS REQUEST SHARE
FEE COMMISSIONS OFFERED AS EQUITY
GROUP STRUCTURED TO OFFER EQUITY
BARTER DEALS IN LAND
BOOT PRIVATISATION DEALS

Reasons for Low Participation

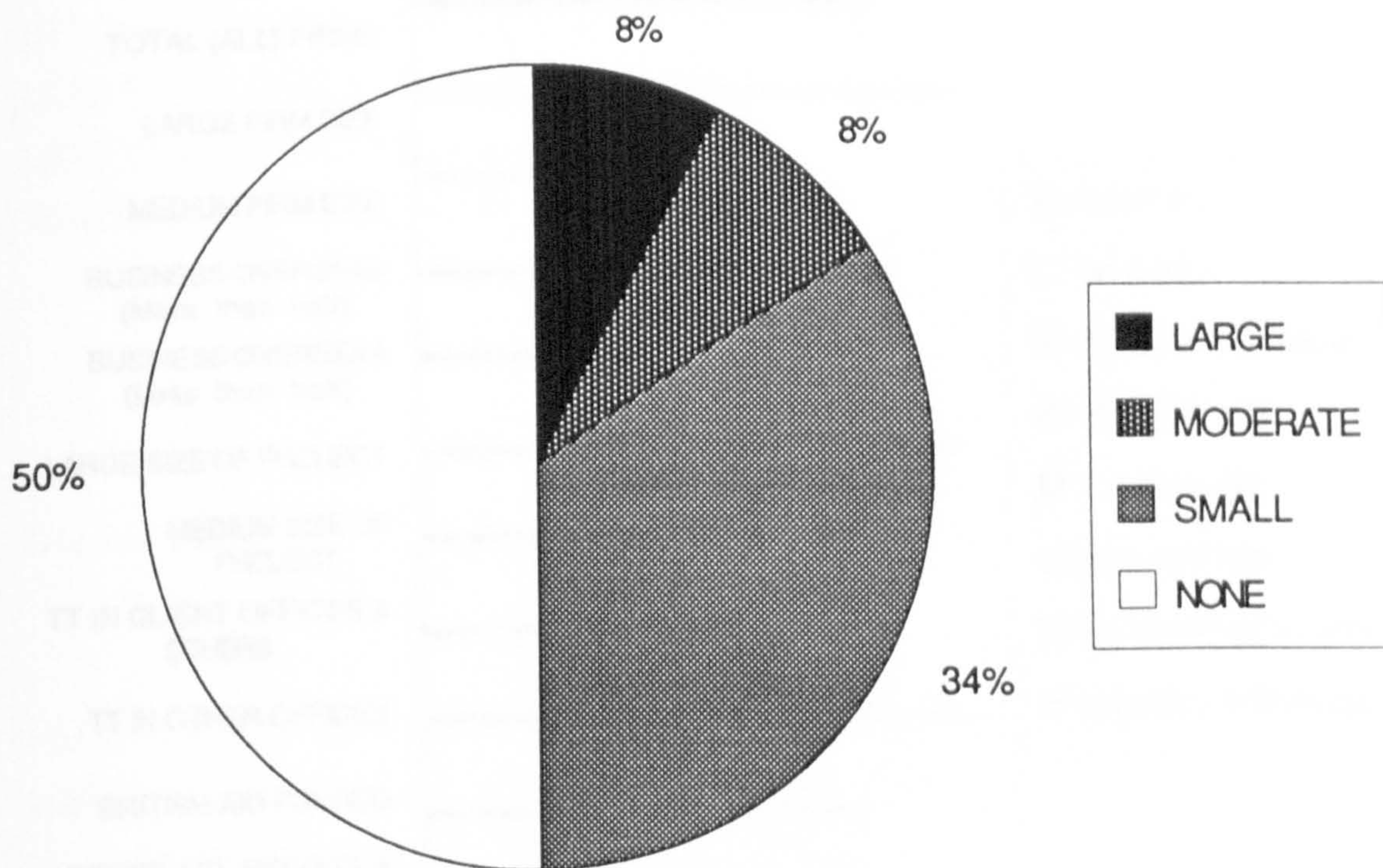
UNDERCAPITALISED POSITION OF FIRMS
INAPPROPRIATE COMPANY STRUCTURE
AGE RESTRICTIONS
AFRICAN GOVERNMENT CLIENTS NOT MUCH INTERESTED

Source : Author's Interviews

TABLE 8-19

EXTENT OF EQUITY PARTICIPATION IN PROJECTS BY CONSULTING FIRMS

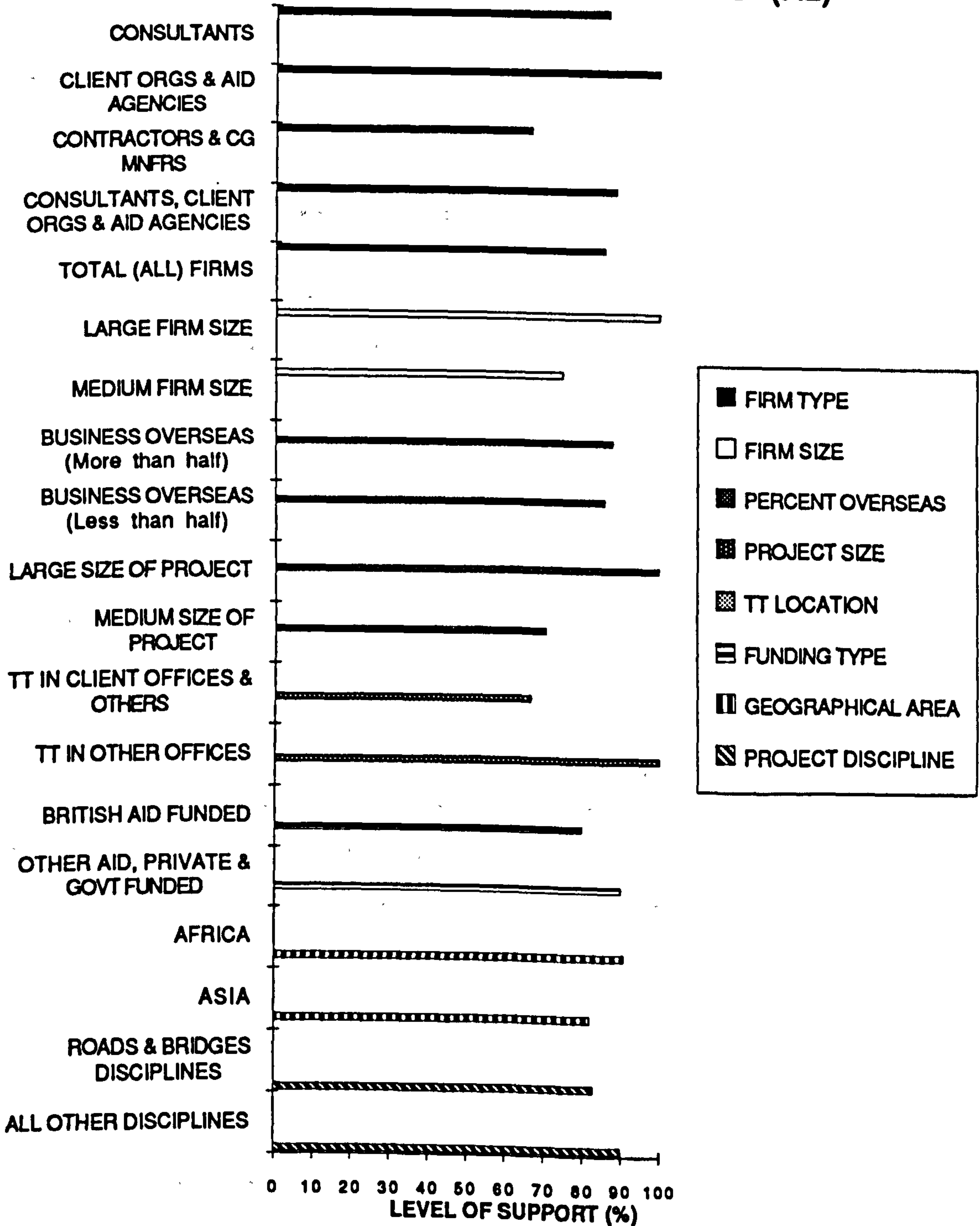
(Cases 1 to 12 only)



Source : Author's Interviews

FIGURE 8-18

LEVEL OF SUPPORT FOR HYPOTHESIS (A2)



Source : Author's Interviews

FIGURE 8-19

FULLY INTEGRATED JOINT VENTURES ON IT PROJECTS

Advantages

- CLOSER COOPERATION POSSIBLE FOR ALL PARTIES**
- STRONG COMMITMENT TO VENTURE'S OVERALL OBJECTIVES**
- LEAD PARTY FREE TO BEAR RESPONSIBILITY**
- LESS INTER-RIVALRY BETWEEN PARTIES**
- VENTURE ABLE TO EXERCISE FULL AUTHORITY**

Disadvantages

- REPUTATION OF EACH OF PARTIES LIMITED TO LIFE OF VENTURE**
- PARTIES UNABLE TO LINK BACK TO HOME FIRM RESOURCES**
- LEAD PARTY BEARS COST OF RUNNING VENTURE**
- EACH PARTY RESTRICTED IN WORKING TO OWN SYSTEMS**

Source : Author's Interviews

TABLE 8-20

LEVEL OF SUPPORT FOR HYPOTHESIS (A3a)

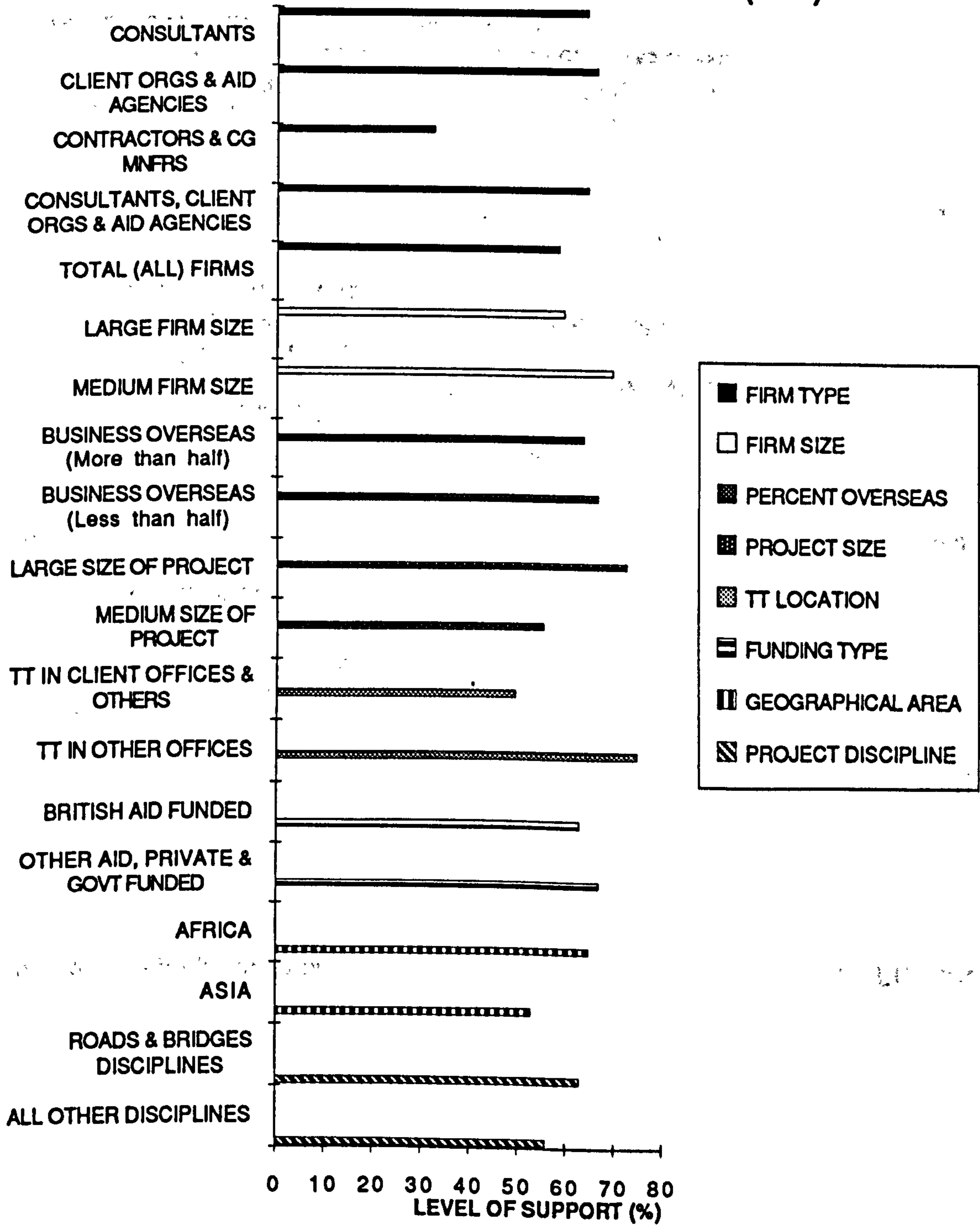


FIGURE 8-20

IMPORTANCE OF SUBSIDIARY OFFICES FOR OBTAINING TT PROJECTS

Important **39%**

VERY CRITICAL AND PART OF FIRM'S POLICY
 GLOBAL NETWORK OF OFFICES A NECESSARY SELLING POINT
 INDICATION OF A FIRM'S LOCAL COMMITMENT TO COUNTRY
 FIRM REGARDED AS LOCAL FIRM WITH STRONG ROOTS

Less Important **33%**

LESS IMPORTANT THAN PAST
 MARKET DEVELOPMENT REPORTS FROM SOME OFFICES
 OFFICE NEEDED IN MIDDLE EAST; NOT IN ASIA
 RESIDENT INDIVIDUAL COMMITTED TO COUNTRY KEY FACTOR
 ASSISTANCE IN WINNING WORK
 OFFICE FOR UP TO 2 YEARS ONLY (IF NO WORK)

Not Important **28%**

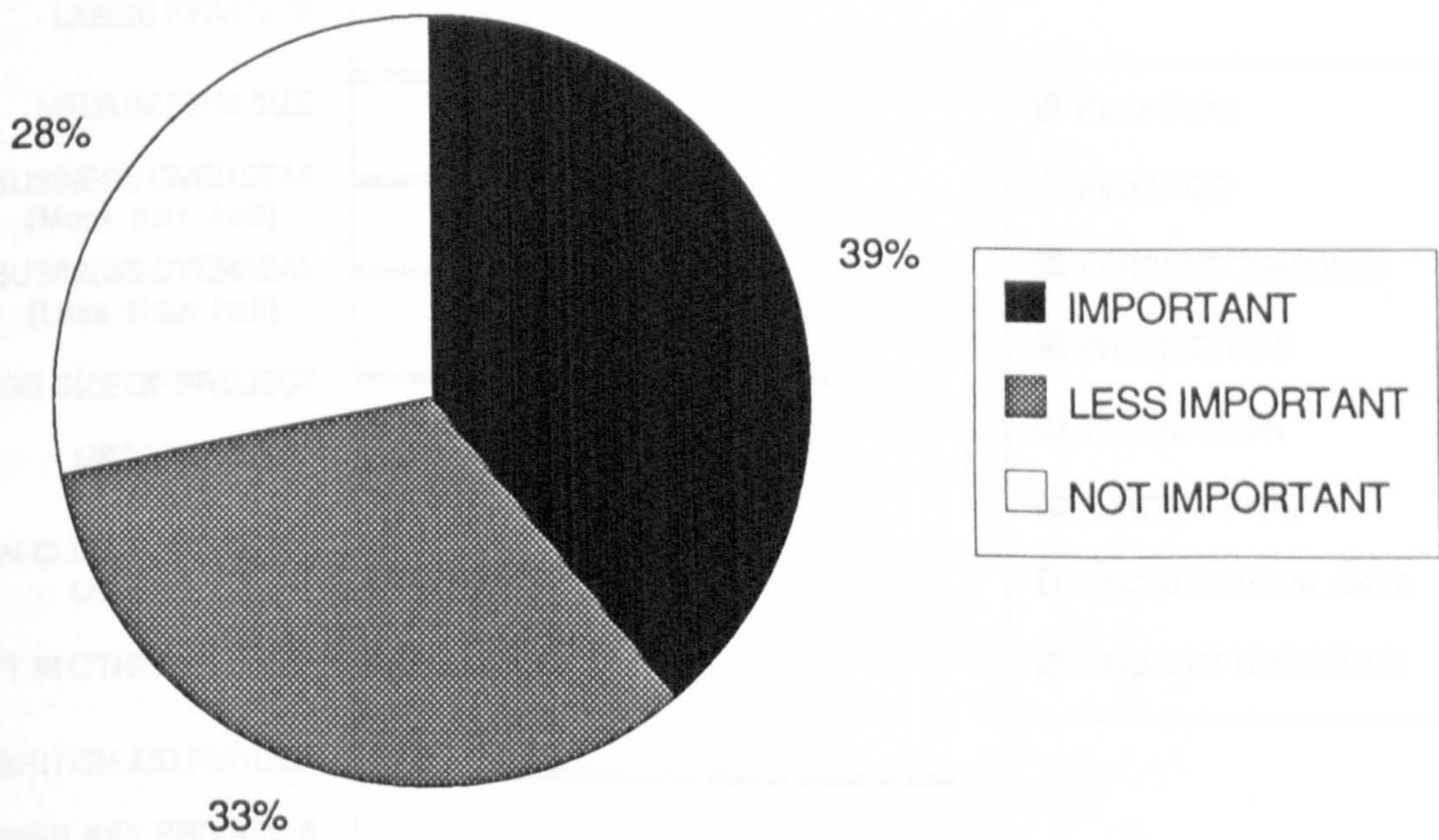
NO NEED FOR OFFICES
 EXPANSIVE TO OPERATE
 EASIER TO WORK OUT OF CLIENT OFFICES
 NOT NECESSARY FOR FIRST PROJECT
 AGENTS' OFFICES SUFFICE

TOTAL **100%**

Source : Author's Interviews

TABLE 8-21

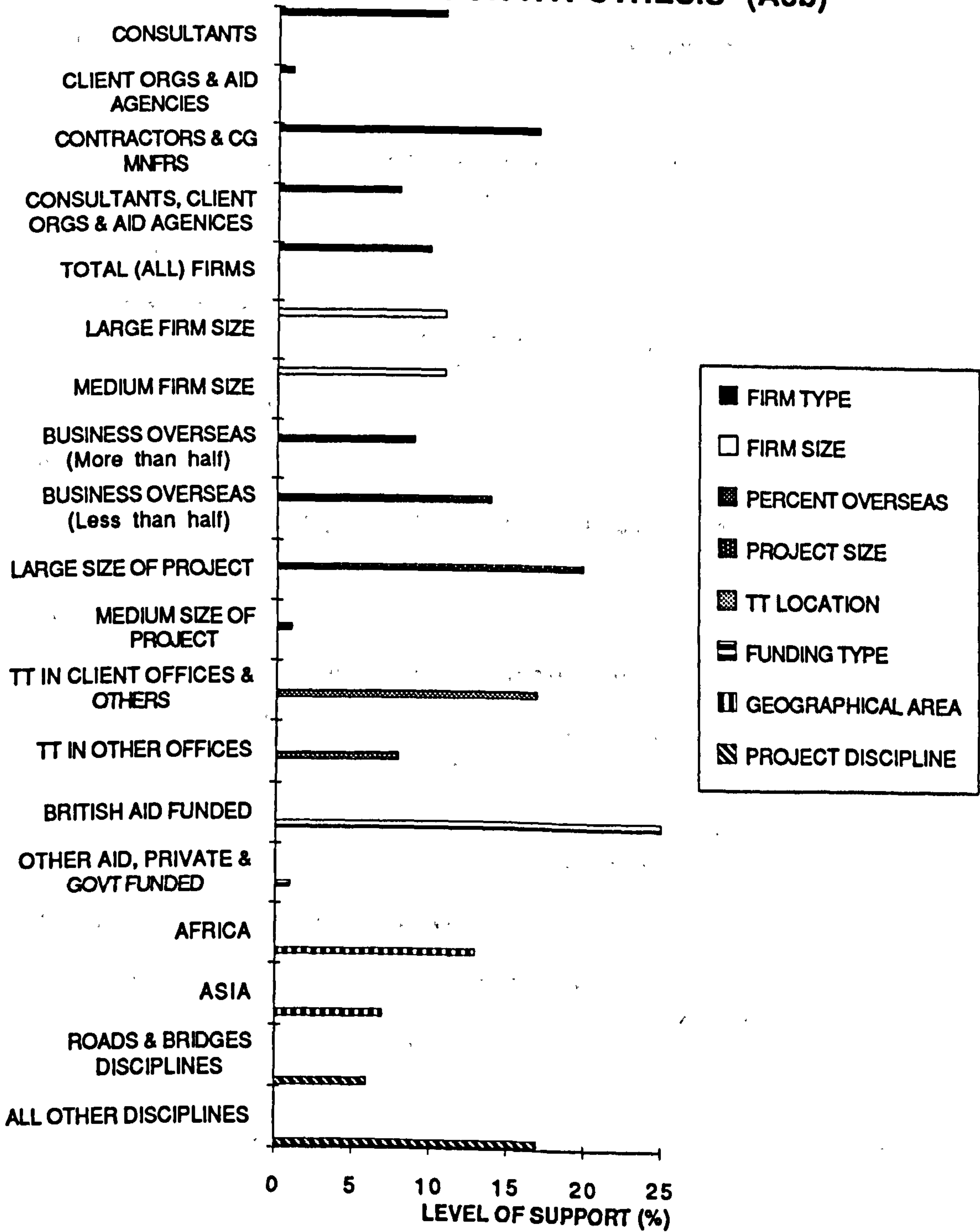
IMPORTANCE OF SUBSIDIARY OFFICES IN OBTAINING TECHNOLOGY TRANSFER PROJECTS



Source : Author's Interviews

FIGURE 8-21

LEVEL OF SUPPORT FOR HYPOTHESIS (A3b)



Source : Author's Interviews

Figure 8-22

MERITS OF DIFFERENT LOCATIONS TO CONDUCT TT

Subsidiary Offices

GOOD ACCESS TO LABOUR & WORK ETHIC
SPREAD OF TECHNICAL SOLUTIONS BETWEEN COUNTRIES
TAPPING STAFF AVAILABILITY ACROSS OFFICES

PROVISION OF AFTER SALES SERVICE IF HIGH DEMAND (Suppliers)

Local Consultants Offices

LOW TECH WORK DONE AT LOWER COST THAN HOME OFFICE
SEMI-EQUIVALENT TO OWN SUBSIDIARY OFFICE

Client Offices

TT MORE FORMALLY ORGANISED
IDENTIFICATION OF CLIENTS' PROBLEMS AT FIRST HAND
SENIOR LOCAL STAFF RECEIVE TT SUITED TO OWN SITUATION
PREFERENCE FOR ADVISORY OR EXECUTIVE ROLE

Project Offices

TT MORE APPROPRIATE CLOSE TO CONSTRUCTION ENVIRONMENT (6)
MEGA-PROJECTS PERMIT MID-TECH TT INPUTS

Home Offices

SUITED TO MIDDLE SENIORITY STAFF & BELOW FOR LONG PERIODS
WIDER EXPERIENCE OF LARGE WORLDWIDE PROJECTS
LEARNING TO OPERATE IN DIFFERENT MANAGERIAL CULTURE
HOST COUNTRY PERSONNEL "EXPAND HORIZONS"
AVAILABILITY OF TOTAL COMPUTING FACILITY
ACCESS TO CONCENTRATED RESOURCES OF STAFF KNOW-HOW
EXPOSURE TO WIDER USE OF CONSTRUCTION MATERIALS

University and College Courses

BUDGETTED PROVISION FOR COURSES AVAILABLE
TECHNICAL AND BUSINESS CONTENT OF COURSES NOT SOLE VALUE
COURSES REQUIRE MATCHING TO PERSONNEL ABILITIES
POOR TIMING DISRUPTIVE TO OPERATIONAL PROJECT TT

Source : Author's Interviews

TABLE 8-22

8.6 LONG TERM IMPLICATIONS : DISCUSSION

M1a "Technology transfer is a long term business phenomenon rather than a short term one".

For consultants this was strongly supported (90%).(see Figure 8-23) Most of those who had been in receipt of TT from consultant firms had returned to their own client organisations; a smaller number had left to set up their own local consultancies or joined aid agencies as advisers in a few cases (see Table 8-23). Business often flowed back to the firms from these contacts of earlier years. Many of the host country personnel had risen to positions of prominence in a period of 5 to 10 years. The genuine friendships and relationships established in the past were of clear benefit to these firms where this had occurred.

Apart from these live contacts, the firm itself was strengthened in a long term way. (see Table 8-23 and Figure 8-24). Single relationships with clients occurred "time and again". Some aid projects were also proceeding on a continuing renewal basis. Clients' staff who had been in receipt of TT in home offices were convinced in a deep way of the merits of the firm and returned home allegedly extolling its virtues. One firm saw TT as leading to the stronger establishment of its local subsidiary offices, which were expected to grow in number. Another could convince the client of its humanitarian aims as against the attitude of some competitors who had a poor reputation for trying to "make quick money".

Self sufficiency was being achieved most in Asia, in such countries as Malaysia, Indonesia and Korea, and least in Africa; Central Asian countries came somewhere in-between. The need for TT seemed to be perpetuated however, in many of the countries where the firms worked. A variety of reasons were given both internal to the firm and external (see Table 8-23). In the former, senior staff moved on to other work, either out of the post, to another country or even to the World Bank. There was also a lack of a proper reward system operating for many of those who undertook TT. Organisational promotion was not carried out in practice often enough and TT was not followed through to its logical conclusion by heads of client bodies. Even where promotion did occur there was usually no staff structure in place below these positions, for adequate technical and project management. The

threat from the private sector was slow to materialise in many countries since local firms usually set their sights on low tech work.

In the external context wider issues kept consultants' services in demand. Many countries had poor local economies, exacerbated by a fast birth rate, plus an undeveloped higher education sector. This in turn led to an insufficient reservoir of capability to master the skills of consulting which were rarely learned inside 10 or 15 years. Graft and corruption were an underlying malaise in many regions.

On the other hand many (negative) factors conspired to reduce consultants' long term influence (see Table 8-23). The British government had been seen to be cutting British Council and BBC World radio budgets, in spite of their highly regarded positive influence. In another area, second world personnel were beginning to offer their services to third world countries and the concern was that they would win more work on the grounds of their appropriateness, although their motivation and efficiency was sometimes lacking. Sweeping changes in governments could also sweep with them key decision makers who had worked with consultant firms in the past. Even if a client still went on asking for a consultant's services, aid agencies might withdraw their support for the firm itself. In any event, some regions were not the most appealing due to slackening demand, deteriorating diplomatic relations or social conditions.

For the different headings of consultants there was fairly consistent support for TT being a long term phenomenon. Those firms who were less internationalised (100%) saw more benefit than those who already had more overseas projects (82%). This possibly meant that consultants who were fully involved overseas had some misgivings over the long term benefit to them. Those working on the medium sized projects (100%) were similarly more convinced on the long term value of TT than those who conducted larger projects (82%). This was probably because the medium sized projects would be more likely to re-occur in a country than the larger project. Those who were located in client offices for TT saw more long term attractions (100%) than those who were not (83%). There was little difference between British aided projects (88%) and other funded projects (92%).

Client organisations and aid agencies (50%) were undecided as to whether TT was really of long term benefit to firms. Perhaps being aware of the overall objectives

of TT for host countries, this overshadowed their prediction of any long term value of TT for the firms themselves.

For contractor and suppliers any long term benefit from TT was significantly unsupported (33%). This fitted in with a view that contractors were less prepared to wait around in countries in the hopes of projects materialising, which affected their desire to interrelate with the client in a long term way anyway. Suppliers similarly were not so closely linked to the client, unless they took the lead in a turnkey project; this, as a form of involvement, was usually intermittent rather than continuous.

For all firms overall, there was support (72%) for a long term view of TT. Interestingly there was no noticeable difference, here, between Africa and Asia although roads and bridges projects (82%) were seen to have more long term benefit for firms than other disciplines (60%).

M1b "Technology transfer is profitable financially, in the short term".

For consultants this was unsupported (47%). (see Figure 8-25) While "boot" projects were seen as more profitable, few consultants, as was made clear in Table 8-19 and Figure 8-18 could afford to be involved much in them; they also tended to eclipse the TT process itself. On TT projects profitability had to be watched; TT was closely aligned to public relations and hard to sell at the price it was worth; ironically, it often increased the price of a package. If managed properly it could bring profit, particularly if project budgets specifically allowed for TT work. Domestic UK projects were currently, in many cases, more lucrative and the supplying of experts, on an aided project, had a fixed rate limit, which meant lower margins than on straightforward design. Costs could none the less be recovered since TT work was on a time-charged basis. TT was not a high earner but from an aid agency's view, consultants were not expected to lose on secondments of host country staff to their home offices.

Just as consultants took a long term view of TT and saw many advantages, there were a further set of parallel advantages in the short term for them (Table 8-24 and Figure 8-26). A minority of consultants were carrying out TT because of a

requirement being forced upon them by the client or agency, or because of the knowledge that competitors would step in and undertake TT if they did not.

More positively TT was seen as providing assistance in both bidding and shortlisting. It enabled senior client decision makers to be influenced, achieving access at the highest seat of government in some cases. As a soft marketing mechanism, it allowed the firm to enhance its reputation and credibility. Client contact was increased; more guidance was possible and there was less arms-length dealing; instead the full participation of the client could be obtained. Misunderstandings invariably arose but through TT these could often be ironed out. From the other side, a client was able to assess its consultants' capabilities at close quarters.

The whole TT process facilitated the traditional work of some firms and allowed a better job to be carried out. Where language was a difficulty in some countries, TT projects overcame these barriers more readily. Firms derived added benefits in being able to understand their clients' problems better so that more adequate proposals could be written than would otherwise have been possible. On occasions, firms also found themselves recruiting third world personnel who proved useful to them on later projects, particularly where language or appropriateness was a key issue. Contractors also took on board competent host country individuals who had proved themselves able to work within the type of management structure, usually operated by developed country contractor firms overseas.

For the different headings of consultants, medium sized firms saw greater advantage (60%) in the short term from TT than the larger firms (38%). Those firms who were less internationalised also perceived greater benefit (62%) in the short term possibly because they considered they could more easily cover their costs than the more internationalised firms (36%). Those who carried out medium sized projects (89%) saw very much greater reward in TT in the short term than those conducting larger projects (10%). This may have been because the scale of larger projects eclipsed the TT aspect of the project or that TT had the potential to disrupt the productive flow of project work. There was a similar disparity between those who were located in client offices seeing more short term benefit in TT (75%) than those who did not work there (27%), which was most probably explained by the lower overheads made possible for firms in the former group. British aided

projects (57%) seemed to be marginally profitable in the short term whereas other funded projects (42%) were not.

Client organisations and aid agencies viewed short term profitability (50%) slightly more optimistically than consultants (47%). The general view of aid agencies seemed to be that firms should at least break even or cover their costs on TT projects.

Contractors and suppliers were even less enthusiastic about TT's profitability (25%). In fact they saw it as a loss unless agencies specifically provided for this work in the project budget; where they did, in a specific manner, it could be profitable as long as the rhythm of a project was not disrupted.

For all firms overall, TT was not seen as being profitable (42%) in the short term. Asia (50%) was on the margin of profitability whereas Africa (40%) was not. It seemed to be far easier to achieve profitability on roads and bridges projects (60%) in the short term than on other disciplines (25%).

M 2 "Technology transfer facilitates the gathering of market intelligence information".

For consultants this was strongly proven (75%).(see Figure 8-27) The chances of such information being made available was increased due to a greater informality and personal interaction on TT work. It was easier to call on decision makers because firms already had a good reason for being in their offices. This also cut out the need for expenditure on separate expensive visits, which were sometimes hard to time correctly.

For the different headings of consultants, larger firms (80%) considered that market intelligence information could be gathered satisfactorily and this was also supported by the medium sized firms (70%). There was a similar pattern for the more internationalised firms (82%) and those less internationalised firms (67%). This suggested that both the larger firms and those who were well internationalised were well aware of the value of gathering information on TT projects. Medium sized projects (78%) seemed to be slightly more advantageous for doing this than larger projects (73%) but both proved useful. Firms who were

located in client offices (75%) saw much value in TT projects for market information gathering and this view was similarly shared by those who conducted TT elsewhere (75%). British aided projects and other funded projects were also similarly valued for gathering upcoming information.

For client organisations and aid agencies there seemed to be a strong awareness that the TT process afforded firms a genuine opportunity (100%) to gather information on new work, although consultants themselves felt this a little less keenly (75%).

There was less support from contractors and suppliers (67%) for the idea of market intelligence gathering during the TT project process, because of the management level at which TT was pitched. Information was more likely to come during other visits of the firm's various divisions when they called on prospective client decision makers as part of their normal work.

For all firms overall, Asia (86%) was found to be a more fruitful place to gather market information, on TT projects, than Africa (71%). Similarly roads and bridges projects (88%) were better for firms than those of other disciplines (57%).

M3 "Technology transfer enhances opportunities for market penetration and market development".

For consultants this was strongly supported (74%). (see Figure 8-28) Market penetration and development occurred via aid projects, sometimes where funding for new countries was already in preparation; these were often the markets which firms were trying to enter, an important factor in their success being their current track record in the region or elsewhere (Table 8-25). Firms also put TT proposals together with a client and then convinced aid agencies such as ODA, World Bank or EEC to act as sponsors. They were in essence the creators of TT packages which they then found to be a selling point with new clients. One example was a computerised maintenance system introduced into China; a second was a series of transnational seminars, bringing several South East Asian countries together to convince them of the need for electric power sharing. A third was the placing of a TT adviser in a host country University to help run courses in a technical discipline in which the firm was strong. Two of these projects were aid funded. In

spite of this, one firm regarded their overall project experience as being the major factor in breaking new ground and not TT as such. Another firm, however, had used its TT approach to gain incrementally larger commissions by tackling small amounts of work for clients in the first place. A third firm chose a "boot" approach for entering new markets by offering to finance the very largest projects. In such a context, TT was needed but, by comparison, it was of far less significance.

On a less positive note, firms had found it difficult to break away from a stereotyped reputation in some instances (Table 8-26). Certain clients regarded a firm as "their consultant" for one discipline (such as water) and there were difficulties in convincing them of their other multidisciplinary skills, which they were carrying out equally satisfactorily in other countries. Extensions from one country to another were usually assisted, most, by a convenient airline link and, least, by inter-rivalry and prejudices between neighbouring countries. Establishment of a new venture could not be dissociated from the personal qualities of the senior individual leading the firm's mission. Certain types of charisma seemed to work in some countries very effectively and were not necessarily suited to all regions.

For the different headings of consultants, medium sized firms (80%) saw more opportunity for market penetration and development from TT projects than larger firms (67%). This was probably because larger firms had established better networks, which they were already using. There was little difference noted between more internationalised firms and less internationalised. However both valued the opportunity presented by TT projects. Medium sized projects (89%) seemed better placed than larger projects (60%) possible because there was more client contact on these projects. (Larger projects tend to be quite self-contained, particularly in a foreign location where much back-up support is required from outside the country). For firms who located in client offices (71%) there was a similar regard for the opportunities of penetrating new markets, as for those not so located (75%). British aided projects also gave more opportunity (85%) for market penetration than those funded by other sponsors (67%).

For client organisations and aid agencies, there was unanimous support (100%) for the view that new markets could be penetrated through TT projects. This prospect was viewed less optimistically by consultants (74%). Perhaps the

latter's view, while still supportive, was tempered by the reality of actually bringing this to fruition.

For contractors and suppliers (40%) by contrast, the view of lateral expansion into new territory or markets through TT projects was unsupported, possibly because of the distance of the client from them in the contract chain, excepting those situations where they acted in the lead.

For all firms overall, there was support (73%) for the view that new markets could be accessed and opened up through TT. This was seen to be more possible in Asia (86%) than Africa (63%). For roads and bridges (88%) there were similarly more possibilities than with other disciplines (57%).

8.7 CONCLUDING SUMMARY

This chapter is best summed up by referring to the summary tables which list the different types of firm and situations when T T might occur. (see Tables 8-27, 8-28, 8-29 and 8-30 at the end of this chapter). These are listed under the four general headings describing the hypotheses. The range of support for each is shown along with an indication of "most" and "least" levels of such support. Under these subheadings it can be seen which groups and situations are involved. Further discussion follows under Policy Recommendations in Chapter 10.

LEVEL OF SUPPORT FOR HYPOTHESIS (M1a)

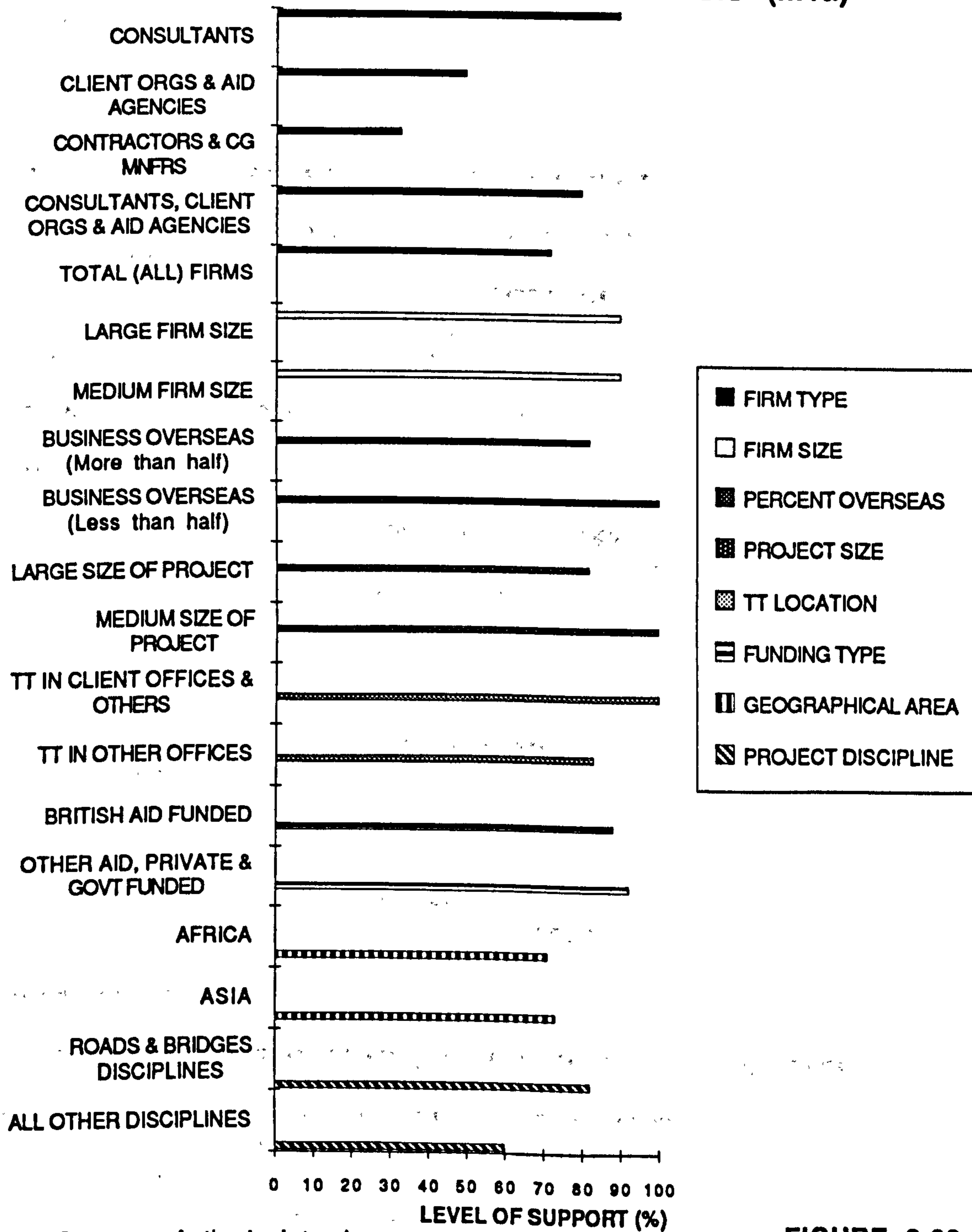


FIGURE 8-23

ATTRIBUTES OF TT IN THE LONG TERM **100%**

Positive [81%]

FORMER TT CONTACTS IN CLIENT AND OTHER ORGANISATIONS **33%**

LATER BUSINESS FLOWING BACK TO THE FIRM
CLIENT ORGANISATIONS SENIOR POSITIONS
GENUINE FRIENDSHIP ESTABLISHED
AID AGENCIES WB, ODA & ARAB
LOCAL CONSULTANT JOINT BID

FIRMS OWN BUSINESS STRENGTHENED IN LONG TERM **21%**

SINGLE RELATIONSHIPS WITH CLIENT TIME AND AGAIN
REGULAR REPEAT ORDER AID PROJECTS
CONVINCE CLIENTS TT STAFF OF MERITS OF FIRM
SUCCESSION OF LOCAL OFFICES MULTIPLYING
HUMANITARIAN NON-MERCENARY APPROACH

PERPETUATION OF CLIENT NEED FOR TT **33%**

INTERNAL

SENIOR STAFF IN CLIENT MOVE ON TO OTHER WORK
LACK OF REWARD STRUCTURE FOR TT IN CLIENT ORGANISATION
LACK OF CLIENT STRUCTURE FOR TECH. & MNGMNT. WORK
LOCAL FIRMS SET SIGHTS ON LOW TECH WORK

EXTERNAL

LOW WORLD MARKET PRICES FOR PRODUCTS
INSUFFICIENT RESERVOIR OF PEOPLE
FAST BIRTH RATE
CORRUPTION & GRAFT
POOR LOCAL ECONOMY
HIGHER EDUCATION SECTOR UNDEVELOPED
CONSULTING BUSINESS 10 TO 15 YEARS TO LEARN

Negative [19%]

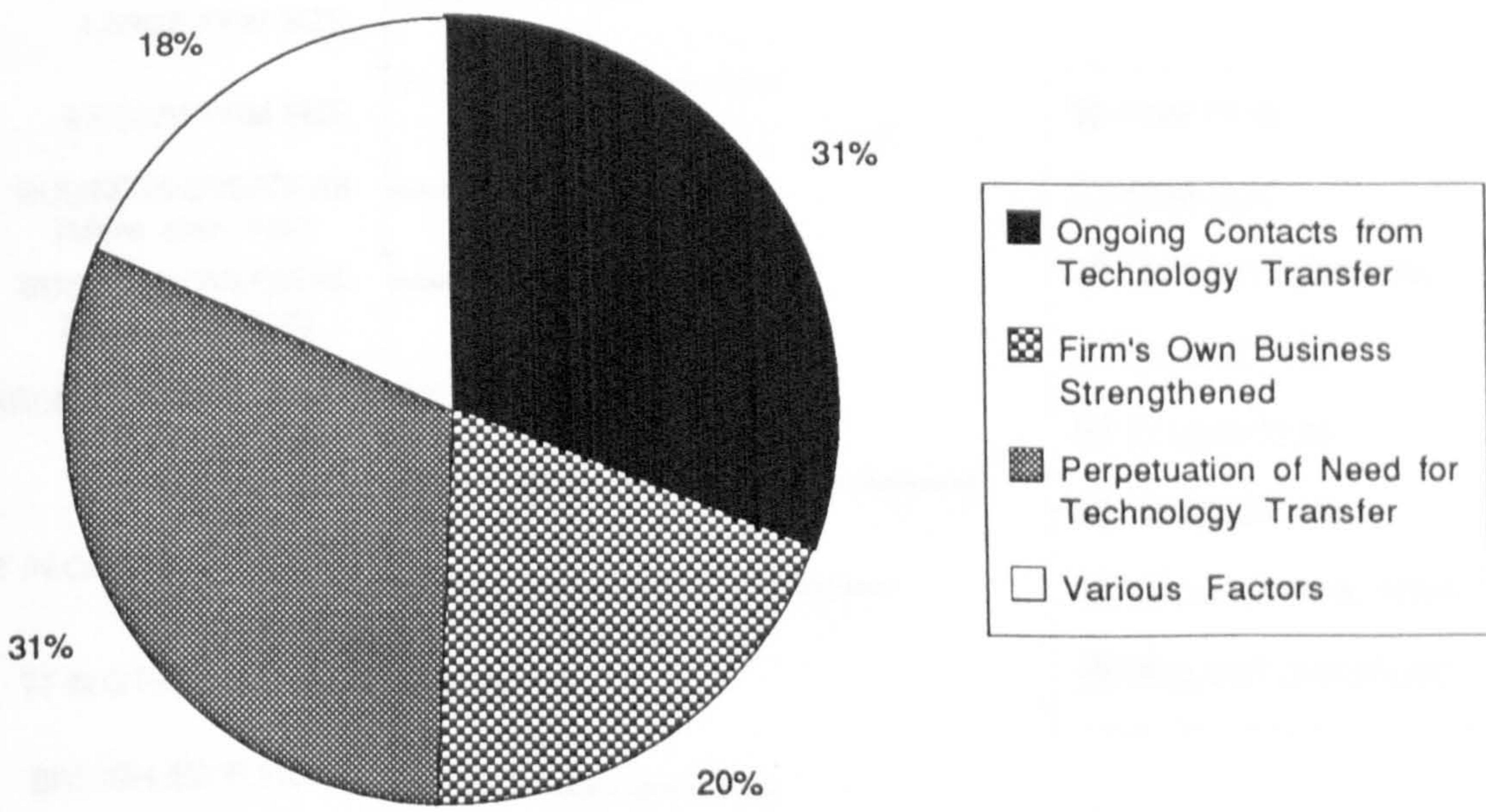
FACTORS UNDERMINING CONSULTANTS PRESENCE IN LONG TERM **14%**

SUDDEN CHANGE OF GOVERNMENT & DECISION MAKERS
CONSULTANT BEING USED AS DESIGN CONTRACTOR
BRITISH COUNCIL & BBC WORLD SERVICE CUTBACKS
SECOND WORLD PERSONNEL CLOSER TO THIRD WORLD
INSUFFICIENT PROFESSIONAL INDEMNITY COVER IN RISKY COUNTRIES
POOR DIPLOMATIC & SOCIAL CONDITIONS IN CERTAIN REGIONS
FAILURE TO SATISFY BOTH AID AGENCY AND CLIENT
UNSUSTAINED LEVEL OF DEMAND (Some countries)
RELUCTANT CLIENTS FOLLOWING FORMER TT CONTRACTS

Source : Author's Interviews

TABLE 8-23

SUMMARY OF LONG TERM ATTRIBUTES FOR TECHNOLOGY TRANSFER

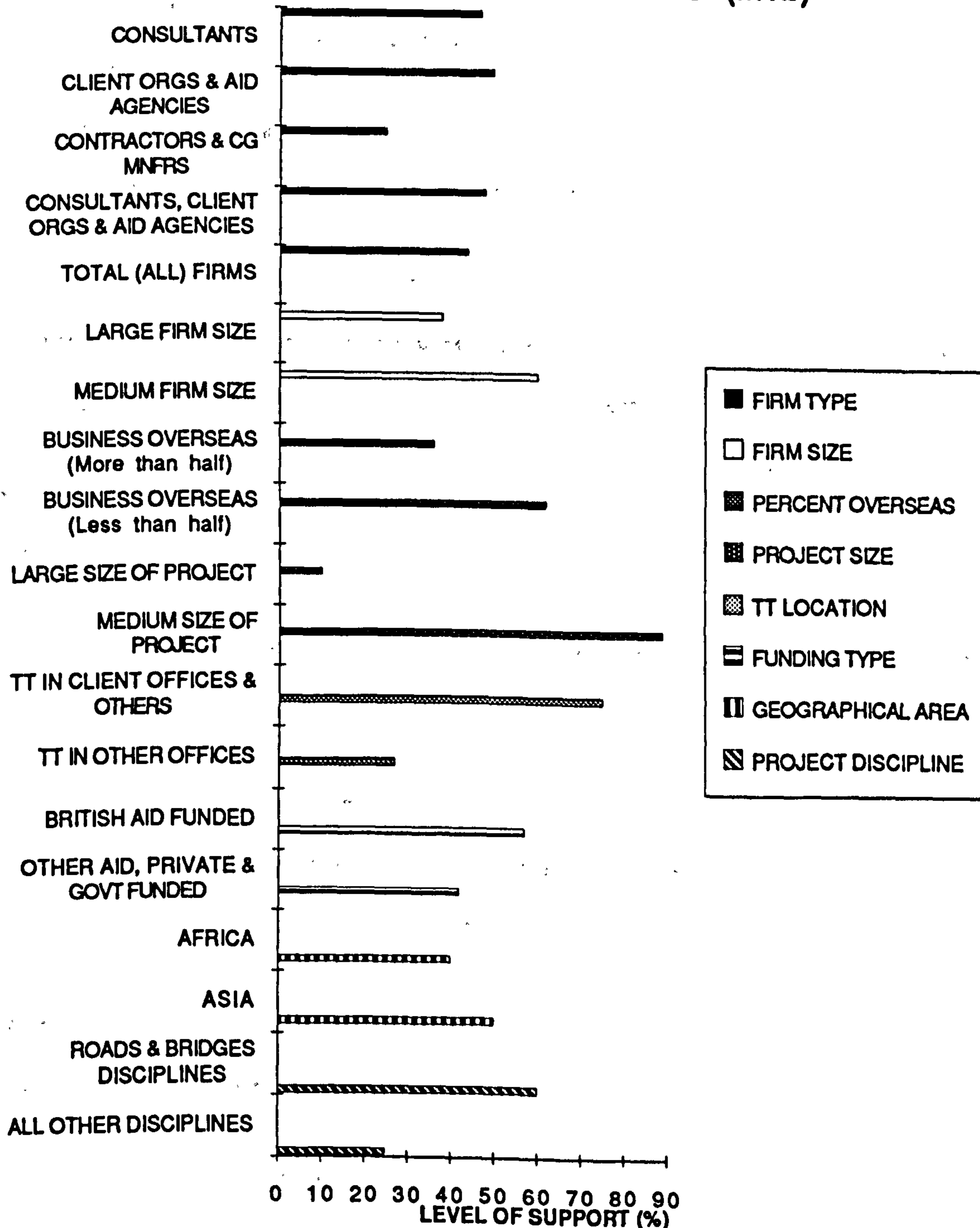


Advantages (Shaded) 82%
Disadvantages 18%

Source: Author's Interviews

FIGURE 8-24

LEVEL OF SUPPORT FOR HYPOTHESIS (M1b)



Source : Author's Interviews

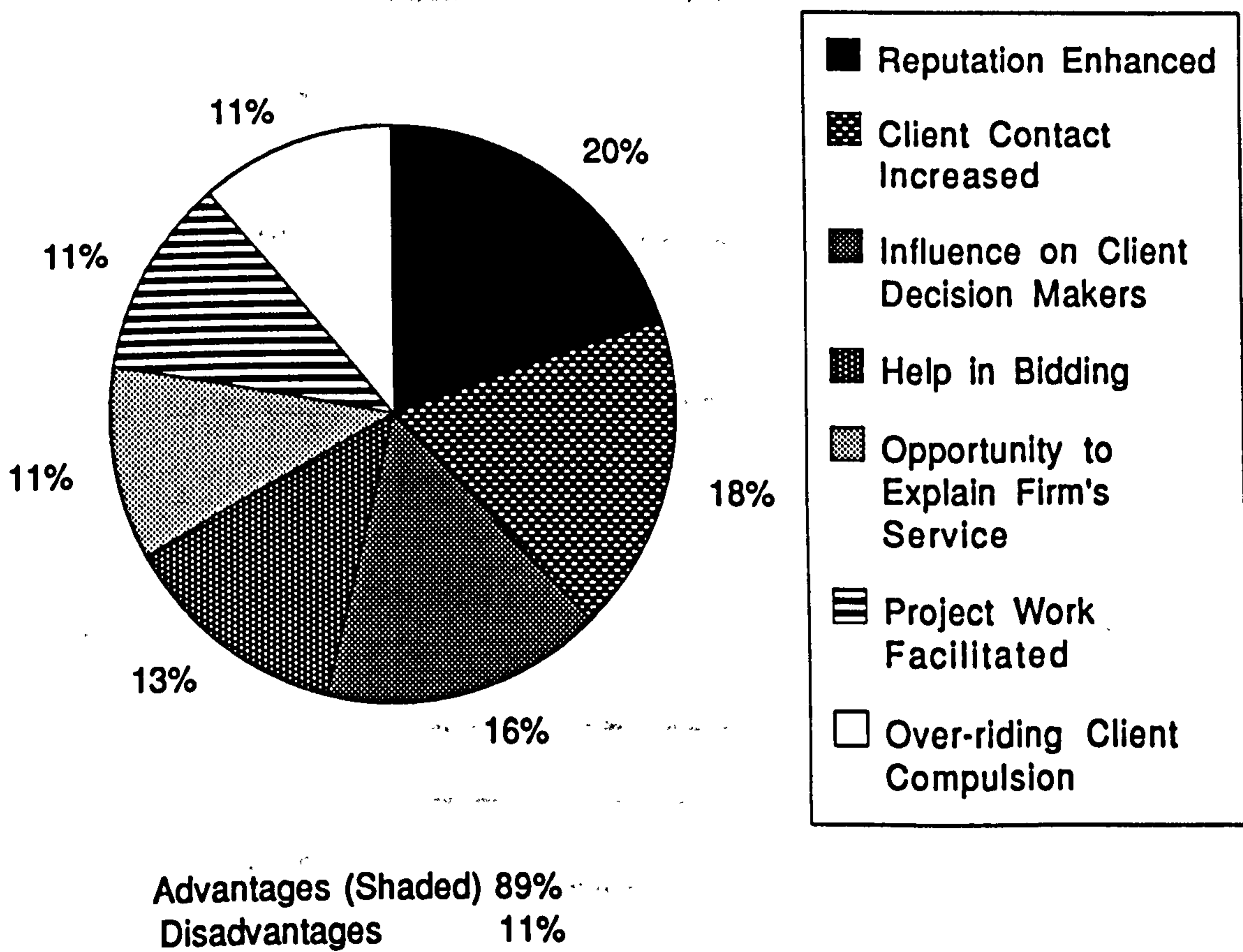
FIGURE 8-25

ATTRIBUTES OF TT IN SHORT TERM	100%
Positive [89%]	
REPUTATION ENHANCED	20%
CREDIBILITY INCREASED SEEN AS CONTRIBUTING TO DEVELOPMENT "QUICK MONEY" IMPRESSION REMOVED	
CLIENT CONTACT INCREASED	18%
NOT "ARMS LENGTH" BUT FULL CLIENT PARTICIPATION BETTER INTERACTION MORE GUIDANCE POSSIBLE FAVOURED SINGLE RELATIONSHIP	
INFLUENCE ON CLIENT DECISION MAKERS	16%
ACCESS TO SENIOR LEVELS OF CLIENT GOVERNMENT SOFT MARKETING	
HELP IN BIDDING	13%
ADVANTAGE IN SHORT LISTING MORE "POINTS" FOR PROPOSALS	
OPPORTUNITY TO EXPLAIN CONSULTANTS SERVICE	11%
LESSEN MISUNDERSTANDINGS BY EXPLANATION CLIENT ASSESS FIRMS CAPABILITIES BETTER	
PROJECT WORK FACILITATED	11%
CARRY OUT TRADITIONAL FUNCTION MORE THOROUGHLY OVERCOME LANGUAGE BARRIERS APPRECIATE CLIENTS PROBLEMS BETTER RECRUIT COMPETENT HOST COUNTRY PERSONNEL	
Negative [11%]	
OVER-RIDING COMPULSION	11%
INESCAPABLY LINKED TO PROJECT COMPETTORS OFFERING INSTEAD	

Source : Author's Interviews

TABLE 8-24

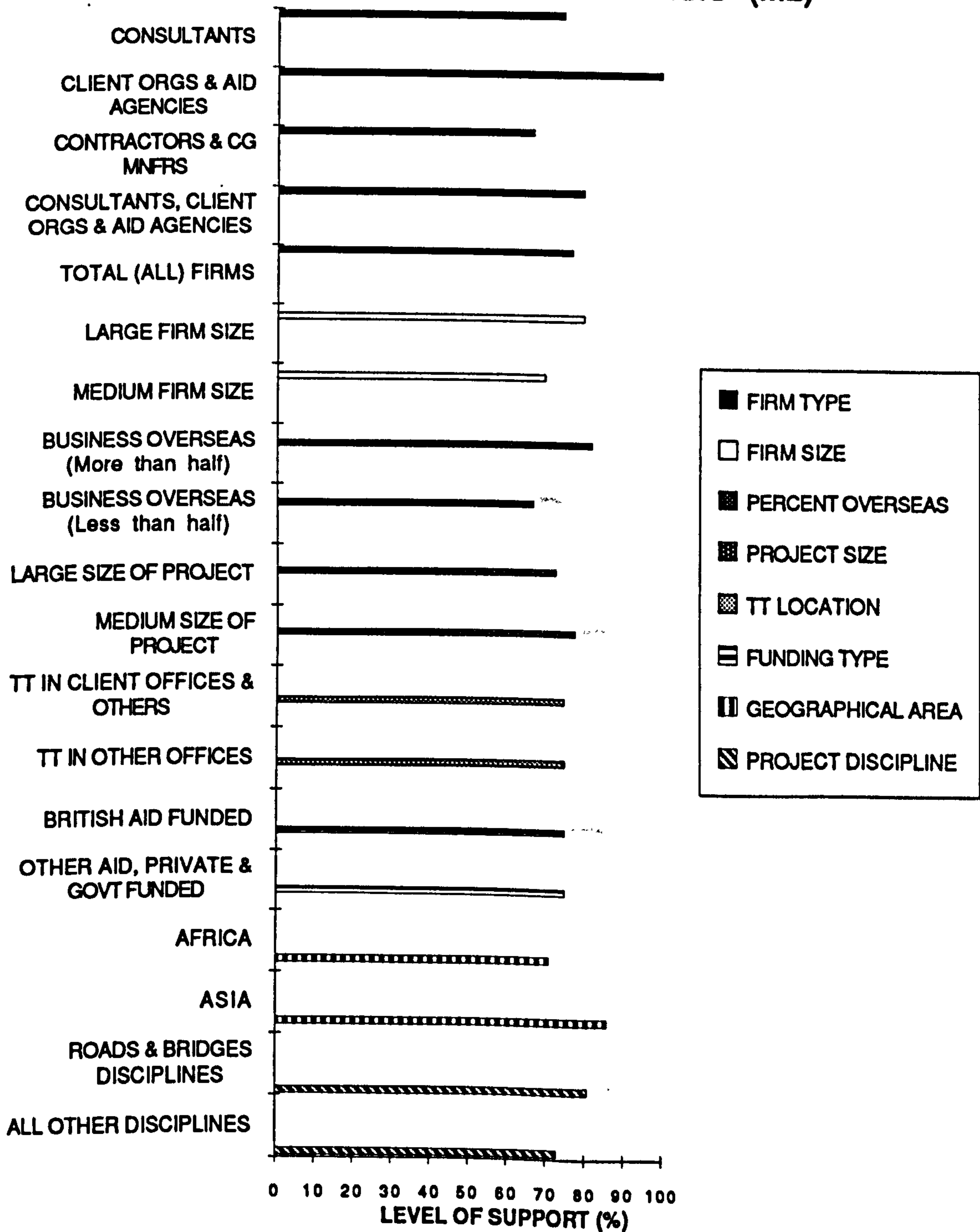
SUMMARY OF SHORT TERM ATTRIBUTES FOR TECHNOLOGY TRANSFER



Source : Author's Interviews

FIGURE 8-26

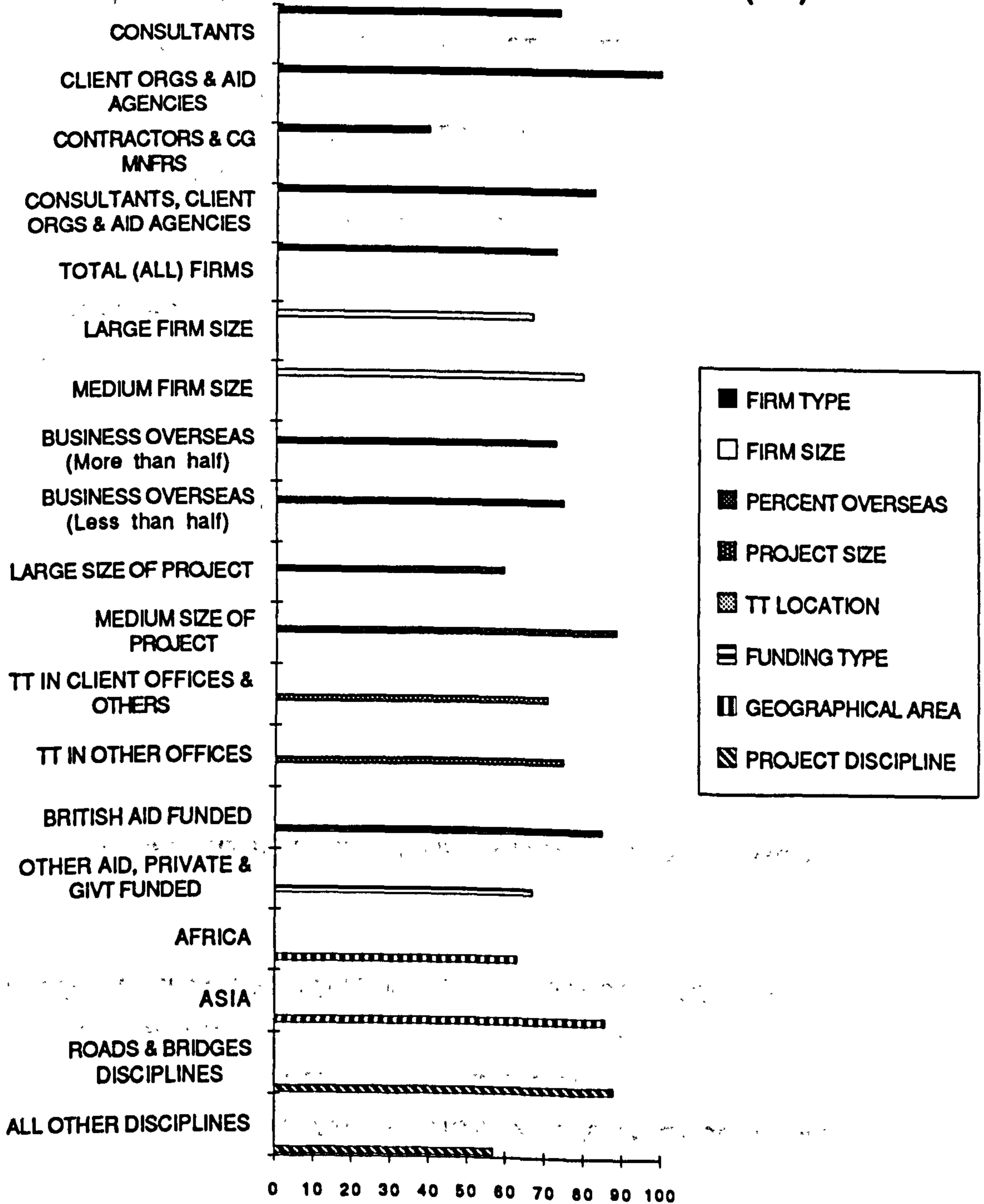
LEVEL OF SUPPORT FOR HYPOTHESIS (M2)



Source : Author's Interview

FIGURE 8-27

LEVEL OF SUPPORT FOR HYPOTHESIS (M3)



Source : Author's Interviews

FIGURE 8-28

INSTANCES OF MARKET PENETRATION & DEVELOPMENT

CURRENT TRACK RECORD IN REGION
ARRANGEMENT OF FINANCE
GRADUAL EXPANSION TO LARGER PROJECTS via TT
OVERALL EXPERIENCE not TT
CREATION OF AID TT PACKAGES (ODA, WB, EEC)
TRANSNATIONAL SEMINARS
COMPUTERISED MAINTENANCE SYSTEMS
ALREADY FUNDED AID PROJECTS
TT PACKAGES A SELLING POINT
BOOT PROJECTS

Source : Author's Interviews

TABLE 8-25

HINDRANCES TO MARKET PENETRATION & DEVELOPMENT

STRONG REPUTATION IN ONE DISCIPLINE STEREOTYPING FIRM
RIVALRIES AND PREJUDICES BETWEEN COUNTRIES
INSUFFICIENT HIGH PROFILE REPRESENTATION
CONVENIENT AIRLINE COMMUNICATION LINKS BETWEEN COUNTRIES

Source : Author's Interviews

TABLE 8-26

SUMMARY OF FINDINGS : NATURE AND EXTENT OF TECHNOLOGY TRANSFER

**T T INVOLVES MORE MANAGEMENT KNOW-HOW (N1)
(SUPPORTED 94%)**

Most Support from client organisations and aid agencies, and medium sized consulting firms who were less internationalised located in client offices working on other funded projects in Asia (100%).

Least support from contractors and suppliers (83%).

**T T IS MANDATORY (N2a)
(Unsupported 41%)**

Most support from contractors and suppliers (100%).

Least support from less internationalised consulting firms located in client offices (11-38%).

**T T IS ENCOURAGED MORE BY AID AGENCIES (N2b)
(Unsupported 41%)**

Most support from client organisations and aid agencies (67%).

Least support from medium sized firms located in client offices (10-13%).

**CLIENTS ARE NOT CLEAR AS TO T T REQUIREMENTS (N3)
(Supported 59%)**

Most Support from consulting firms on British aided, roads and bridges projects (75-76%).

Least Support from contractors and suppliers, and consulting firms working on "other" funded and "other" discipline projects in Africa (50-53%).

Source : Author's Interviews

TABLE 8-27

SUMMARY OF FINDINGS : TYPES OF PROJECT AND FIRM

DEPTH OF CLIENT RELATIONSHIP RELATED TO TYPE OF PROJECT (T1)

(Supported 80%)

Most Support from client organisations and aid agencies, and contractors and suppliers (100%).

Least Support from less internationalised consulting firms (57%).

T T REQUIRES STRONG SERVICE ORIENTATION (T2)

(Supported 61%)

Most Support from large size consulting firms with medium sized projects, and from client organisation and aid agencies (78-80%).

Least Support from contractors and supplier (33%).

T T HAS TO BE MAINSTREAM EXPERTISE (T3)

(Supported 93%)

Most Support from contractors and suppliers, and medium sized less internationalised consulting firms with large projects located in client offices on British aided projects (100%).

Least Support from client organisations and aid agencies (80%).

MEDIUM SIZED FIRM CONDUCT T T BETTER (T4)

(Unsupported 32%)

Most Support from client organisations and aid agencies and Consulting firms located in client offices (67%).

Least Support from Contractors and suppliers, and consulting firms not located in client offices on "other" discipline projects in Africa (0-18%).

Source : Author's Interviews

TABLE 8-28

SUMMARY OF FINDINGS : COOPERATIVE ARRANGEMENTS

JOINT VENTURES AND CONSORTIA ARE INVOLVED IN T T (A1)

(Supported 63%)

Most Support from more internationalised consulting firms (82%).

Least Support from less internationalised consulting firms (33%).

INTEGRATED JOINT VENTURES ARE NEEDED ON T T (A 2)

(Supported 86%)

Most Support from large sized consulting firms with large sized projects not located in client offices (100%).

Least Support from contractors and suppliers, and medium sized consulting firms located in client offices with medium sized projects (67%).

SUBSIDIARY OFFICES ARE NECESSARY TO OBTAIN T T (A3a)

(Supported 59%)

Most Support from large sized consulting firms with large size of projects not located in client offices (70-75%).

Least Support from contractors and suppliers (38%).

SUBSIDIARY OFFICES ARE NEEDED TO CONDUCT T T (A3b)

(Unsupported 10%)

Most Support from consulting firms with large sized projects and British aided funding (20-25%).

Least Support from client and aid agencies, and consulting firms with medium sized projects with "other" funding (0%).

Source : Author's Interviews

TABLE 8-29

SUMMARY OF FINDINGS : LONG TERM IMPLICATIONS

T T HAS LONG TERM BENEFIT (M1a)

(Supported 72%)

Most Support from less internationalised consulting firms with medium sized projects located in client offices (100%).

Least Support from contractors and suppliers, and client organisations and aid agencies (33-50%).

T T HAS SHORT TERM BENEFIT (M1b)

(Unsupported 44%)

Most Support from consulting firms with medium sized projects located in client offices (75-89%).

Least Support from contractors and suppliers, and consulting firms with large projects not located in client offices on "other" discipline projects (10-27%).

MARKETING INFORMATION GATHERING WITH T T (M2)

(Supported 77%)

Most Support from client organisations and aid agencies, and from consulting firms working in Asia (86-100%).

Least Support from contractors and suppliers and less internationalised consulting firms (67%).

MARKET PENETRATION AND DEVELOPMENT WITH T T (M3)

(Supported 73%)

Most Supported from client organisations and aid agencies, and consulting firms with medium sized projects in roads and bridges disciplines on British aided projects (85-100%).

Least Support from contractors and suppliers, and consulting firms with large sized projects (40%).

Source : Author's Interviews

TABLE 8-30

CHAPTER 9

CONTRIBUTIONS TO LITERATURE

9.0 SUMMARY OF CHAPTER 9

1. The literature reviewed in the first part of the thesis is evaluated using the contribution of the case studies and their subsequent analysis.
2. Following the eclectic theory a further set of advantages and disadvantages emerge for construction consultants; these centre on ownership internalisation and location etc.
3. Rigidity was observed in some of the larger consultants' organisations; there was some evidence of information being consolidated across international offices.
4. Some consultants worked from a global platform. Many adopted country or regionally centred strategies. Some consultants were aware that their clients placed a higher value on technology transfer than they themselves would have ascribed to it. Differentiation through focus could occur.
5. Firms found that T T projects made them adapt the structure of their organisations. Through such projects greater closeness to the client was being achieved.
6. Several firms were building long term relationships through T T projects. There was evidence of changing technology transfer practice in the last few years that was more beneficial to developing country clients.

9.1 INTRODUCTION

The purpose of this chapter is to link the empirical work of Chapters 7 and 8 to the earlier theoretical discussions, highlighting some of the contributions which emerge from the present work.

9.2 CONCLUSION FROM THE ECLECTIC THEORY

Ownership Advantages

Most of the characteristics that Dunning emphasised were to be found in consulting with the exception of physical capital and access to raw materials. Consultants were able to differentiate the service that they offered through the activity of the TT service. The predominant emphasis under consultants' ownership advantages was upon human capital skills in an individual and organisational sense, and many of these were specific to the home country.

Firm Specific

As part of their T T project work, firms were called upon to contribute their own firm's expertise (see Table 9-1). This included the ability to offer both organisational and management experience relevant to consulting which included extensive experience in technical design. As well as the functional sides of their business (accounting, bidding, marketing etc.), part of this experience was know-how of the latest or most appropriate materials to specify and incorporate in projects' designs as well as the supervision of international contractors who would construct the work. Sector expertise was on hand in such areas as bridges, waste, water etc., and many others (as listed in Figure 8-2). Special areas were also offered under the heading of maintenance management, which was particularly needed seeing that some capital projects of earlier decades had deteriorated rapidly in some developing countries. Others were institutional strengthening and organisation of cooperatives etc.

The intangible nature of consulting surfaced in the advantages related to reputation, conveyed through good communication qualities, humanitarian ideals and creative ideas and thinking. Boddewyn's view of firms carrying an identifiable image which gave them an advantage over lesser known enterprises was certainly true of UK consultants although it was not stated explicitly in the cases. Harder elements were displayed through the vehicle of information technology and software and modelling etc. which clients could identify visibly via computer equipment. Contractors and suppliers most commonly offered knowledge of construction techniques and equipment processes in their respective spheres of operation.

OWNERSHIP ADVANTAGES OF CONSULTING FIRM

Firm Specific

Organisational & Management Experience in Consulting
Track Record in Design and Construction
Legal, Accounting & Marketing Skills of Consulting
Bidding and Programming Techniques on International Projects
Supervision of International Contractors
Research know-how of Civil Engineering Products
International Seminar Organisation
Project Management
Additional Capacity Provision
Ability to Offer Appropriate Communication Skills
Less Rapidly Delivered Project Orientation
Humanitarian Non-mercenary Approach
Creative Ideas on TT Aid Packages
Institutional Strengthening
Intermediate Technology
Setting up Third World Cooperatives
Information Technology and Databases
Expertise in Specific Areas (e.g. Agricultural, Maintenance etc.)
Expertise in Specific Sectors
Technological Expertise in Computing (e.g. CAD, Software, Modelling)

Country Specific

Professionalism and Independence Ethics
Interpretation of British Based Design Codes
Legal & Accounting Expertise
Liaison with UK Universities
Placing of Overseas Staff at UK Educational Establishments
Liaison with UK Merchant Banks
Particular Sector Expertise Developed in the Home Market
(e.g. Infrastructure Development & Urban Planning, Tall Buildings, Power etc.)
UK Aid Agency Backing and Funding

OWNERSHIP DIS-ADVANTAGES OF CONSULTING FIRM

Country and Firm

Large Project Packages ill-suited to the TT
Dearth of Overseas Experience for Younger & middle Staff
Consultant being used as Design Contractor
Undercapitalised Position of Firms
Inappropriate Company Structures
Lack of Social Adjustment of Expatriates to Local Conditions
Poor Communication Skills of Expatriates
Slow Technical Adjustment of High Tech Staff
British Council and BBC World Service Cutbacks
Insufficient Professional Indemnity Cover in Risky Countries
Failure to Satisfy both Aid Agency and Client
ACE Restrictions
Lack of Full Appraisal on ATP Projects for Effective TT
Strong Reputation in one Discipline Stereo-typing firm
Design of High Buildings for low Cities

Source : Author

TABLE 9-1

Country Specific

Some advantages were specific to the home country, such as UK professional and independence ethics, interpretation of British codes of design and contract systems (see Table 9-1). Clients also favoured UK universities and links with them were occurring via T T projects. Funding was arranged through UK merchant banks which made possible the privatisation deals that took place in Asia. A certain amount of cooperation was recorded with British contractors through design & construct packages but, on the whole, these national links did not appear to be of major significance for UK consultants. Seymour had predicted that, through related services, contractors would find links with UK consultants to their advantage in advance information sourcing etc. but the reverse did not seem to hold so well.

Certain expertise had been developed within the home market itself, such as infrastructure & urban planning, tall buildings and power sharing. The dominant influence for consultants under country specific advantages however, was that of bilateral aid funding which opened up opportunities for UK firms at sufficiently low levels of risk to make international T T work attractive for them in a wider scatter of locations than they would normally have tackled (see Table 9-1).

Ownership Disadvantages

Some of the UK consultants' strengths could also appear as weaknesses if proper adaptation of them did not take place in the host country context (see Table 9-1). Since clients were at liberty to call for projects which were not always totally suitable, this did not make it any easier for consultants to get the balance right.

Large project packages with tight completion dates sounded laudable but they could be ill-suited to the T T process, where steady assimilation was most needed. Computerised technology or plant intensive methods had each been used on occasions by suppliers and contractors to the developing countries' detriment. Expatriate staff sometimes fell short in communication skills and were ill at ease in adapting to a lower or mid-tech environment. Firms also found it hard to convince clients of the full range of their skills, sometimes because they were too renowned in one

sector of experience. On other occasions again, their skills were being underutilised as "design contractors".

At a country level, UK government expenditure reductions in the British Council and BBC World services, along with poorer offerings in free feasibility studies as compared to competitors, did not assist UK consultants. As earlier observed, some countries would adapt technologies that they had received and re-export them in a form more suited to their neighbours. In this vein, second world countries were more appealing to some aid agencies and this gave rise to concern in some quarters.

Internalisation Advantages

Many firms had specialist sub-units and divisions available to service a client's need, as well as large networks of offices and a considerable presence in many countries (see Table 9-2). All this allowed rapid access to staff expertise and computing facilities etc. so that sharing of information was possible across networks to enable a firm to compete internationally in a more focused fashion. Through the T T medium itself, some firms saw growth of their activities expressed via the strengthening of their office subsidiaries.

Seymour's suggestion that, where control could be exercised, ownership might be extended beyond "100% ownership" and that joint ventures etc. could be considered within the organisation of the firm, was validated in consulting cases. Firms found it possible to liaise with a selection of developed country consultants and contractors which enabled them to access finance, design & construct packages and "boot" privatisation deals. Control was not always exercised, however, when joint ventures were made with some, but not all, local consultants and in these cases it had to be counted as a form of externalisation. This was displayed by an unreliable level of local staff expertise which added to uncertainty. For this reason firms were at pains to ensure that a sufficient depth of their own in-house competence was on the spot to ensure that their projects, mostly unstandardised in nature, could be carried out safely and to a sufficient level of quality. This was one reason why they favoured the carrying out of the design in their home offices because uncertainty could be reduced to more easily manageable levels. Contractors themselves experienced the same unease in the host country over the interpretation of the experience of middle management local staff. However suppliers were

INTERNALISATION ADVANTAGES OF CONSULTING FIRM

- Full breadth of specialist sub-units & divisions available**
- Reduced need to acquire external skills**
- Succession of local offices multiplying worldwide**
- Spread of technical solutions between countries**
- Access to concentrated resources of staff know-how**
- Tapping staff availability across offices**
- Wide coordination possible across firm's regional networks**
- Ability to respond quickly to client need**
- Greater time to supervise host country staff secondments**
- Personal attention offered at senior level for TT**
- Recipients of TT easily assimilated into firm**
- Recruitment of competent host country personnel**
- Availability of total computing capability**
- Exposure to wider use of construction materials**
- Access to in-house financial arms**

INTERNALISATION DIS-ADVANTAGES OF CONSULTING FIRM

- Local JV partners assigned in unplanned fashion by client**
- Lack of certainty over capability of JV local staff**
- TT supported only from profits of JV**
- Client offices as useful and cheaper than subsidiary offices**

Source : Author

TABLE 9-2

noticeably more prepared to work at arms length through agents. Here it was particularly interesting that the only mention of licensing came in the single case which covered suppliers.

Exporting and FDI in consulting can be interpreted in a similar fashion to that which Seymour suggested, except that consulting was shown to be even more mobile than contracting and was far less tied to a project site, in fact permitting the T T activity to be conducted in any number of locations. However a local presence was retained by certain firms to impress clients as part of a soft marketing ploy. Also they could be useful listening posts, although the T T location itself provided information on upcoming projects and this was not exclusively tied to the firm's offices. A further factor to note was that low overhead organisations, which some firms were using to arrange T T projects, was threatening to displace the whole concept of established offices. In such situations the idea of international business moving through the steps of exporting to full FDI had to be modified, particularly as it was the client's offices that were usually being used rather than those of the firm when the T T process was underway. All this might be interpreted as a function of both the intangibility of the consulting asset and a greater volatility in T T consulting services.

Internalisation Disadvantages

There were certain disadvantages also associated with internalisation (see Table 9-2). Some firms did not avail themselves of the opportunities of participation in equity involvement because their company structures were ill-fitted or undercapitalised, perhaps by choice. There was an over-bureaucratic and tight procedural approach to centralisation in some firms which appeared to reduce the abilities of their networks to function efficiently. More decentralised firms were deemed to operate better and take up local opportunities more adequately.

Locational Advantages

The nature of the T T process led firms to take on the infrastructure needs of low income and middle income countries where a greater proportion of a client's budget was known to be allocated to construction.

The main advantage derived from a presence in the host country location was to gain influence with the client and decision makers in the highest seats of government (see Table 9-3). Sometimes this meant becoming well known in local circles to influence the early stages of project selection or, in the later stages, to hasten the payment of outstanding bills. Subsidiary offices sometimes gave an assurance of roots in a country and an appearance of full commitment. A by-product of local influence was the opportunity for discernment of a client's need at first hand and explanation of the firm's full available service. Basic local assistance also gave the firm a chance to familiarise itself with local knowledge, prices and standards or even language. Costs were reduced when local staff were used and proposals were made cheaper as a result. A good local base certainly helped to gain favour in short listing and the bidding that was done there was more likely to take account of local conditions.

A well established local base in selected centres in a region was useful for extending the firm's influence to neighbouring countries, as Davidson noted, usually along readily accessible airline communication routes. It was also possible to identify good local staff, as Dunning & Norman observed, who could be recruited into the world wide projects of the firm.

Locational Disadvantages

Locational aspects were not always favourable and there were some disadvantages for the firm (see Table 9-3). Sudden changes of government could bring continuation work to an abrupt halt. Even in a more quiescent climate, local joint ventures were sometimes forced upon firms and they did not find themselves free to choose their own local partners. If local staff were used they could also be of uncertain quality which led to doubling up of resources in some situations. (Indemnity insurance was not readily available in the more troublesome regions). Clients and agencies could be out of step with each other over the extent of approval that they would each grant a firm; both organisations had to be "cultivated". In some areas of the world there were unsustained levels of demand which made it worth working across a geographic region to even out the temporary troughs that occurred in some countries; however this policy was not assisted where there were political rivalries between neighbouring independent territories.

LOCATIONAL ADVANTAGES OF CONSULTING FIRM

Political influence at highest level (eg premier access etc.)
Payment of bills accelerated
Greater closeness to client ministries & decision makers
Client contact increased
Soft marketing possible
Indication of full local commitment given
Firm regarded as local firm with strong roots

Identification of client problems at first hand
Local sources of knowledge on prices, standards etc.
Access to a local base
Language barriers overcome
Access to technical capacity
Good access to labour & work ethic
Recruitment of permanent personnel facilitated
Convenient airline communication links between countries

Costs of proposals lowered
Low tech work done at lower cost than home offices
Advice in mounting suitable proposals obtained
Favour in short listing
Opportunity to explain consultant's service

LOCATIONAL DIS-ADVANTAGES OF CONSULTING FIRM

Sudden changes of government & decision makers
Insufficient cover in risky countries
Poor diplomatic and social conditions in certain regions
Failure to satisfy both aid agency and client
Former TT contacts leading to reluctant clients
Unsustained level of demand in some countries
Rivalries and prejudices between countries

Source : Author

TABLE 9-3

9.3 CONCLUSION FROM THE STAGES-OF-DEVELOPMENT APPROACH

"Proportion of sales" has often been used as a guide in international penetration and this was similar in the consulting sector, where the measure was the "proportion of total staff employed on overseas work". Many of the consulting firms had very experienced managers, although some of their organisations also demonstrated the kind of rigidity, reflected in company structures, which were not responding effectively enough to regional opportunities. Just as "light" exporters are subject to more risk, similarly consulting firms were able to limit their office costs by working overseas out of client offices. As regards firm size, the advantages of economies of scale were evidenced by firms spreading solutions to technical problems across offices or interchanging staff according to worldwide project need. However some of the medium sized firms with a good spread of offices seemed to do this just as effectively as the larger ones.

Information on upcoming projects was gathered in whatever place the firm was engaged on work for a client. However the point of contact for the firm might not only be in its own established subsidiary offices but also in project or client offices or even the firm's home offices. Direct travel still produced results on information for new projects but it was really secondary to existing contacts that consultants already had. Contractors relied more on direct travel however.

There was some evidence of information being consolidated formally across national networks in the very large firms although the informal contact and regular meetings of some firms' seniors probably allowed leads to become well known internally. One of these large firms seemed to run autonomous divisions with limited cross-contact between them. Another did not seem to receive the full reports that it might expect from its international spread of offices.

A good number of the projects, as mentioned by each firm, were aid projects suggesting that links with these bodies were already established, even if only loosely. Certainly most of the firms had been able to identify and win T T projects that were aid funded. Competitor governments were seen to offer free feasibility studies and these facilities were thoroughly exploited by Canadian firms in particular to open up the T T market in Asia across national borders, although

Russian organisations had the same free backing but failed to integrate sufficiently through joint ventures in the host country to give their reports enough impetus.

9.4 CONCLUSION FROM STRATEGY THEORY

The advantages of the global platform were evident in Singapore where one newish firm had decided to establish its headquarters. Good quality labour and educated staff, low costs and access to rapid communication links provided good reasons for such a base. For UK firms, London was an equivalent platform with the slightly lower costs being provided through their UK regional domestic network. As Porter noted, some activities could be concentrated and other dispersed. Head offices usually had substantial reservoirs of staff expertise and computer facilities, while low tech work could be dispersed satisfactorily to subsidiary or other offices in the host country. This was facilitated by the ability to communicate through fax machines and rapid airline links.

Many consulting firms had adopted country centred strategies and, as Chakravarthy and Perlmutter suggested, this was in response to the greater strength of the host country rather than the firm. Certainly consulting firms leaned more towards internationality rather than multinationality. Three of the firms had developed their local bases to such an extent that they had almost become better established in the continents of Africa and Asia than they were in the UK. Most firms were dominated by an ethocentric culture; this was reflected in the very low number of partners and directors that had been appointed from the country or regions where the firms worked. Local staff however were employed in subsidiary offices and this sometimes formed as much as a quarter or third of total firm staffing worldwide, which suggested moves towards a more established regiocentric position.

Some small to medium sized firms had established themselves in the medium (even high) tech categories of work by a good promotional effort. In the same way that non-dominant firms segmented low tech markets to advantage, consulting firms demonstrated that they could provide a ready service to clients in the less attractive poor economy countries by being constantly on hand and around their offices. Another factor was that managerial time might constrain the activities of the smaller firm. Certainly where outside staff were interviewed for overseas T T projects placements, it demanded considerable managerial input at interviews and

also at the early project stages in setting up the operation. This was partly dealt with by a more generous spread of directorships per member of staff than might be found in the larger firm.

Porter suggested competitive advantage could accrue from the value a firm could create for its clients. Some consulting firms were aware that clients placed a higher value on technology transfer than they themselves would have been prepared to ascribe to it. Any service business is particularly client centred but some consulting firms had adapted their business to fill the special needs of clients and aid programmes. In doing so they had differentiated their business through focus on technology transfer in projects. This was reaping both long term gains for some firms and short term ones particularly for the medium sized firms who seemed to be able to adjust to client locations more readily and take advantage of changing requirements for subsidiary offices.

9.5. CONCLUSION FROM PROFESSIONAL SERVICES THEORY

Schmenner had suggested that professional service firms would need to accommodate themselves to changing client requirements. One such change was the decision by some firms to move away from a pyramid structure by recruiting experience instead from outside the firm. This involved a different leverage of low cost and high cost staff. "Grey hairs" staff, as described by Maister & Bloom, were most commonly needed on T T projects but "strong delivery" firms, after Coxe, were not so much in evidence or required on T T projects. The needs of the market were calling for a "stronger service" approach instead. This did not exclude the "strong idea" firm because projects, requiring a creative or difficult solution, continued to occur with some clients and firms were being drawn closer to the client in this way.

There was little doubt that firms were attracted overseas by specific funding for T T projects and maximum use could still be made of sound experience gained around the world. T T projects required highly paid senior staff more than on regular productive projects so that, in this sense, staffing dominated the consulting T T business even more than before. In the late eighties the healthy UK domestic construction market was in marked contrast to earlier years of the decade and this suggested that firms were finding it no more easy to find the right calibre of staff

for their projects. In some of the larger firms, it was proving difficult to get them released internally for projects overseas.

Consulting, like other professional services work, contained considerable intangibility and required much interaction with the client. It was apparent that clients liked to be courted by those actually performing the task. On T T projects there was less need to rely on persons with a flair for promotion which, in any case, had not always achieved the hoped-for result in the past. It was clear that through T T projects, firms were able to explain their service better at close quarters, often being resident themselves in client offices. Certain types of professional firm, mostly "practice-centred" in nature, could make a considerable impact on a client; this was evidenced by at least one such firm whose aims were "humanitarian rather than quick money" orientated.

Gardborn & Rhenman's view, that some projects had certain characteristics which would make for more secure establishment in the host country, was shown to be the case in the long term relationship fostered with clients through organisationally complex projects and those sectors involving basic infrastructure, road maintenance and property development.

9.6 CONCLUSION FOR TECHNOLOGY TRANSFER

Contractor's view that T T was more of a relationship than an act was borne out in the cases. However in these, there were some deviations from Abbott's (85) view of T T in civil engineering: for instance consultants related both their sophisticated and straightforward designs to suit the local requirements of clients. That which was related to construction also required senior levels of management experience in the cases of consulting, although contractors usually seemed to relate their construction T T at middle and lower levels. There was concurrence with Schumacher's theme that Western based T T had too often been equipment orientated rather than people-centred or labour-based. Effective transfer also had to include a proper understanding of behavioural and cultural approaches. Those firms who had sought to make T T most suited to developing country needs found a steady stream of work, although there was much evidence of host governments themselves acceding to super technology for prestige or funding availability reasons.

Clients were usually adopting an "organisational" route for T T which led to 2-way traffic back to home offices from host countries. However as one of the cases (dealing specifically with personnel in host country organisations) showed, they did also recruit "individuals" who seemed to make a worthwhile long term contribution and did not withdraw their services in midstream leaving discontinuities, as Sharma suggested they might.

Abbott had indicated that counterpart project training was becoming a more favoured means for T T than that of local subsidiary employment. In fact the means of T T were even more dispersed than that with client offices, local consultant and home offices all playing a part. There appeared to be a greater willingness to be specific on T T projects as to requirements than had been the case in the early eighties. However, there was still the problem of price competition conflicting with T T requirements. Nevertheless, some projects were substantially or totally focused on T T and, in those that were not, there appeared to be a greater acceptance by consulting firms that T T was here to stay and needed close attention; it could affect their post-project vetting or bidding success for the next project.

Most consultants were adopting strategies somewhere between the "control" and "marketing" strategies of Sharma and there was little evidence of a "cash cow" opportunism. In other words they tried to achieve long term influence and also carry out their projects in their chosen product sectors, without attempting to make a high profit short term gain. This posture was partly encouraged by a belief that long term influence to client structures could be achieved with a more steady and "less calculating" approach. There was certainly evidence of some consultants achieving repeat orders with clients through aid T T projects over more than two decades as was found with management contracts. Several other firms had built and were building relationships to ensure that this sort of dependence continued. Often these contacts seemed to flower best amongst those clients where there was a dearth of continuing local capability.

In both Asia and Africa, firms who were new to a country were able to begin to work overseas with small T T assignments and then graduate up the scale of competence to longer and larger projects. T T was "soft knowledge", permitting good contact between client and consulting firm. On occasions the employment of local staff gave rise to the establishment of local firms but this was not observed to the same extent

as in management consultancy. Nonetheless considerable goodwill and social benefit were also being engendered particularly where T T projects were conducted in lesser economies.

Important parts of a project's design were being carried out in the home country, where host country personnel were also seconded, although low tech parts were invariably transferred to the host country. This gave opportunity for discussion of the principles and criteria behind a project, which suggested that some of the criticisms of T T emanating from developing countries would find less foundation currently than they had in the early eighties. There was little sign of local firms taking on anything but the smaller works except in certain countries like Turkey or Malaysia etc., so that integrated international projects were still requiring the services of incoming consultants, as Sapir had hinted they might well do. Younger local staff on these projects were being employed but there appeared to be more serious moves to make use of middle ranking staff in countries where they were available, which was the kind of progress that clients had wanted. Governments and aid agencies seemed to have grown more particular rather than less, over the experience level of staff that they vetted. Degree of competence was still being measured in years of experience and there was insufficient call for middle ranking expatriate staff.

In many places, host country governments continued to influence strongly the decision on the personnel to be assigned to a T T project, sometimes leaving out what consultants saw as obvious candidates. Late assignment, understaffing and lack of commitment had changed little in the last few years. The strong overall influence of external circumstances was found to pervade many T T projects in African countries. Usually it was in these countries that T T had to be perpetuated because of the administrative burden being thrust too early upon younger host personnel. Project management culture in Central Asia had its own bent which needed to be cultivated locally and this was often at odds with a western ethos. There was still the pitfall of a "vacation" attitude, wherever secondment occurred to the home country. Most firms seemed to be aware of this and had tightened their programmes to cope by putting personnel to work, instead, on a live project in their home offices. The brain drain from developing countries to more prosperous areas, or occasionally to aid agencies, was just as evident as in the early eighties. Where consultants lacked skills in areas of growth (which aid agencies were prepared to

fund) firms seemed to have taken the trouble to recruit at sufficiently senior levels. Most firms however chose to operate in their chosen fields of experience, which were multidisciplinary or multispecialist for the larger firms.

CHAPTER 10

POLICY RECOMMENDATIONS

10.0 SUMMARY OF CHAPTER 10

1. Consulting firms need take a longer term view of the trade cycle, maximise university links, beware of organisational problems within their organisations, become less ethocentric in their senior appointments and be aware of the short, medium and long term attractions of technology transfer.
2. Contractors and suppliers should explore creation of T T projects through aid funding. UK government should be made more aware of the opportunities available to consultants through aid projects. Fee competition at home may not help international professionalism. Host country clients should not over-value prestigious projects, academic qualifications or lengthy experience. Aid agencies need more coordinated planning at a local level. Consultants' ideas on projects should not be stifled by even handedness.

This concluding section covers suggestions for specific policy applications; these are summarised briefly under a succession of short headings in order to draw attention to the points raised. (see Table 10-1 and Table 10-2) Most are applicable to the consulting firm itself while the remainder are related to other parties who are active with them in the international construction TT process; these include contractors & suppliers, UK home government, host country clients and aid agencies.

10.1 POLICY FOR CONSULTING FIRMS

BUILD ON HOME SECTOR EXPERTISE: Some sectors such as tunnels, rail links and defence have attracted considerable investment in the UK of late. Quality assurance mechanisms are very much part of the latter. TT expertise gleaned in these areas should be seen as a basis for future expansion abroad.

UK GOVERNMENT POLICIES NEED WATCHING: Just as UK aid has followed the policy of the government in office, firms need to observe where influence is being

SUMMARY OF POLICY RECOMMENDATIONS FOR CONSULTING FIRMS

BUILD ON HOME SECTOR EXPERTISE
UK GOVERNMENT POLICIES NEED WATCHING
TAKE A LONG TERM VIEW OF THE DOMESTIC TRADE CYCLE
MAXIMISE UNIVERSITY LINKS
APPROPRIATENESS AND COMMUNICATION SKILLS NEED EMPHASIS
GUARD AGAINST DILUTION OF SKILLS
CERTAIN PROJECTS ALLOW EXTENDED CLIENT CONTACT
CONSIDER ADOPTING A DIFFERENT TYPE OF ORGANISATION
CONSULTING STAFF ARE LOSING OUT ON INTERNATIONAL EXPERIENCE
BEWARE OF OVER COMPARTMENTALISATION
UNDERCAPITALISATION MAY HOLD BUT MORE RISKS
MEDIUM SIZED FIRMS CAN WIN ON SERVICE
SOME SUBSIDIARY OFFICES NEED TO BE SHED
BECOME LESS ETHNOCENTRIC
LINK UP WITH OTHER FIRMS WITH EXISTING OUTLETS OR STRONG PRESENCE
EXPLORE LINKS WITH SUPPLIERS
EXPLORE OTHER AVENUES WITH LARGE ENTERPRISES
CAPITALISE ON NETWORKS WITH FOREIGN FIRMS
T T HAS SHORT TERM ATTRACTIONS
T T HAS MEDIUM TERM GAINS
T T SHOULD BE A LONG TERM STRATEGY
T T CAN BACK FIRE ON CONSULTING FIRMS
LOW DEMAND COUNTRIES CAN PROVIDE EXTENDED OPPORTUNITIES
T T ALLOWS FREE ACCESS TO CLIENT ORGANISATIONS

Source : Author

TABLE 10-1

extended or withdrawn. This may be a deciding factor in their own TT investment plans in selected host countries.

TAKE A LONG TERM VIEW OF THE DOMESTIC TRADE CYCLE: Consulting firms need to be careful that they treat international construction as an ongoing process proceeding from one decade to another. Temporary withdrawals of interest in favour of a buoyant home market compounds continuity difficulties in some countries at a later date.

MAXIMISE UNIVERSITY LINKS: To start on the consulting ladder, staff usually need to obtain a first degree. Overseas students continue to come to the UK universities for 3 year periods or more. It is clear that developing countries aspire to academic achievement in the form of higher degrees more than UK firms realise, or value themselves. There are opportunities for greater cooperation by using expertise from UK universities & colleges and by establishing links with current and prospective students. Firms may be able to facilitate entry to further degree courses for individuals in the countries where they work or intend to gain influence.

APPROPRIATENESS AND COMMUNICATION SKILLS NEED EMPHASIS: In order to conduct TT projects satisfactorily, firms need to pay attention to the development of the communication abilities of their staff. Great care needs to be taken in implementing projects as appropriately as possible in the environmental and cultural setting of the countries where the project takes place.

GUARD AGAINST DILUTION OF SKILLS: TT projects seem to be demanded and taken up by firms primarily in the area of their existing experience. There are dangers for staff conducting repeat projects. If these are conducted (which are along the lines that have been carried out previously), firms may not be able to rely on TT projects to generate the kind of challenge that will protect their firms from dilution of skills.

CERTAIN PROJECTS ALLOW EXTENDED CLIENT CONTACT: Firms need to be aware that long term lasting contacts are built up often with difficulty in some sectors of work. However, roads, bridges & buildings and projects of a maintenance nature are likely to engender a sound client contact over time.

CONSIDER ADOPTING A DIFFERENT TYPE OF ORGANISATION: TT projects may not easily be able to support the traditional pyramid structure of a consulting firm. Firms should consider adopting a system which uses semi-permanent staff for their TT assignment work, which might necessitate divisionalising the firm into lower overhead units in certain areas.

CONSULTING STAFF ARE LOSING OUT ON INTERNATIONAL EXPERIENCE: There is a tendency for clients and agencies to request staff with extensive experience. Firms need to work hard to plan openings for their junior and middle staff to access more international experience. To neglect this aspect could lay up considerable problems for the activity of UK international consulting in the mid and late nineties.

BEWARE OF OVER-COMPARTMENTALISATION: Some firms are established with their several partners (or directors) each being responsible for particular sector expertise. Firms need to watch that they maximise their own multi-disciplinary opportunities in all the countries where they work. The overall firm can lose out if the individual partners guard territorial areas too closely. They may see this as being expedient in order to reinforce a cherished client image of their firm with strengths in one or two particular sectors only.

UNDERCAPITALISATION MAY HOLD OUT MORE RISKS: The financial position of many large consulting firms does not suit them to much equity involvement. In the future they could be easy targets for takeover and purchase by larger recently privatised construction bodies. It is possible that many consulting firms might benefit by moving to a broader equity based company structure and be better placed to service future international markets.

MEDIUM-SIZED FIRMS CAN WIN ON SERVICE: Firms in the medium-size range of 250-300 staff and below are often small enough to give personal attention to TT staff from host countries in a way that often seems to elude some of the larger firms.

SOME SUBSIDIARY OFFICES NEED TO BE SHED: The strategic nature of overseas offices may need reviewing from that of a decade ago. Firms have to

evaluate just how useful offices are for obtaining and conducting project and TT work in some countries. Where offices are in place, full advantage should be taken by ensuring that regular market development reports flow from them and that their senior staff abroad are properly briefed to carry out this activity.

BECOME LESS ETHNOCENTRIC: UK consulting firms show a strong bias for British management at partnership and associate level. Given that considerable numbers of local host country staff are employed, consideration needs to be given to a staff policy which may show greater positive discrimination at regional and head office for non-British personnel. This is likely to assist the firm in its project and TT work and maintain a lead over second world firms who can claim that their skills are more appropriately orientated to third world clients.

LINK UP WITH OTHER FIRMS WITH EXISTING OUTLETS OR STRONG PRESENCE: Just as firms need to review their own office locations they also need to analyse where other consulting firms have well established outlets and cooperate accordingly, if necessary on an exchange basis offering facilities from their own offices elsewhere. This is more likely to be taken up by firms who complement each other's sector skills.

EXPLORE LINKS WITH SUPPLIERS: Although the TT element of consulting is dominated by the human capital element consultants have to advise on the incorporation of equipment into the design of projects. At other times there are opportunities for supply or purchasing contracts with clients; firms could well enlarge their business by more active reciprocative links with UK supplier firms.

EXPLORE OTHER AVENUES WITH LARGE ENTERPRISES: Just as client offices have become the site of consulting activity, there may be openings for firms in operating from the offices of multinational enterprises abroad or from the overseas offices of home clients with whom they have projects.

CAPITALISE ON NETWORKS WITH FOREIGN FIRMS: UK consulting firms appear to be more adept than other construction parties at cooperating with a widespread of other nationality firms, in both consulting and contracting throughout the world. These networks of relationships are wide compared to other nationality competitors and should be built upon.

TT HAS SHORT TERM ATTRACTIONS: Firms are likely to find client contact is increased and that greater influence can be brought to bear on decision-makers; this assists the bidding process and also allows a firm to explain its service better.

TT HAS MEDIUM TERM GAINS: Firms' reputation is enhanced through carrying out TT and they are seen as contributing to the development of the country. Project work itself is easier to carry out and language barriers can often be overcome. Good personnel can also be recruited into the firm for permanent engagements elsewhere.

TT SHOULD BE A LONG TERM STRATEGY: Contacts made in early years from former recipients of TT usually favour the firm especially since these individuals soon rise to senior positions. These contacts are found mostly in client organisations but also in local firms and some aid agencies. While TT would appear to undermine the possibility of long term commissions this is rarely the case. Clients and host countries frequently lack the staff resources and there is often a drain of personnel from their organisations. Many countries are insufficiently developed in their higher educational sectors to be able to sustain a flow of people into host country consulting or client positions and this is not helped by the length of time it takes to become established as a local organisation with international capability to handle larger projects. External circumstances of fast birth rate, poor local economies and corruption all perpetuate such a dependence.

TT CAN "BACKFIRE" ON CONSULTING FIRMS: Considerable care is needed to handle personnel from host countries. One "bad" experience from a recipient, often at a personal relationship level, can cancel out many other excellent TT achievements. This can have a long term effect on business in a region for some years afterwards.

LOW DEMAND COUNTRIES CAN PROVIDE EXTENDED OPPORTUNITIES: The value of working with clients in territories with relatively low budgets should not be underestimated. Often TT work is continuous and firms who have taken the trouble to develop local deeply rooted contacts are favoured time and again.

TT ALLOWS FREE ACCESS TO CLIENT ORGANISATIONS: Many firms spend money on marketing their services to client organisations which can involve regular visits to countries, opening offices etc. The TT process allows a firm to be reimbursed for their current services and permits them to glean information on future work from the client at first hand and at no extra cost.

10.2 POLICY FOR CONTRACTORS & SUPPLIERS

TAKE A LONGER TERM VIEW OF TT: Shareholders need to be persuaded of the possibility that a more buoyant view can be taken of TT projects given that there can be significant short, medium and long term hidden advantages (even though the short term profitability may be low). This may involve preparedness to put down roots in certain countries by backing offices for longer periods or by investing in local companies possibly obtained through acquisition.

AID PROJECTS CAN ALSO SUIT CONTRACTORS & SUPPLIERS: Both these groups should investigate the TT aid packages available from such agencies as the EEC or World Bank in specific sector areas. By accessing aid funds, they may also be able to develop longer lasting relationships with clients, especially if they are creators of full TT projects, which the client would not otherwise be able to afford.

FINANCIAL AND MANAGEMENT EXPERTISE ARE NEEDED: Contractors & suppliers, from their extensive resources in management and arrangement of finance, have much to offer the developing country construction sector. Their experience of "boot" and TT privatisation deals could be made available to a wider country audience. This may however require a company policy with much less concentration upon very large fast moving projects; it may also lead to an internal restructuring of their organisations to work on a basis of a lower overhead base. The benefits for the name and reputation of the wider company group could be considerable if this is done, although margins in the TT area itself may be modest in the short term.

COOPERATE WITH UK CONSULTANTS: The networks which consultants possess are wide and their projects are numerous. Consultants have usually developed

SUMMARY OF POLICY RECOMMENDATIONS FOR OTHER GROUPS

CONTRACTORS & SUPPLIERS

TAKE A LONGER TERM VIEW OF T T
AID PROJECTS CAN ALSO SUIT CONTRACTORS AND SUPPLIERS
FINANCIAL AND MANAGEMENT EXPERTISE ARE NEEDED
COOPERATE WITH UK CONSULTANTS

UK HOME GOVERNMENT

EXPENDITURE REDUCTIONS HAVE LONG TERM REPERCUSSIONS
THE CONSULTING SECTOR NEEDS TO BE TREATED AS A SEPARATE INTEREST
CONSTRUCTION GROUP
COMPETITOR FEASIBILITY STUDIES ARE BETTER SUBSIDISED
BILATERAL AID MULTIPLIES OPPORTUNITIES FOR UK CONSULTANTS
FEE COMPETITION DILUTES INTERNATIONAL PROFESSIONALS
EUROPEANISATION IN STANDARDS WILL PROSPER EUROPEANS

HOST COUNTRY CLIENTS

PRESTIGIOUS PROJECTS HAVE THEIR LIMITATIONS
ACADEMIC QUALIFICATIONS HAVE THEIR PLACE
OVERSTRETCHED "WORKS" MINISTRIES NEED
PRIVATE SECTOR BACK-UP
LENGTHY EXPERIENCE IS NOT ALWAYS BEST
T T PROJECTS NEED TO BE FIRMLY ADMINISTERED

AID AGENCIES

CONSULTANTS BENEFIT FROM AID WORK
AID COORDINATION IS NEEDED AT LOCAL LEVEL
AIDED PROJECT IDEAS AND EVEN-HANDEDNESS ARE MUTUALLY EXCLUSIVE
INTRODUCE FLEXIBILITY INTO CONSULTING FIRMS APPOINTMENTS

Source : Author

TABLE 10-2

relationships more sensitively with developing country clients over a longer period of time. Greater cooperation is recommended with consultants especially in countries carrying low or intermittent demand.

10.3 POLICY FOR UK HOME GOVERNMENT

EXPENDITURE REDUCTIONS HAVE LONG TERM REPERCUSSIONS: The view of consulting firms is that long term influence for British business is propagated through such instruments as the British Council and BBC World radio service. Curtailment of these services can only detract from the beneficial effect which the UK consulting sector has experienced over the years.

THE CONSULTING SECTOR NEEDS TO BE TREATED AS A SEPARATE INTEREST CONSTRUCTION GROUP: There are notable differences between consulting and contractor & suppliers firms in relation to the value of the TT process long term. The latter see little benefit while the former see a perpetuation of work into the middle term and beyond. The practice of addressing the UK international construction sector as if it is mainly contractor orientated needs changing, particularly as consultants' networks and influence are so widespread.

COMPETITOR FEASIBILITY STUDIES ARE BETTER SUBSIDISED: While the Overseas Projects Board allows a proportional grant on feasibility studies for large projects, competitor governments are far more supportive of their own consulting sector. Canada, for example, uses its free feasibility study approach to win consulting work successfully in competition with UK firms.

BILATERAL AID MULTIPLIES OPPORTUNITIES FOR UK CONSULTING FIRMS: Aid projects have an added effect in terms of their value because they allow firms to enter territories and establish footholds in new areas in the knowledge that their fees will be met by British backed aid. Once there, firms are often able to develop new openings. The expansion of aid projects, therefore, would considerably assist continuing business relationships for the UK consulting sector.

FEE COMPETITION DILUTES INTERNATIONAL PROFESSIONALISM: UK consultants' current reputation for professionalism is certainly based on client experiences of well executed past projects. Since the mid-eighties fee competition

at home has forced a lower standard offering upon consulting firms. It remains to be seen how far fee competition in the domestic sector will restrict future advances overseas for the consulting profession as a whole.

EUROPEANISATION IN STANDARDS WILL PROSPER EUROPEANS: Greater moves to attune British practices to European methods will mean that former British domains will cease to be the preserve of UK consultants on account of the methods and codes that these countries use. French or German firms will be able to compete just as easily, which will stiffen competition for the British sector.

10.4 POLICY FOR HOST COUNTRY CLIENTS

PRESTIGIOUS PROJECTS HAVE THEIR LIMITATIONS: Projects which are very large often have tight completion dates and tend to exclude the possibility of adequate TT at a pace which can be reasonably assimilated by local personnel. Prestige may accumulate for local leaders and technocrats but there can be a price to pay in terms of lost TT opportunities.

ACADEMIC QUALIFICATIONS HAVE THEIR PLACE: Compared to the UK, developing countries often prize further degrees and use them as screening devices for management or stepping stones to promotion. This can lead to an underemphasis on experience which is usually what is being sought from the consulting firm. At other times governments may see an overseas placement on degree courses as a cheap and prestigious form of TT. Clients need to be realistic in their assessment of all of the TT routes available. On the other hand, it has to be understood that a local consulting and client capability has been built up most effectively in those countries which have a strong background of graduate trained staff.

OVERSTRETCHED "WORKS" MINISTRIES NEED PRIVATE SECTOR BACK-UP: There are limits to the capability of local public works departments to handle construction projects. In many developing countries the consulting and contractor private sector are small but growing. Host governments need to decide how much can be reasonably channelled through their public sector arms and how much should be put out to competitive fee tendering. Encouragement needs to be given to local private and public sector organisations and this is best done through the continuation of well thought out TT schemes.

LENGTHY EXPERIENCE IS NOT ALWAYS BEST: Length of experience is not necessarily the fairest guide as to the experience required of incoming expatriates. Personnel in their early or middle career stage have a strong technical contribution to make (in areas such as computing, for instance).

TT PROJECTS NEED TO BE FIRMLY ADMINISTERED: Care needs to be taken to ensure that TT projects do not suffer from poor follow through by clients from the beginning to the end of a project. Greater incentives and, where possible, promotion opportunities should be made available to those assigned for TT. Personnel need to be released with suitable technical & managerial backgrounds and with sufficient inclination to benefit from TT. Political patronage undermines this process. The encouragement of an attitude to TT that it is a reward for many years' loyal service can often restrict promising talent with leadership potential. Consulting firms usually find it hard to work with host country personnel who come with a "vacation" attitude for a TT placement in their home offices. Clients need to be particularly clear and specific in their requirements when such a TT route is used.

10.5 POLICY FOR AID AGENCIES

CONSULTANTS BENEFIT FROM AID WORK: Apart from bilateral aid provision, consultants particularly value the projects they obtain through the World Bank, ADB, AfDB etc. This allows them security of payment and an opportunity to venture with less risk into new areas, not necessarily in prime favour with the UK government.

AID COORDINATION IS NEEDED AT LOCAL LEVEL: A variety of aid agencies are to be found offering their services to host governments, which can cause a measure of confusion and some squeezing of scarce local resources. Greater planning and synchronisation of projects between aid agencies and host governments are particularly needed in some less developed countries at a local level.

AIDED PROJECT IDEAS AND EVEN-HANDEDNESS ARE MUTUALLY EXCLUSIVE: While aid agencies welcome new ideas for projects, they also need to develop some mechanism whereby they do not always put a proposal out to tender in an effort to

maintain even-handedness. Competition is increased for the very firms who bring them the idea in the first place, which is highly demotivating for the firm; it also restricts the flow of new proposal ideas, which agencies themselves acknowledge to be relevant and well conceived.

INTRODUCE FLEXIBILITY INTO CONSULTING FIRMS' INDIVIDUAL APPOINTMENTS: On many projects the time lag, between a consulting firm's submission of staffing proposals for a project and the eventual go-ahead being given, can be a matter of several months. In this period, a consultant often has to re-assign his staff to another project. Aid agencies could give consideration to being less insistent on the same persona being found for a project and allow the possibility of renegotiation of key individuals in suitable circumstances.

CHAPTER 11

OVERALL VIEW OF THE THESIS

11.0 SUMMARY OF CHAPTER 11

1. The main findings of the thesis are described in brief.
2. Technology transfer projects generate a strong service orientation in firms and influence the overall organisation.
3. Mergers with developing country firms are unlikely to occur due to lack of reliable local experience.
4. The home base is a useful training ground for staff but overseas experience must be gathered abroad for technology transfer work.
5. The steps of internationalisation can be leap frogged with some firms finding clients' own offices an adequate base to locate. The progressive stages of internationalisation and technology transfer provide some matching.
6. Contractors and consultants adopt very different approaches to technology transfer possibly because contractors' services are less intangible and client interaction is required to a lesser extent.
7. Developed markets will need more technology orientation; Eastern Europe should provide opportunities on account of existing aid experience.
8. Construction consultants should find that their competitive edge enhanced through technology transfer projects.
9. Recommendations for future work might involve recently privatised public sector agencies, consultants and technology transfer in developed countries, cultural attitudes in different geographical areas, and an investigation of the extent of repeat order projects involving technology transfer.
10. The random sample examined a range of firms existing in the international construction sector. There were some cases from Canada and Asia; overall some 50 countries' projects were included. While some quantitative comparisons of hypotheses were made, a qualitative approach was preferred in order to emphasise certain aspects of strategy in depth.
11. A different selection might have been used, for instance, for large and medium sized firms and British aided and other projects. A wider spread of projects might have also been included. Appropriateness could have been treated as a distinct issue.

11.1 THE MAIN FINDINGS OF THE THESIS

In construction consulting, technology transfer, consisting mainly of management know-how, is increasingly being required by overseas clients and aid agencies.

Technology transfer changes the organisational structure of a firm, due to a greater need for staff at senior levels, with international experience.

Newly internationalised firms, often medium-sized, can sometimes by-pass the stages of internationalisation by locating directly in client offices on technology transfer projects; while joint ventures occur, the role of established subsidiary offices is diminishing.

Unlike contractors, construction consultants can sustain competitive advantage over time via technology transfer projects; clients can be accessed more effectively at lower cost and market information on new projects can be gleaned more readily.

11.2 CONTRIBUTION OF THE THESIS TO WIDER POLICY ISSUES

Services

The services literature has suggested that many types of firms were repositioning their businesses according to different levels of interaction, customisation and labour intensity. Technology transfer seems to be moving construction consulting firms towards a higher degree of all three of these which is in contrast to the professional services, for instance, of banking and law shown in Figure 3-3. Certainly a much stronger service orientation is required compared to other kinds of project work.

From the point of view of the firm's organisational structure, the pyramid type organisation is not that appropriate. Where technology transfer projects predominate, the pyramid has to be swollen in its middle and upper layers with a much slimmer base. This will have implications for the staffing up of the construction consulting firms in the future as they continue to involve themselves on technology transfer projects.

Internalisation

Ownership and locational advantages, under the eclectic theory, were useful in emphasising important characteristics of construction consulting firms' international business and the issues here seemed to provide a better match than those of internalisation, which were mainly linked to the use of offices and joint ventures. Networks of the firm's own autonomous offices were certainly advantageous from an internalisation perspective for some firms, particularly some of the medium sized to large firms even if the latter were not always using them fully.

Joint ventures continue to be a dominant mode of cooperation with host country consulting firms. Semi-informal associations are observed in some countries who insist upon them but these usually fall short of merger. From the mid-eighties onwards, formal mergers have been taking place amongst many British consulting firms and some American and European consulting firms. It is unlikely however that mergers will take place in developing countries, due to the shortfall of established expertise in many of these local firms. Instead temporary cooperation will continue, sometimes due to pressure from clients, who may insist upon them for "the occasion" of a large project.

In construction consulting, joint ventures provided clear benefits in terms of gaining influence with the client and help in bidding. On the other hand an underlying concern emerged that the local partner might let down badly the incoming international firm. It can be observed here that, like construction contractors, joint ventures do not seem to fit totally within the internalisation framework and there remains a mixture of externalisation and internalisation. This seems to work satisfactorily in practice partly on account of the ad hoc circumstances and limited timescale of most construction projects.

The Homebase

It has been argued that fee competition has been weakening competitiveness because consultants cannot give an in-depth service on home projects in quite the way they could up until the mid-eighties. Instead, construction consulting has had to become

much more price and claims orientated. In spite of this, it emerged that the home base is a useful, almost essential training ground for consulting staff since domestic projects occur in a less turbulent environment when compared to the international scene. A complicating feature of the home base is that consultants' staff are unable to gain overseas experience here; they must gain that abroad. Technology transfer is also not required at home and experience of its actual transfer cannot be gathered there either. This serves to underline the view that domestic and international construction are distinct and different and yet they remain interdependent.

Internationalisation and Technology Transfer

Internationalisation, following the role model shown in Fig 5-1, portrays a firm moving in stages from home office to agent to joint ventures to autonomous local office. However the pattern under technology transfer projects particularly for newer less internationalised firms suggests the steps of agent and joint ventures can be leap frogged. The situation even goes beyond that; due to locational substitutability, the clients' own offices can serve as an adequate base for technology transfer work. Some firms will be content with these restrictions but for others this may not make for a sufficiently independent situation to market for new business so the aim of many firms will still be to establish their own autonomous base for marketing.

Even for some of the large firms the significance of the fully autonomous local office is not as great as it has been regarded in the past. Alternatively, some medium to large sized firms see the local autonomous office as being strategic to their whole internationalisation strategy of moving information, staff know-how and staff themselves across national boundaries. The case studies served to show here there was diversity in the strategic approach. Both were coherent strategies and both could be made to work.

Figure 5-1 has suggested that there is a progression in the technology transfer mode which fits the stages of internationalisation; however any of these modes can actually be adopted. This means that a less internationalised firm will be able to conduct technology transfer in a client's office, toward the end of the line on the internationalisation model, even before it has established its own offices. Equally a well internationalised firm may be using any technology transfer mode including

that of conducting technology transfer in its own home offices and arranging technology transfer in its own home institutions. There appears, thus, to be no clear cut staged progression for technology transfer linked to internationalisation but rather what emerges is a range of possible interchangeable technology transfer options.

Contractors and Consultants

The international presence of British construction consultants is stronger than British contractors in the sense that consultants become better established and stay around longer in countries than their contractor counterparts. The focus, in this study, has been upon technology transfer projects. It has been demonstrated that contractors and consultants regard technology transfer very differently; contractors see little or nothing to gain from them and do not see them as being to their long term or even short term advantage as consultants do. They are not seen either as opportunities for information gathering and contractors do not achieve the kind of client contact, that consultants have to seek to progress their business. Technology transfer for contractors cannot really be regarded as a means to maintain their competitive advantage in international markets, whereas for consultants it certainly can be. This exposes a major difference between the two sides of the industry which is another reason for regarding them as distinct sectors within international construction to be treated differently.

This can be further explained by reflecting on how contractors and consultants differ within the service sector in certain key respects. The services, in which contractors are involved, are not as intangible as consultants. There is also less interaction required with the client. Customisation, while being required, is also decided in advance through the normal contract system. Perhaps this serves to explain why technology transfer is more advantageous for consultants than it is for contractors.

Developed Markets

It has been made clear that developing countries have been the main focus of this study. On the whole, British construction consultants have maintained their market share in these countries, throughout the eighties. The prospect of working

in developed countries could present a very different scenario however. The technology transferred to the latter is likely to include further significant developments in computer aided design and project information management. Actual management experience of the latest projects have been, and will continue to be, regarded as the equivalent for R & D in other industries. It can be expected that recent project experience in the many different disciplines, listed earlier, will continue to confer competitive advantage. The know-how gained here will probably become more technology orientated but it will still depend on the know-how vested in the management resource.

On the edge of the developed European market, Eastern Europe is likely to present increasing opportunities for consulting firms. The contact already gained with Eastern European construction organisations in developing country markets is likely to provide fruitful openings for cooperation, although this will partly depend on how aid money is redistributed to Eastern Europe in the light of the developments that have been taking place in 1990. Consultants should benefit from their extensive experience already gained of aid agencies and aid projects in developing regions.

Technology Transfer and Competitive Advantage

The question remains as to whether competitive advantage can be sustained through technology transfer. The evidence presented in this study has suggested that for various reasons developing countries effectively do not acquire the know-how that is passed on to them either for reasons of accelerated advance elsewhere (in the developed world) or because they do not organise their own staff to be effective recipients of technology transfer. In fact the process at the receiving end often seems to be relatively short lived requiring further inputs in the medium term from the very same firms who were involved before. In such situations there are strong echoes of the "preying mantis" philosophy. This may not hold in those countries possessing a thoroughly developed higher educational sector although the presence of the latter is usually an indication of progress towards a more economically strong self sufficient economy anyway.

Consulting firms should be able to follow a focused strategy leading them to concentrate upon geographical markets and upon particular sector disciplines.

They can differentiate themselves via such focused segments by the way they approach technology transfer projects. A reactive approach should not be followed. Rather firms should be active in interaction with the client in discussing their proposals and seeking to meet clients' own aspirations for technology transfer. Where there is intangibility in their service which makes it difficult for them to convince clients of the merits of this service, they should note that through technology transfer projects their work can become more understandable. This may lead on to greater appreciation from those very clients with whom they seek continued business.

Competitive edge can also be enhanced through technology transfer projects because information on future opportunities can be gleaned at a very early stage, when a project is just a "gleam in the eye". The costs of gathering this information are also reduced which, in a highly competitive market, will continue to be advantageous to construction consulting firms. Technology transfer makes market information gathering more easy, and even where this process is not immediate, it will allow extended contact with client decision makers for many years to come.

11.3 RECOMMENDATIONS FOR FUTURE WORK

The same approach adopted in this thesis with construction consulting firms could be widened to British public sector and recently privatised agencies which contain an international operation. Other developed country nationalities' policies towards technology transfer in consulting could be investigated and then comparisons made with the British sector. The sample within the British sector could also be extended to technology transfer in the developed countries rather than developing countries although this would eclipse the activities of aid agencies and introduce new parties. The current approach could be adopted for a wider selection of contractors and suppliers, possibly taking in more activities of management contractors and turnkey suppliers. Architects and surveyors could also be investigated more widely.

Cultural attitudes to technology transfer projects could be compared in the Far East, Central Asia, Middle East and Africa to determine some of the differences. Groups of middle and lower income countries could also be compared to see what

similarities in technology transfer exist according to the GDP level of certain countries.

In 5 years time it could be worth repeating the study with a similar set of cases to see if there have been any changes for instance in the way that consultants regard technology transfer in the long term.

A part of the early empirical chapter explored the extent of new commissions on home and international projects. This could be widened to determine the extent of repeat orders on technology transfer projects. The activity of aid agencies and other funding sponsors could also be observed more closely by seeing how often aid projects lead to new orders. Projects could be studied for several aid sponsors in turn and comparisons made

11.4 EVALUATION OF METHODOLOGY

Of the 600 or 700 firms described in Appendix A-2, less than 100 consulting firms actually conduct international project work. The sample, selected at random, took account of this range of firms existing in the international consulting sector. Some two or three firms each were selected therefore from the top 10, 15, 25, 50 and 75 consulting firms as listed by overseas staff employed (as displayed in Table 6-2).

Whilst it must be acknowledged that maximum coverage of the UK international consulting sector has not been given, the study has covered a number of representative firms down the spectrum. Furthermore since both large and medium sized firms are able to undertake substantial international projects (including those in technology transfer) it was important for all groups of firms to be included and not just the very largest. Even given that the number of firms used in the study was limited, the number of projects was very much larger extending to more than one hundred in all. A further criticism might be levelled at the study for being confined predominantly to British construction consulting rather than providing greater comparison with competitor nations. Whilst the subject of the study had to be necessarily focused upon British construction consulting, two of the cases were actually Canadian and Singapore based. This represented a useful view from a substantial competitor nation and from a firm based in the developing world.

It can also be noted that the number of countries covered by the projects extended to about 50 in all (see Table 8-1), which further enhanced the international representation of the sample.

A qualitative approach was adopted partly in response to the need for more studies of this type (this had emerged in the international literature review). The emphasis was also of a qualitative nature because it was felt that technology transfer strategy issues could best be explained in depth in this manner. The quantitative approach was limited to a comparison of the support for particular hypotheses among the sample and divisions within the sample. To have pressed for more analysis at this point would not have assisted, it was considered, an adequate explanation of the main issues involved and may even have detracted from the conclusions that could be drawn overall.

It might be argued that a wider sample would provide a greater comparison of some of the trends which emerged under the case study approach. On the basis of the empirical findings in Chapter 5 from the earlier studies involving the author, there may not be any major differences. However, where the findings from the interviews were divided into large and medium sized projects, British aided and other funded etc, these could have been represented by a larger number of interviews.

An extended sample might reveal a smaller involvement from roads, bridges and building disciplines (although these sectors are known to figure prominently in consultants' budgets). Firms volunteered their own projects which they commented upon or used as a frame of reference for their answers to the questionnaire overall. It is the author's view that the sample presented covered a sufficiently representative section of construction consulting to give a balanced picture. However it also might have been possible to offer firms a list of all their international projects over a 5 year period. In this instance it was ruled out because of the sheer information volume in handling so many projects overall. Given the pressures of time in the interview situation, the number of projects which could be covered had to be limited.

Some of the interviews revealed material on "appropriateness" although this subject was omitted from the hypotheses. Testing such a hypothesis would have

provided a further clue, say, on the extent that firms genuinely considered their projects to be suited to their environment. More attention could have been given to client organisations, by contacting former national recipients of technology transfer in order to note any changes that were occurring over the years. This would have been both expensive and time consuming; alternatively this approach could have been limited to a few countries where visits could have been made. However this would have resulted in a sample which was much narrower; the method used had the advantage of covering a wider range of countries.

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APPENDIX A-1

THE PREYING MANTIS

Of all the businesses, by far,
Consultancy's the most bizarre.
For, to the penetrating eye
There's no apparent reason why
With no more assets than a pen
This group of personable men
Can sell to clients more than twice
The same ridiculous advice
Or find, in such a rich profusion,
Problems to fit their own solution.

The strategy that they pursue -
To give advice instead of do -
Keeps their fingers on the pulses
Without recourse to stomach ulcers
And brings them monetary gain
Without a modicum of pain.
The wretched object of their quest
Reduced to cardiac arrest
Is left alone to implement
The asinine report they've sent.
Meanwhile the analysts have gone
Back to client number one
Who desperately needs their aid to tidy up the mess they made.
And on and on - ad infinitum -
The masochistic clients invite 'em
Until the merciful reliever
Invokes the company receiver.
No one really seems to know
The rate at which consultants grow
By some amoeba-like division?
Of chemo-biologic fission?
They clone themselves without an end
Along their exponential trend.

The paradox is each adviser
If he makes his client wiser
Inadvertently destroys
The basis of his future joys.
So does anybody know
Where latter-day consultants go?

"Bertie Ramsbottom" in the Financial Times, April 11, 1981.
with the permission of the author, Ralph Windle.

Source : Turner (82)

APPENDIX A-2

METHODOLOGICAL DETAILS

Sample Selected and Method Adopted (Mansfield 86a)

Some compilation of data was necessary before the consulting engineering sector could be adequately studied. Altogether by 1983 there were upwards of some 600 or 700 Consulting Engineering firms to be considered.

The survey itself was conducted in 1983 with around 30 interviews with consulting engineering firms predominantly in the civil/structural sector. The study was treated as an initial investigation of the sector, related to home issues and international ones. An additional 30 interviews with associated contractor and client organisations tended to confirm the findings arising from the consulting sector alone.

In selecting firms for interviews, attention was paid to the representative geographical distribution of the firm's head office, Scottish and other offices within the UK, more firms being chosen from the larger size end of the scale. The study was backed by a public body with considerable interest in initiating and promoting investment in industry, including construction. After piloting the questionnaire, contact was made with the senior partner or director in charge with whom half the interviews were subsequently conducted; the remainder took place with another partner or person responsible for the area in question. Almost half of the firms derived about a third or more of their business overseas. Firms with little or no overseas workload were interviewed on overseas questions because many were trying or had tried to obtain projects and the difficulties, if any, of such new entrants were considered to be well worth noting.

Sample Selected and Method Adopted in Second Study (Mansfield 88e, 88f))

The construction services sector includes a number of industry participants; consulting engineers, architects, surveyors, contractors and capital goods manufacturers etc. Twenty interviews were carried out with a sample of 20 companies/firms, who were spread throughout the UK.

Consulting Engineers (6) Architects (5) Contractors and Turnkey Operators (5)
Surveyors (2) Capital Goods Manufacturers (2)

The method used to set up the interviews was similar to that used by the author in the first study. An approach was made by letter and subsequent phonecall to the Managing Director or Senior Partner of the organisation in question, with whom one third of the interviews were conducted; the remaining two thirds were carried out with the partner or director or in two cases with a senior manager with direct responsibility for overseas business. Interviews lasted for between one and two and a half hours. In order to obtain the twenty interviews, it was necessary to make twenty two approaches to firms/companies; only two of these declined to be interviewed.

APPENDIX A-3

GLOSSARY OF ABBREVIATIONS

ACE	ASSOCIATION OF CONSULTING ENGINEERS
ACP	AFRICAN, CARIBBEAN AND PACIFIC
ADB	ASIAN DEVELOPMENT BANK
ATDB	AFRICAN DEVELOPMENT BANK
ATP	AID & TRADE PROVISION
BB	BRITISH BUSINESS
BC	BRITISH COUNCIL
BCB	BRITISH CONSULTANTS BUREAU
BIEC	BRITISH INDIVISIBLE EXPORTS COUNCIL
BOTB	BRITISH OVERSEAS TRADE BOARD
CBI	CONFEDERATION OF BRITISH INDUSTRY
CDC	COMMONWEALTH DEVELOPMENT CORPORATION
CIDA	CANADIAN INTERNATIONAL DEVELOPMENT AGENCY (CEDA)
CMEA	COUNCIL for MUTUAL ECONOMIC ASSISTANCE (COMECON)
CSO	CENTRAL STATISTICALLY OFFICE
CV	CURRICULUM VITA
DAC	DEVELOPMENT AID COMMITTEE
DACON	DATA ON CONSULTANTS
DANIDA	DANISH INTERNATIONAL DEVELOPMENT AGENCY
DOE	DEPARTMENT OF ENVIRONMENT
DTI	DEPARTMENT OF TRADE AND INDUSTRY
EAP	ECONOMICALLY ACTIVE POPULATION
ECGD	EXPORT CREDIT GUARANTEES DEPARTMENT
EDF	EUROPEAN DEVELOPMENT FUND
EEC	EUROPEAN ECONOMIC COMMUNITY
EIS	EXPORT INTELLIGENCE SERVICE
ENR	ENGINEERING NEWS RECORD
FDI	FOREIGN DIRECT INVESTMENT
FIDIC	FEDERATION INTERNATIONALE DES INGENIEURS CONSEILS
FT	FINANCIAL TIMES
GCF	GROSS CAPITAL FORMATION
GDP	GROSS DOMESTIC PRODUCTION
GFCF	GROSS FIXED CAPITAL FORMATION
GNP	GROSS NATIONAL PRODUCT
HMSO	HER MAJESTY'S STATIONERY OFFICE
IAESTE	INTERNATIONAL ASSOCIATION FOR THE EXCHANGE OF STUDENTS' TECHNICAL EXPERIENCE
IBRD	INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT
IDA	INTERNATIONAL DEVELOPMENT AGENCY
IFC	INTERNATIONAL FINANCE CORPORATION
ILO	INTERNATIONAL LABOUR ORGANISATION
IMF	INTERNATIONAL MONETARY FUND
ITI	IAN TESSLER INTERNATIONAL
JV	JOINT VENTURE
LDC	LESS DEVELOPED COUNTRY
MNE	MULTINATIONAL ENTERPRISE
NCE	NEW CIVIL ENGINEER
NEDO	NATIONAL ECONOMIC DEVELOPMENT COUNCIL

NIC	NEWLY INDUSTRIALISED COUNTRY
NORAD	NORTH AMERICAN AIR DEFENCE
ODA	OFFICIAL DEVELOPMENT ASSISTANCE
ODA	OVERSEAS DEVELOPMENT ADMINISTRATION
OECD	ORGANISATION FOR ECONOMIC DEVELOPMENT AND COOPERATION
OLI	OWNERSHIP, LOCATIONAL AND INTERNALISATION
OPB	OVERSEAS PROJECT BOARD
OPEC	ORGANISATION FOR PETROLEUM EXPORTING COUNTRIES
R & D	RESEARCH AND DEVELOPMENT
TT	TECHNOLOGY TRANSFER
UK	UNITED KINGDOM
UN	UNITED NATIONS
UNDP	UNITED NATIONS DEVELOPMENT PROGRAMME
UNIDO	UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANISATION
UNESCO	UNITED NATIONS EDUCATIONAL SCIENTIFIC AND CULTURAL ORGANISATION
USA	UNITED STATES OF AMERICA
WB	WORLD BANK
WHO	WORLD HEALTH ORGANISATION

APPENDIX A-4

QUESTIONNAIRE relating to TECHNOLOGY TRANSFER on OVERSEAS PROJECTS as related to CONSTRUCTION CONSULTING FIRMS in THE DEVELOPING WORLD

NATURE AND EXTENT OF TECHNOLOGY TRANSFER

- 1) To what extent does technology transfer appear on projects that your firm undertakes?
- 2) Is technology transfer usually covered as a distinct part of a project and budgeted separately?
- 3) Technology transfer schemes involve not so much the transfer of technology but the transfer of management "know-how" forming part of the total project system; the actual "technology" being transferred is relatively secondary. How far do you agree?
- 4) How is technology/know-how part of the project usually divided?
- 5) How would you describe the technology that your firm is required to transfer?
- 6) When "know-how transfer" does appear on projects, in which your firm is directly involved, what form does it usually take?
- 7) Could you describe THREE examples of projects where your firm has been involved on technology transfer projects in the last five years?....
- 8) To what extent do you find that technology transfer is no longer optional but rather mandatory on projects, undertaken by your firm? Describe according to separate continents as necessary.
- 9) What was the situation 5 years ago/10 years ago?
- 10) Does the pressure to become involved in "technology transfer" come primarily from the financial sponsoring authority (i.e. Aid Agency etc.), the developing country client or your own firm itself?
- 11) In what ways does this "pressure" usually express itself?
- 12) Have you experienced conflicts between the requirements of the aid agencies & financial sponsors and those of the client governments? Describe.
- 13) Has your firm usually found clients to be sufficiently specific as to their own requirements for technology transfer projects?

- 14) In how many cases have their own requests for particular approaches meant that the transfer that did take place was insufficiently appropriate or unsuitable to the main needs of the client (as you actually perceived them)? Describe.
- 15) In what way has any inappropriateness of the transfer been due to your own firm's approach? Describe.
- 16) Have you had experience of agencies and host governments tending to follow over-rigid rules, with regard to age limits of your staff, in such a way that the best blend of expertise is not able to be provided to suit the needs of projects? Describe.
- 17) In how many cases have host country governments, in your experience, put forward the wrong sections of their own management for training on technology transfer projects? Describe.
- 18) Does the manner of budgeting ever adversely influence the priority that is actually given to technology transfer compared to other aspects of productive work? Describe.

TYPES OF PROJECT & FIRM

- 19) How far is the kind of technology transfer related very particularly to the region where it is needed or do the same processes apply equally across all countries?
- 20) Are there some projects that your firm undertakes which involve more of the process of technology transfer than others? Describe.
- 21) Which types of technology transfer project are the most successful in leading to long term relationships with clients?
Routine/Attention/Cerebral.
- 22) How is this relationship advantageous to you in terms of the depth of the relationships built up with the client?
- 23) Are "complex"/"long-life"/"frequently-ordered" projects particularly advantageous to you in terms of the relationship built up with the client?
Are there "other" categories?
- 24) How is this advantageous to you in the long term?
- 25) How would you describe your firm in the area of its main undertakings:
Strong Idea/Strong Service/Strong Delivery?
Specialist/Multi-specialist/Product(Sector)/Problem-Solving

- 26) How would you describe your firm in the area of its technology transfer projects:
- Strong Idea/Strong Service/Strong Delivery?
- Specialist/Multi-specialist/Product(Sector)/Problem-Solving
- 27) Given that there is some difference in emphasis between your main undertakings and your technology transfer work, what repercussions does this have in the organisation of your firm?
- 28) What kinds of strategic (or fundamental) reorganisation have been taking place within your firm in response to the demands of technology transfer?
- 29) To what extent has the technology transfer element in projects led to a shift in the staff requirements within your own firm? Describe.
- 30) In technology transfer projects, are different ages of staff needed according to the nature of the experience required by the project type? Can you give examples?
- 31) Are the needs of the market in technology transfer moving your firm to become more Strong Idea/Strong Service/Strong Delivery?
- 32) Is it your policy to train from within or to recruit from outside for the middle to senior management positions on technology transfer projects in your firm? If so why?
- 33) Do you have project business in one area and technology transfer work in another? Describe.
- 34) In your view, can "technology transfer specialists" set up in business, as such, or does it have to be a spin-off from something else. (i.e. the firm's mainstream business expertise)?
- 35) Has your firm sought to manage a technology transfer project which has been on the periphery of your mainstream experience?
- 36) In such a situation, to what extent is the transfer process any more complicated than the more usual (mainstream business) projects that your carry out?
- 37) Are medium-sized firms on account of their size and flexibility better able to carry out technology transfer? How does this manifest itself?
- 38) Do medium sized firms tend to transfer more straightforward technology? If so, why?

COOPERATIVE ARRANGEMENTS AND OVERSEAS REPRESENTATION

- 39) In pursuing overseas work do you usually seek to:-
Go alone/Go in a consortia of UK firms/Go in a joint venture of developed country firms/Go in a joint venture with a local host country operation/ or Go in a joint venture with developed and developing country partners.
- 40) Why do you follow the above patterns?
- 41) In undertaking technology transfer arrangements, does your firm cooperate with other types of organisation via joint ventures and consortia etc? If so, why?
- 42) With which sort of organisations, does your firm find it necessary to cooperate?
- 43) In your experience are other British construction groups (contractors etc.) as much in evidence in the developing world overseas as consulting engineers?
- 44) Does this lead your firm to work with other nationalities in preference to British firms?
- 45) What types of joint ventures/consortia provide the most favourable conditions for technology transfer between your firm and host country organisations?
- 46) On what basis do you usually decide on the joint venture arrangement and its partners?
- 47) In what ways do joint ventures restrict or enhance the effectiveness of the process of technology transfer?
- 48) In your experience has technology transfer come to be linked with arrangement of finance, and sharing in ownership?
- 49) Has your firm experienced any difficulties setting up such arrangements? Describe.
- 50) How important is it to have well integrated subsidiary offices to conduct technology transfer business?
- 51) How necessary is it to have well integrated subsidiary offices to obtain technology transfer business?
- 52) How far does effective technology transfer take place for foreign national employees within your subsidiary offices?
- 53) In your view is technology transfer best conducted in the host country within a project environment, rather than in the home country?
- 54) What proportion of partners/directors in your overseas subsidiary offices are foreign nationals?

- 55) Of your total staff numbers (worldwide), what proportion are non-British nationals?
- 56) What kind of cooperation is there worldwide between your firm's subsidiary offices? For instance are the profits reported and distributed across each of your regional operations? Please describe generally.

LONG TERM IMPLICATIONS

- 57) Do you consider that technology transfer projects are a long term business investment for your firm?
- 58) Do you consider that most client organisations are naturally suspicious of long term relationships with single firms? How is this displayed?
- 59) To what extent are technology transfer projects a short-term approach to overseas business, leading to self-sufficiency for the client?
- 60) How far is it a defensive mechanism on your part for conducting business in the host country, because you see no other alternative?
- 61) How far do technology transfer projects enhance your firm's reputation?
- 62) In view of developing countries' aspirations for self-determination, how far do you see technology transfer as bringing this about?
- 63) What tends to militate against this taking place, in practice?
- 64) How does your firm rate the financial benefit obtained directly from the technology transfer part of projects?
- 65) Via the technology transfer stage, is it more or less possible to establish greater interaction with the client than through the other stages of feasibility, design & supervision?
- 66) In what ways do technology transfer projects improve the possibilities for hearing about further work?
- 67) Can market information on forthcoming projects be gathered in a way that is more in-depth and effective than is possible through other means? Describe.
- 68) Could you describe three examples where this has occurred?
- 69) How far can long term relationships develop through technology transfer projects leading to clients coming back to the firm for more work?
- 70) How much has the process of technology transfer allowed your firm the opportunity for further guidance of the client, including education as to the full service that your firm offers?

- 71) How far has your firm found the technology transfer project to be a suitable medium for entering a market?
- 72) How is this different to normal ways of entering markets?
- 73) How far has your firm found the technology transfer project to be suitable for extending business in existing country areas into different market areas?
- 74) Does the carrying out of projects involving arranging finance and participation in ownership lead to further opportunities for business? If so, how does this occur?
- 75) By cooperating with more nationality groups does this in turn open up more opportunity for extra business in different parts of the World, than would otherwise be available to the British sector? Can you give instances?

APPENDIX A-5

KEY TO HYPOTHESES DESCRIPTION

(for Appendix A-6, A-7, A-8)

CONSULTANTS	a
CLIENT ORGS & AID AGENCIES	b
CONTRACTORS & CG MANFRS	c
CONSULTANTS, CLIENT ORGS & AID AGENCIES	m
TOTAL (ALL)	q
LARGE FIRM SIZE	d
MEDIUM FIRM SIZE	e
BUSINESS OVERSEAS (More than half)	f
BUSINESS OVERSEAS (Less than half)	g
LARGE SIZE OF PROJECT	h
MEDIUM SIZE OF PROJECT	j
TT IN CLIENT OFFICES & OTHERS	k
TT IN OTHER OFFICES	l
BRITISH AID FUNDED	n
OTHER AID, PRIVATE & GOVT FUNDED	p
AFRICA	r
ASIA	s
ROADS & BRIDGES DISCIPLINES	t
ALL OTHER DISCIPLINES	u

Source : Author's Interviews

APPENDIX A-6

LEVEL OF SUPPORT FOR ALL HYPOTHESES (FIRM TYPE)

	a CONS 1-12	b CLIENT & AID 13-14	c CNTR & SPLRS 15-16	m (a+b) 1-14	q ALL FIRMS 1-16
N1	95	100	83	96	94
N2a	50	50	100	50	59
N2b	30	67	50	38	41
N3	60	67	50	62	59
T1	75	100	100	81	83
T2	65	80	33	68	61
T3	95	80	100	92	93
T4	35	67	0	40	32
A1	60	67	67	62	63
A2	87	100	67	89	86
A3a	65	67	33	65	59
A3b	11	0	17	08	10
M1a	90	50	33	80	72
M1b	47	50	25	48	44
M2	75	100	67	80	77
M3	74	100	40	83	73

Source : Author's Interviews

APPENDIX A-7

LEVEL OF SUPPORT FOR ALL HYPOTHESES (CONSULTING FIRMS)

	d	e	f	g	h	j	k	l	n	p
	FIRM SIZE		%OVERSEAS		PROJECT SIZE		TT LOCATION		FUNDING TYPE	
	L	M	>1/2	<1/2	L	M	CLNT	OTHR	BRIT	OTHR
N1	90	100	91	100	100	89	100	92	88	100
N2a	50	50	82	11	67	44	38	58	50	50
N2b	50	10	27	33	27	33	13	42	25	33
N3	60	60	55	67	55	67	63	58	75	50
T1	71	78	89	57	67	86	67	80	67	80
T2	80	50	64	67	55	78	63	67	63	67
T3	89	100	91	100	100	89	100	92	100	91
T4	33	38	33	38	33	38	67	18	33	36
A1	60	60	82	33	55	67	50	67	55	58
A2	100	75	88	86	100	71	67	100	80	90
A3a	60	70	64	67	73	56	50	75	63	67
A3b	11	11	09	14	20	0	17	08	25	0
M1a	90	90	82	100	82	100	100	83	88	92
M1b	38	60	36	62	10	89	75	27	57	42
M2	80	70	82	67	73	78	75	75	75	75
M3	67	80	73	75	60	89	71	75	85	67

Source : Author's Interviews

APPENDIX A-8

LEVEL OF SUPPORT FOR ALL HYPOTHESES (ALL FIRMS)

	7		8	
	r	s	t	u
	GEOGRAPHICAL AREA		PROJECT DISCIPLINE	
	AFRICA	ASIA	ROAD & BRIDGES	OTHER
N1	88	100	94	93
N2a	71	47	47	73
N2b	41	40	41	40
N3	53	67	76	53
T1	82	85	77	91
T2	53	71	75	47
T3	94	92	93	93
T4	20	50	50	15
A1	59	67	59	67
A2	91	82	83	90
A3a	65	53	63	56
A3b	13	07	06	17
M1a	71	73	82	60
M1b	40	50	60	25
M2	71	86	81	73
M3	63	86	88	57

Source : Author's Interviews

Some international issues from the early 1980s facing British consulting engineers

N. R. MANSFIELD, BSc, MBA, MICE, MIHT, MIWES, MAPM, MBIM

This Paper discusses the activities overseas of a section of British consulting engineering. After an initial review of their worldwide position, it highlights some of the reasons why many firms have been successful in obtaining a high proportion of overseas work and sets out critical factors which have limited international progress, particularly on the part of the small to medium-sized firms. The findings formed part of a wider study of the construction industry. This included over 60 interviews in Scotland and throughout the UK with consulting engineers, contractors and clients with activities in the civil/structural sector.

Background to consulting engineering sector

Britain has the second largest consulting engineering grouping in the world after the USA, in terms of international commissions received, and over the years has taken a significant market share for construction work in each of the developing areas of the Middle East, Africa and Asia.¹

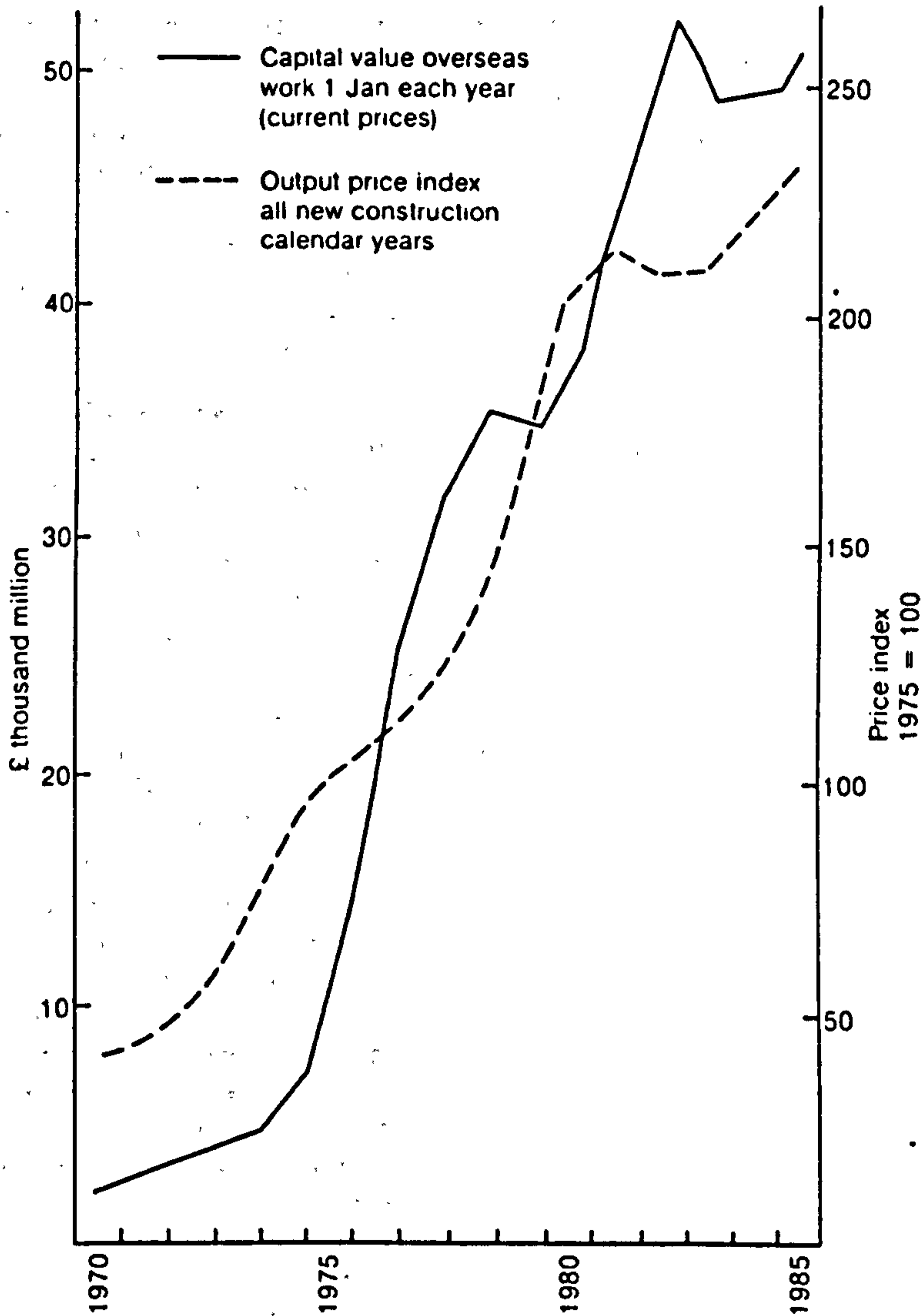
2. Throughout the 1970s major contributions were made by the sector to Britain's invisible earnings. Between 1970 and 1980 world trade grew by 17% per year in real terms for services compared with 6% per year for merchandise trade.² As part of this, *British Business* quotes³ the annual Department of the Environment survey which recorded that British architects, consulting engineers and chartered surveyors had won orders in nearly every area of the world, with a number of companies winning the Queen's Award for Export.

3. Figures released from the Government Statistical Office indicated that British consultants' invisible earnings rose by 12% to £880 million in 1982 with the majority, £565 million, coming from consulting engineers, an increase of 16% on the previous year. There are signs of a plateau being reached, however. Latest figures for 1985 give invisible earnings at £562 million, much on a par with 1983's £561 million. In their annual review, 'Overseas work entrusted to members', the Association of Consulting Engineers reveal⁴ that the capital value of works on hand in 1985 rose to £51.3 billion from £49.5 billion in 1984, still below the peak of £53 billion in 1982 but still ahead of that which might be suggested by the Price Index (see Fig. 1). Some of this fall-off was undoubtedly due to slower spending by the OPEC countries in the Middle East,⁵ where British consulting engineers have about two-fifths of their business,¹ but it may also be due to increased skill on the part of overseas competitors in obtaining new work.

Ordinary meeting, 5.30 p.m., 17 March 1987. Written discussion closes 31 March 1987; for further details see p. ii.

* Department of Civil Engineering, University of Strathclyde.

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Source: Association of Consulting Engineers⁴
 Department of Environment^{6,9}
 Hillebrandt¹⁰

Fig. 1. Total estimated capital values of overseas work in hand by ACE members compared with price index

Position of British consulting in the world; geographical areas of activity

4. The top 200 design firms in the world and their activities abroad are listed in a survey conducted annually in *Engineering News Record*.^{1,11} Of all foreign commissions obtained worldwide by consultancy firms from the United Kingdom in 1983, the Middle East accounted for a third, Africa a quarter, Asia a fifth and Latin America a tenth.

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5. Britain's major international competitor was the USA followed by West Germany, France, Holland, Italy, Scandinavia and Canada. The market share of each country varied according to the continent selected but for each of these other countries it was rarely more than 10%. In Africa, however, British, French and American consulting engineers all took about a fifth of the market. The British share was greater in Asia and slightly less in the Middle East. There has traditionally been poor representation in South America where the USA has more easily dominated the market, due to its geographical proximity. In Asia there was a growing threat from the Japanese. Japan's market share in 1982 held steady at 9% but in 1983 it rose to 11%.^{1,11}

Viewpoint of British firms

6. Hillebrandt¹⁰ considered that British consulting engineers probably earned three-quarters of their fee income from overseas, this being obtained by well over one hundred practices of consulting engineers engaged in export work in a number of countries. Close analysis of the annual *New Civil Engineer*^{12,13} survey suggests that Hillebrandt's figure may be rather high. The top 100 firms (with over 50 employed) had on average about half of their business overseas, although this proportion as represented by staff employed dropped by about 5% between 1980 and 1985. Most medium-sized firms have an involvement overseas amounting to about a quarter of their total business. For the top 25 firms the overseas share was nearer two-thirds, with up to seven of the larger firms having 85% of their work abroad. In 1982, the British Overseas Trade Board and Barclays Bank co-operated with the British Consultants Bureau to commission a report entitled 'Success in invisibles' which sampled a selection of firms within the UK, including consulting engineers, architects, property developers and others.² This highlighted many current problems faced by professional firms when operating overseas. For instance the talent and expertise applied to the marketing of professional services was described as very limited at present. While a high standard of technical expertise was clearly necessary, it was cited that increasing attention needed to be given to management and marketing skills. The selection of a suitable geographical area (and a country within that area) and the need to enter a market quickly, or curtail activities in another place, were all pressing matters affecting the firm's strategic planning. Furthermore, firms faced a dilemma on whether to continue to compete on a wide front of broad-based activities, or whether to become more involved in selective specialist work.²

Considerations from overseas competitors

7. Both Bidgood¹⁴ and Cohen¹⁵ have given much practical advice from the 1970s on the work of consulting engineers overseas from the British and American viewpoint. The activities of Swedish consulting engineers were reviewed by Gardborn and Rhenman,¹⁶ when various options for their industry were discussed. Mention was made of the situation in Holland, Norway, Japan and the UK. Such a comparative review was most useful and informative at the time the study was made. For instance, different combinations of groupings were used: the Dutch with both public and private sectors and the Norwegians with small-sized firms.

Survey results—characteristics of overseas work and general issues

Justification for survey approach

8. FIDIC, through its regular seminar proceedings, disseminates the viewpoints of member consulting engineers worldwide on current issues.¹⁷ Although

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overall aggregative figures are published year by year by the Association of Consulting Engineers, the British Consultants Bureau and the Department of the Environment, there has been limited information available, apart from that already mentioned, on the performance of the consulting engineering sector at the level of the individual firm.

9. British contracting overseas tends to be dominated by a small number of large companies but this is less so in the consulting engineering sector.¹⁰ In order to build up a more detailed picture than was available from the limited official data, a survey was undertaken involving personal interviews with a selection of individual consulting firms. Interviews were conducted with large, medium and small-sized firms with head offices distributed throughout the UK, and in many cases with substantial international involvement. Methodological details are presented in Appendix 1.

10. Reddaway¹⁸ in his government report on consulting engineers costs' and earnings classified 'over 250 employed' as a large firm and '25-250' as a medium-sized firm, with a small firm being anything below 25. The same classification has provided a reasonable framework for the description of 'large' and 'medium-sized' firms as used here.

Reasons for consulting engineers going overseas

11. Van der Meer¹⁹ focused attention on the role of international aid agencies in financing and initiating projects and Minch²⁰ subsequently indicated that 40% of the World Bank's budget is spent on construction projects. Given some of the pressures on consulting engineers to pursue work abroad, it is not surprising to find that many firms, who were interviewed on the survey, went overseas because they saw greater potential. Overseas work was useful as a means of providing work for staff thereby making the firm less dependent on a reducing UK market. Foreign projects enhanced the image of the firm in the eyes of clients worldwide. For some it was a logical progression to take up the invitation overseas of UK architects with whom they had already worked in the UK.

12. With certain funding being available only overseas^{19,20} and with so many other nations benefitting from foreign commissions it would be surprising if British firms were not also participating. In fact Britain was well represented as has been stated in §§ 1-3.¹ A number of firms saw overseas work as both a good opportunity and a means of increasing the size of their organization; others had gone abroad because they were keen to make maximum use of the sound experience they had already built up at home.

Staff levels

13. Considering first some of the basic characteristics of the sample, it was found that firms had reduced their staff numbers by 14% on average over the five years to 1983. Those firms with greater proportions of overseas work fared slightly better (down 12%) than those with lower proportions overseas (down 17%) (see Fig. 2). By contrast in the NCE survey, both these groups of firms had apparently held their numbers steady; over a five year period there was a small drop of 1% only in each group.^{12,13} There was thus a clear discrepancy between the two surveys. In the latter, unless there was a considerable drop or increase in numbers employed, it is possible there could be a tendency for firms to keep recording in the same range from year to year.

Size of firm and range of disciplines

14. The size of firm, as reflected by the numbers employed, has been drawn up

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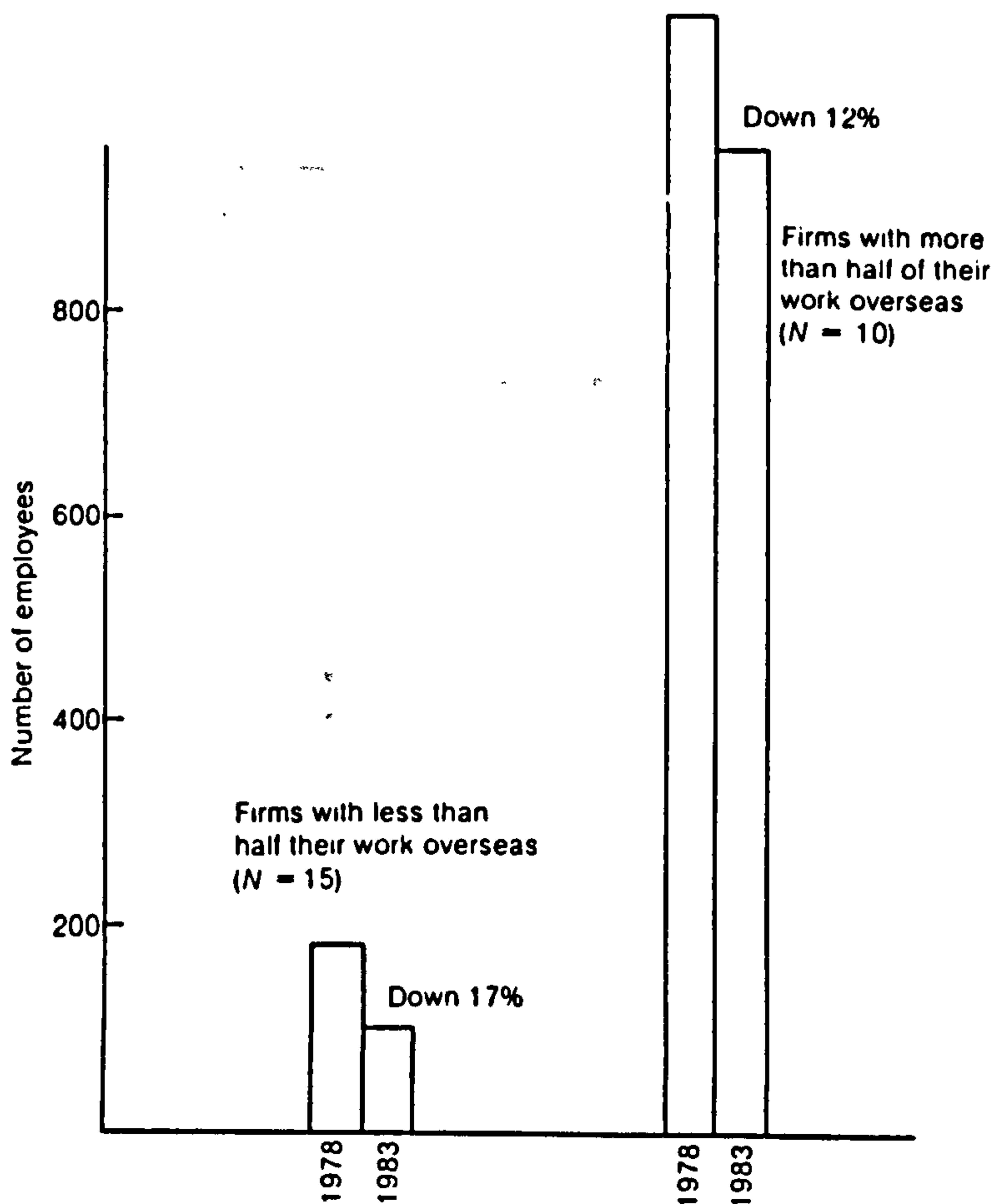


Fig. 2. Employment in firms—source: study interviews

against the proportion of the firm's work overseas (Fig. 3). There was reasonable agreement between the *NCE* survey and the study that firms began to take off as international firms once they reached the 250 employed mark, the point at which Reddaway classified a consulting firm as large. There are large firms with low proportions of overseas work and medium-sized firms with high proportions of work overseas but these are the exception rather than the rule.

15. The range of disciplines offered by those firms with large proportions of overseas work was marginally wider than for those firms with low percentages overseas. There was a clearer relationship between the size of firm and the range of disciplines offered (see Fig. 4 and Table 1). This did not mean, however, that medium-sized firms restricted the disciplines offered. In both the *NCE* survey and the study itself, some of them appeared to be almost as wide as the larger firms, as can be seen.

Geographical location overseas

16. The most popular area of work was the Middle East where 8 out of 10 firms had a presence (see Table 2). Two-thirds of the firms had activities in Asia and this was equally true of Africa. Other continental areas were represented to a

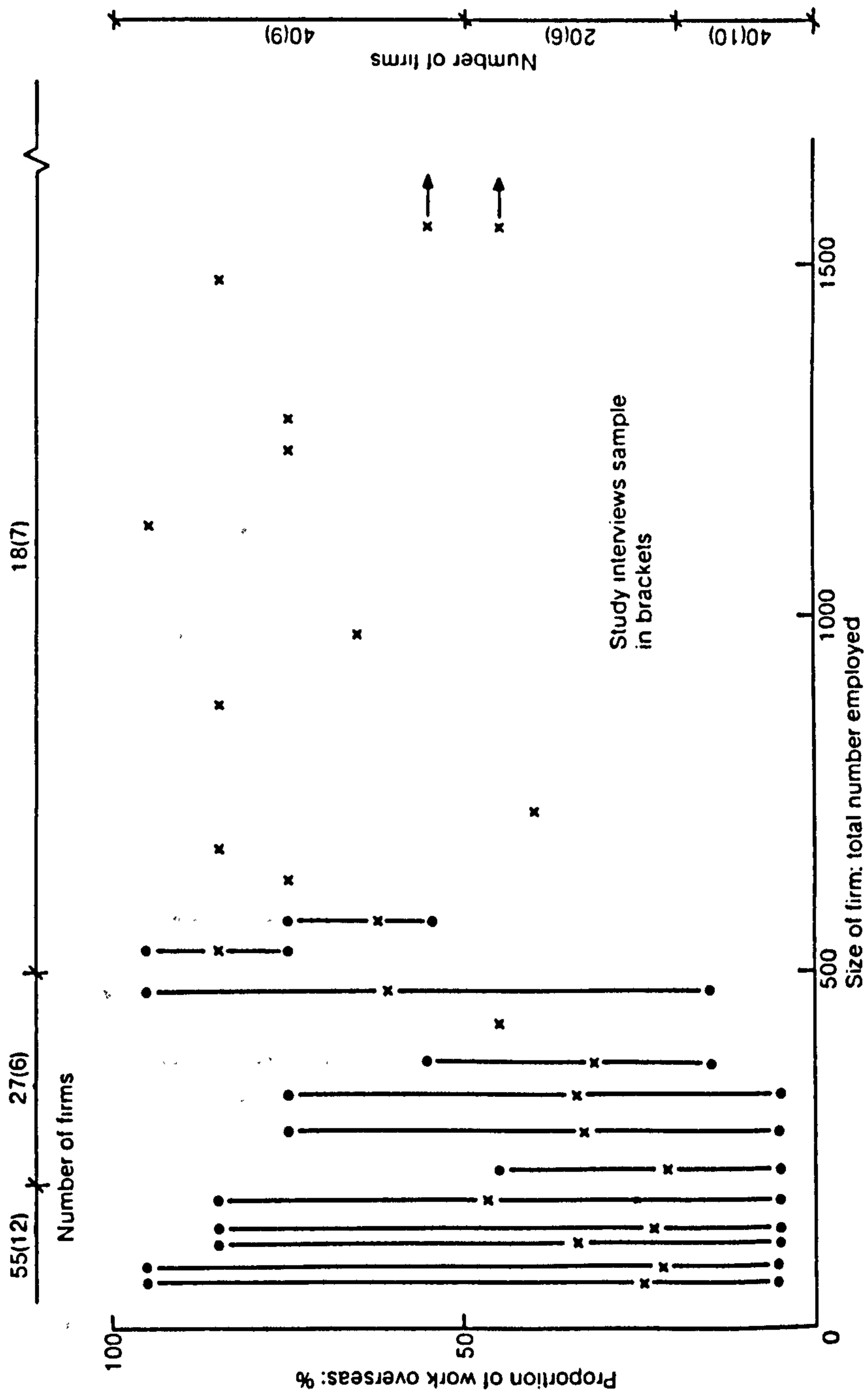


Fig. 3. Proportion of overseas work by size of firm—source: NCE survey 1984²¹ (average x)

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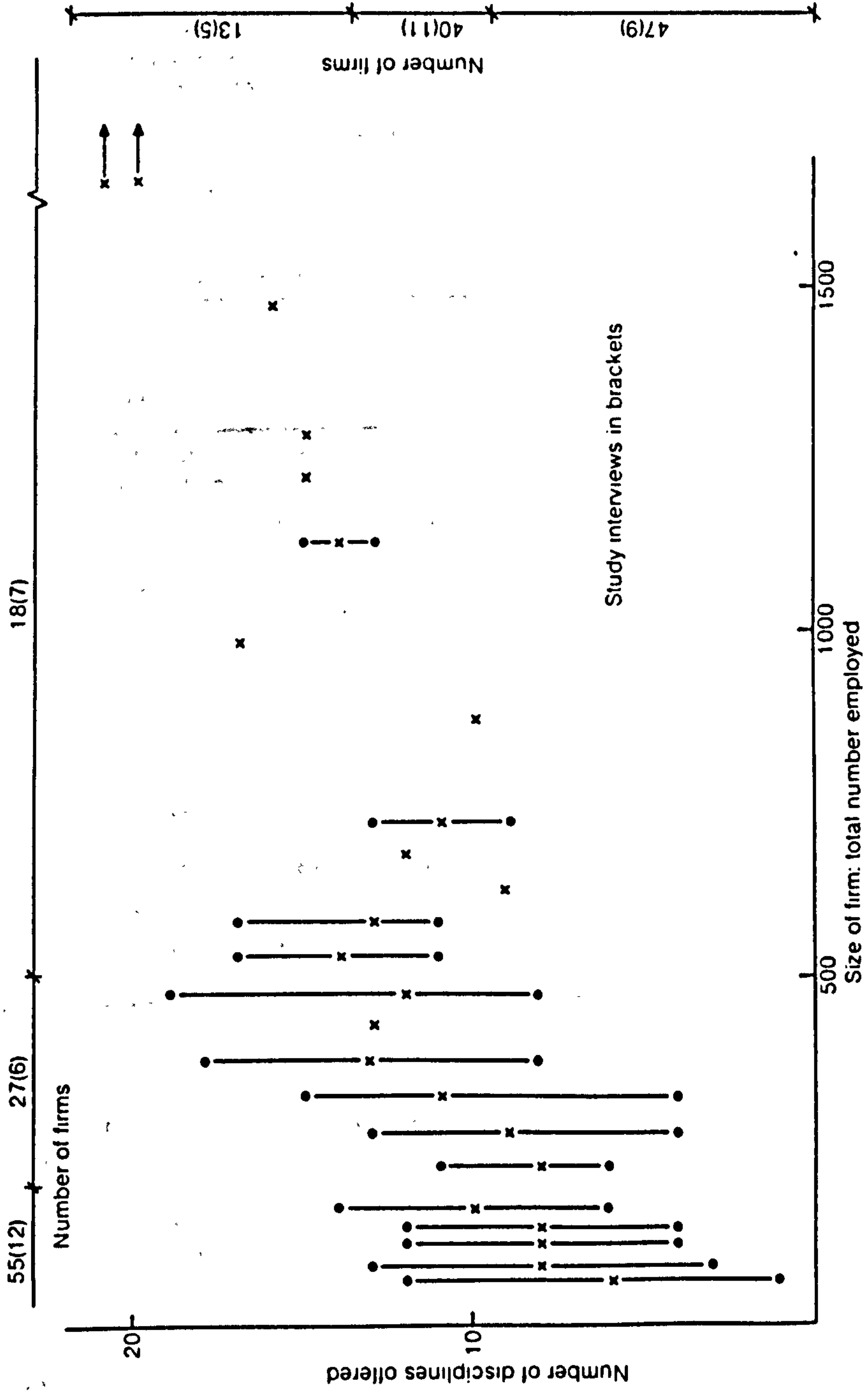


Fig. 4. Number of disciplines related to size of firm—source: NCE survey 1984²¹ (average x)

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Table 1. Disciplines,* indicated by types of work undertaken

Airports	Mining metallurgy
Building services	Pipelines
Chemical engineering	Railways
Drainage and sewerage	Roads and bridges
Electrical engineering	Solid waste treatment
Energy planning and conservation	Structures
Geotechnical and ground engineering	Thermal and nuclear power stations
Harbours and docks	Transport planning
Hydroelectric work	Tunnelling
Irrigation	Underwater and offshore engineering
Mechanical engineering	Water supply

* Note: Classification as adopted in NCE Survey. 12.13.21

Table 2. World areas of firms' activity*

Partial abbreviation	Continental area	Number of firms		%	Continent
WE	Western Europe	9	9	43	Europe
EE	Eastern Europe	3			
ME	Middle East	18	18	86	Middle East
SA	Southern Asia	10	14	67	Asia
FE	Far East	12			
A	Australia	8	8	38	Australia
NAf	North Africa	10	14	67	Africa
WA	West Africa	12			
EA	East Africa	8			
SAf	South Africa	4			
NAm	North America	5	5	24	North America
CAM	Central America	7	7	33	Central America and Caribbean
SAm	South America	7	7	33	South America

* Number of firms contributing N = 21.
Source: study interviews.

lesser degree, the poorest showing being Latin America where only one in three firms had associations worth recording. This was not dissimilar to the findings of the ENR survey of top companies. It was interesting to note that in spite of just under half the firms claiming a presence in Continental Europe, actual commissions received in the EEC were on average as low as 2% of total business.

Client orientation.

17. According to Table 3 and Fig. 5, the extent to which firms depended on existing clients for work in the UK was high. This was more marked where larger contracts are concerned. Overseas, there was a far greater incidence of new clients. In fact it was the major source of business. Management contractors, contractors and other consulting engineers were more common providers of work overseas

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than in the UK. In these cases, the latter organizations were acting for the client in a lead capacity.

Home and overseas workloads: a balance to be found

18. A more subjective note was struck by asking firms their desired preference for the ratio of home to overseas work. Some of the medium-sized companies searched for overseas work but appeared to be content if the home overseas ratio settled at 80:20. Others who were facing substantial cuts in home workloads wanted more overseas work and were happy if it rose to as much as half, and this desired equality between home and overseas business was also evident among the large enterprises.

19. A variety of reasons were given for the wisdom of maintaining a substantial home workload. A home base was needed to train staff, particularly younger engineers and project managers. According to one firm: 'home projects had the advantage of providing contractually and organizationally stable situations'. Some overseas clients were insisting on professionally qualified staff which implied that graduate civil engineering staff for the first five years of their working lives would have to be employed on home projects. There was no doubt that overseas projects made heavy demands on the firm in terms of the large number of highly paid senior staff that were required. A complicating factor was that these staff were not always fully occupied— for example, in the period prior to the clinching of a contract. However, if sufficient home work was available of the right kind, staff on overseas projects in the home office could be absorbed satisfactorily. Even when senior staff were fully involved overseas, it was necessary to allow them to recuperate through a period of work in their own home environment at regular intervals: one large firm was setting out to implement this by assigning such staff, for a period, to a secondary UK office away from the metropolitan setting.

Keys to success and failure

20. Table 4 summarizes the factors influencing success and failure. By its very nature, consulting engineering is a highly labour or staff intensive business. This has been supported by Reddaway, who found that slightly more than half the costs of consulting engineering were attributable to payroll and staff salaries.¹⁸ The product being marketed overseas, as in the UK, is essentially that of professional services for construction works. Initial selection for a project is highly dependent on the prospective client's own perception of the quality of the staff who can be assigned to the project by the consulting engineer. Maloney²² has stressed the importance of interpersonal qualities in international construction. It is not surprising, therefore, that in the study, staffing emerged as an important factor contributing strongly to success. Staff had to be well suited and thoroughly committed to the task, usually displayed by a willingness to become closely involved with the client over a long period. One firm particularly emphasized that this had to occur at partner level.

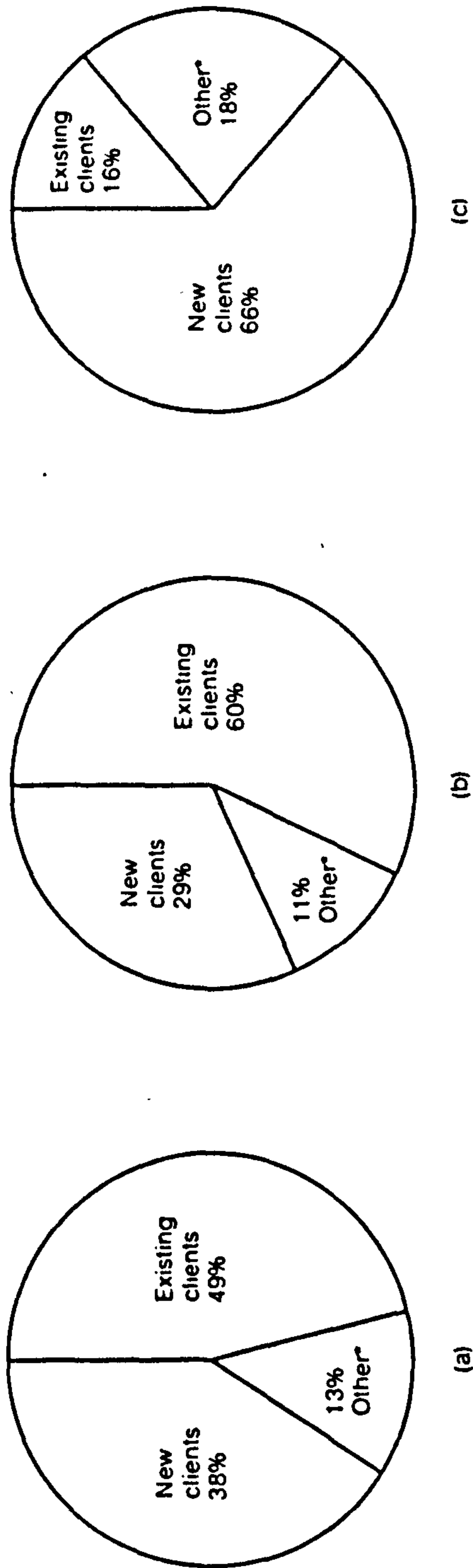
21. Good connections made in the past were seen as most important in clinching overseas work. A good local agent in the country of operation, who had proved himself in the past, was clearly a great asset. Most firms stated that a satisfactory track record was another crucial factor in marketing their services to prospective clients. On reflection, however, some felt that the work they had landed was closely linked to the substantial investment that had already been made by the firm overseas, or the large amount of work around at the time in the

Table 3. Types of client according to home and overseas contracts

Firm number	UK contracts up to £5 million			UK contracts over £5 million			Overseas		
	New clients	Existing clients	Other*	New clients	Existing clients	Other*	New clients	Existing clients	Other*
1	100						40	30	30
2	50	25	25	20	60	20	100		
3	25	75	—	45	35	20	100		
4	50	30	20	40	60				
5	30	60	10				90	10	
6	60	20	20						
7	25	50	25				10	60	30
8	—	—	—				10		15
9	25	75	—				85		
10	40	40	20	55	40	5			
11	40	50	10						
12	30	65	5						
13	10	50	40	5	80	15	40	40	100
14	20	80	—	15	75	10	90		20
15	80	20	—	20	70	10	50	40	10
16	35	50	15						
17	15	60	25				90	10	
18	20	80	—						
Sample number	655	830	215	200	420	80	795	190	215
	17	17	17	7	7	7	12	12	12
	38.5	48.8	12.7	28.6	60	11.4	66.3	15.8	17.9
	38%	49%	13%	29%	60%	11%	66%	16%	18%

* For definition of Other see Fig. 5.
Source: study interviews.

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*Other = work through management contractors, consulting engineers or another pattern

Source. Study interviews See also Table 3

Fig. 5. Type of client, according to home and overseas contracts (a) UK contracts up to £5 million (N = 17); (b) UK contract over £5 million (N = 7); (c) overseas (N = 12)

Table 4. Keys to success and failure overseas

Success due to	Failure due to
<p>(a) Well suited and thoroughly committed staff (b) Close involvement with client at the highest level (c) Good connections from past (d) Good local agent (e) Satisfactory track record (f) Substantial volume of work available worldwide</p>	<p>(a) Poor local agent* (b) Delay in satisfying local registration* (c) Competitors better sellerst (d) Lack of formal plan (e) Underestimated scope of task</p>

* Medium-sized firms.

† Larger firms.

Source: study interviews.

Table 5. Benefits and disadvantages of overseas work

<p>Benefits*</p> <p>Firm's standards improved Greater technical competence achieved Job satisfaction for staff Prestige for firm Useful staff kept employed Financial turnover increased Projects obtained with larger size and longer duration Balancing effect on overall workload Greater opportunity and profitability</p> <p>Disadvantages</p> <p>Heavy front end investments Large overheads</p>	<p>Late payment Currency exchange complications Higher margins necessary High risk business Political upheaval Greater chance of failure Client misunderstands nature of service offered Much time spent travelling Wear and tear on individual senior staff Hard to find right calibre of staff No fixed fee scale and 'free for all' Undercutting by competitors Some unscrupulous clients</p>
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* Source: study interviews.

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countries where they were looking.

22. Some firms had been disappointed in their overseas aspirations, particularly the medium-sized enterprises. This was put down to either a poor local agent (in direct contrast to an earlier finding) or to delay in being able to satisfy the local registration requirements. Some large firms were losing out to allegedly technically inferior firms who, irritatingly enough, were 'better sellers'. Others honestly admitted they had gone overseas in the early days without any formal plan or that they had very much underestimated the scope of the task.

Benefits and disadvantages of overseas work

23. As might be expected the actual benefits ascribed to overseas work (see Table 5) were closely linked to the reasons given by the firms for going overseas in the first place. Some indicated that standards could be developed through the greater variety of work available overseas. Firms became more technically competent because some work rarely occurred now in the UK; for instance construction of new ports. Job satisfaction was usually increased for all staff and prestige for the firm resulted from the more interesting work on hand. Staff liked going abroad because they were better rewarded and had the opportunity of travel. From the company's viewpoint valuable staff were 'kept employed and kept together within the organization. Financial turnover could be maintained at a higher level, since overseas projects were larger in value and longer in duration. This had the beneficial effect of balancing out the frequent peaks and troughs arising from a solely UK dependent workload. Certainly more opportunities presented themselves overseas and profitability, admittedly a function of risk, was usually greater than in the UK.

24. The disadvantages cited in conducting overseas work were found to be an extension of some of the negative factors already described. A heavy investment was required at the beginning of a project because of large overheads, due to the nature of the work and the geographical separation from the UK. Recuperation of this outlay was invariably delayed by late payments, difficulties over currency exchange rates or an inability to transfer funds back to the UK. Margins had to remain high for profitability to be assured. It was evident that a wide range of experience was needed to operate effectively overseas and this was not acquired quickly.

25. Overseas work was considered to be a high-risk business, with added political complications in some countries. Many of the smaller medium-sized firms were reluctant to launch into overseas work in too committed a fashion because a great proportion of the firm's resources would be put in jeopardy. It was also believed that there was far greater risk of a large contract going 'badly wrong' overseas as compared to a similar project in the UK.

26. In a few cases clients were finding it difficult to understand the nature of the services being offered to them by consulting engineers. In many countries the idea of a fixed fee scale could not be entertained. One firm considered that some overseas clients were becoming more unscrupulous. At the same time, undercutting by competitors was much in evidence.

27. Other disadvantages arose as a result of a project's location. Much time had to be spent travelling, which took its toll on the individuals concerned. Some firms declared it was far from easy to find the right calibre of personal to place overseas particularly for medium or long-term assignments, although one company thought that recession in the UK was easing the situation.

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Survey results—problems and opportunities

Current difficulties

28. Firms were then asked to comment on the difficulties they experienced in remaining in the overseas market (see Table 6). Competition was considered to be stepping up, particularly from developing countries who were able to provide their own engineers more cheaply in some technical areas. Some firms found that clients were increasingly stipulating that their own national engineers be employed to work alongside the consulting engineer and this gave considerable concern.

29. Many competitors undertook the work, primarily it appeared, as a means of gaining foreign exchange, and allegedly enjoyed more support from their own home governments. There was considerable support for the view that the Export Credit Guarantees Department (ECGD) should provide more favourable terms of cover for British enterprises. Smaller medium-sized firms said they could not afford to have senior personnel touring the world looking for work and that aggressive marketing overseas was expensive. The desire to thrust out overseas was not helped by the need felt by some companies to consolidate at home.

30. Finding a suitable contractor presented difficulties in certain quarters, especially where projects were technically complex. Corruption provided complications in a few cases, and was clearly a more pressing issue in some countries rather than others.

New problems emerging; future opportunities

31. New problems considered likely to emerge in the future were that too many enterprises were dependent on traditional markets, notably the Middle East (see Table 2), and growth was required in fresh areas. There was evidence of work drying up in a number of countries. This was supported by the earlier reference that host countries were undertaking more work themselves and that overall demand for construction worldwide might be levelling off.

32. Opportunities in the future were believed to lie in French-speaking areas in some cases. Others saw the correct packaging of their service as an important factor. One large consulting engineer considered that 'joint ventures would occur through consortia with other British firms or through British contractors taking the lead in providing an attractive financial package to the client.' One medium-sized firm in the sample thought the future must lie with large firms 'who would continue to do well overseas because they had the advantage of size and proven experience'.

33. Another company considered that future projects overseas could become

*Table 6. Current difficulties overseas**

Competition increasing particularly from developing countries
Host government national engineers cheaper
Client stipulation that national engineers work alongside
Competitor countries undertaking work for foreign exchange
Unfavourable terms of cover for British firms by ECGD
Aggressive marketing overseas expensive
Necessary to consolidate at home to survive
Lack of availability of suitable contractors for complex work
Corruption ramifications

* Source: study interviews.

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gap-plugging or that future success would lie in the provision of a set of specialist services; but in regard to the latter few firms volunteered to identify any service on offer that was markedly different from that of their competitors.

34. It was considered that British diplomatic services could provide better assistance than they were doing at present. One firm noted that when help had been requested from a British Embassy in a French-speaking area, the reply lacked any kind of commercial urgency and this rendered the assistance of little use. A number of firms pointed out that the European Development Fund quota for British contractors had been well below target. Under-usage of this quota by contractors suggested a future opportunity for consulting engineers if the rules could be adjusted in their favour. Other companies considered that British aid should be allocated in a more advantageous manner to the greater benefit of UK firms. There was further mention of such increasingly successful competitors as Japan, Korea and Russia where backing was far better orchestrated by their own governments.

Changing patterns of conducting work

35. Changes were occurring in the ways that firms were obtaining work. Clients in the past who had usually invited one consulting engineer only to conduct feasibility followed by design were now more likely to be calling for competitive tenders based on price or a lump sum bid. One large firm suggested that 'competitive packages might be offered to other clients through co-financing arrangements with merchant banks, partly provided by the funding agencies' and that 'there was a tendency for aid donors from other countries to give through the International Development Agency (IDA) and make more use of tied bilateral aid arrangements, thus reducing the market for British firms'.

36. Some firms envisaged there would be a greater involvement on the part of contractors and management contractors who might increasingly take the lead through management contracts and joint ventures with consulting engineers.

Survey results—links, overseas

37. It is well known that many firms, especially the larger ones, market themselves as international organizations with a good spread of offices world-wide. In doing so they are likely to become involved with a local agent and at times with a local consulting engineer in the country of operation. Apart from a local office being impressive to clients, some countries insist on a truly local office incorporating local partners as well. Part of the survey concentrated on these issues.

Overseas offices

38. A small number of firms said either they would definitely not open an office ahead of a project or conversely that opening an office showed a clear commitment to the area. The majority said that an office was normally a straight offshoot of a project already obtained in a country. The main disincentive with establishing offices was the long time-lag sometimes required between first opening and the subsequent landing of a commission. High initial outlays and accumulating overheads could not permit speculative offices to continue much beyond 2 or 3 years.

Role of overseas agent and local consulting engineer

39. To enhance the possibility of securing overseas work, business links involving a commercial sharing were often formed in the country of operation but

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usually these would be temporary. Several companies confirmed that in many countries a local agent was a built-in requirement for obtaining any work at all. The precise role of the agent varied greatly from country to country. Local consulting engineers within the host country were sometimes the instrument with whom work was shared. On occasions this was mandatory. Benefits from a project could be split half and half, although local input was sometimes nominal.

40. It was observed that firms had evolved three different methods of selection for an overseas agent in the host country. One method was to select an agent through a government sponsored trade mission or through the contacts of the embassy attaché. A second was to work through a local company with whom the firm had previously worked in a different part of the world. A third method was simply to establish contact through the specific visits of the partner or representative concerned. As far as was possible the agent's commercial and political connections would be assessed along with such important qualities as drive, personality and integrity. It was usually up to the UK representative of the firm, in the area at the time, to make the appropriate selection and this was not an easy matter. It was noted that two medium-sized companies had closed down their operations overseas mainly due to a lack of proper understanding with the local agent. One agent 'failed to produce any work at all', and another 'conducted work in such an unbusinesslike manner that connections had to be severed.'

42. As regards local consulting engineers, some firms were more enthusiastic about them than others, and saw them as possessors of local know-how with whom it was also useful to share bread-and-butter work. Smaller UK enterprises in the early stages of penetration overseas found that their connection with local firms was a satisfactory way of conducting work. However, the decision on the actual inclusion of a local consulting engineer was noted to vary from project to project even within any one country.

Conclusions for consulting engineers

Overall view

43. Within the consulting engineering sector as a whole there appeared to be an aura of acceptability about working overseas. The larger firms were not unaware of the major difficulties; the longer they had been in the overseas business, the better it seemed they were able to deal with them. In some cases new entrants, particularly those at the smaller end of the size scale were finding overseas work a quantum leap.

Marketing of services

44. The interview survey indicated that there was a need felt by some consulting engineers to allocate more resources so as to represent themselves better in the eyes of overseas clients (this was also supported by the ITI report). Some firms in the study had assigned a partner in the firm to this kind of activity as a priority task, but the emphasis, in most firms, was comparatively low key. Critics of this view may argue that a low-profile approach will always be appropriate to consulting engineering in the UK even though it is acknowledged that a more active approach overseas may well be a necessary concomitant to success.

45. The study was not particularly successful in revealing any great future opportunities partly, it might be argued, because firms would tend to keep better ideas to themselves. In any event some British expertise will have to be initiated and developed overseas, irrespective of activity at home, if present levels of foreign

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work are to continue. Clients are likely to be much more interested in the application of new technology as far as it affects the construction industry; this might be encompassed within the provision of a particular set of specialist services, as envisaged by Parish.⁵ While the small to medium-sized firms may consider that they will benefit from this type of overseas project, the survey has already demonstrated that there are special problems for this size of firm in coping with the roles and activities required of overseas work.

Indigenization and technology transfer

46. Many firms alluded to the process of indigenization that was taking place in some of the countries in which they were working. Starr has indicated that between 15 and 20% of a project's engineering services budget could be reasonably allocated to technology transfer, with 40 to 50% of this being assigned to on-the-job training during the project.²³ Some American²⁴ and British²³ consulting engineers have been engaged in this kind of scheme for some time. As suggested by Abbott²⁵ and supported by recent FIDIC conference reports, this could increasingly become the way of conducting future business with government clients from developing countries.^{17,26} Most firms have limited experience of bidding for overseas commissions with this kind of package included. With projects running into millions of pounds, even a small proportion of a construction project represents a sizeable budget for technology (or know-how) transfer schemes.

Large organizational consortia

47. In direct contrast to the earlier mention of specialist services to suit a particular segment of the overseas market, is the formation of large consortia with a wide spread of experience to offer the client. In recent years, British consulting engineers have formed ad hoc joint ventures to meet particular project opportunities and throughout the world this continues. Part of the key to future success undoubtedly lies in the correct packaging of organizational consortia which enhances the product on offer. There were certainly signs of changing patterns emerging for conducting work.

48. In line with the report of the Overseas Projects Board²⁷ greater involvement is to be expected from contractors in co-operation with consulting engineers.

Small medium-sized firms

49. It has been suggested that a firm needs to have an establishment of at least 250 employed to be able to operate as a thoroughly international firm. The number of companies involved in the medium-sized category, according to a recent *NCE* survey, is about 60 plus (that is, for those between 50 and 250 employed). On average a quarter to a third of this group's workload is overseas, with half of the firms having little or no overseas work at all; many are regionally based. Many of them have similar difficulties and a number could well be on the threshold of greater penetration overseas if some of the obstacles could be removed.

50. Due to the high costs of pursuing work overseas there appear to be clear advantages in a selection of the smaller medium-sized firms grouping themselves into small consortia of their own, possibly based on their local regional centres. The best arrangements would likely be where each firm complements the other's skills and disciplines. The establishment of similar organizations not unlike Nor-

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consult may provide a good opportunity. Whether or not this is an area where government can act as a catalyst is uncertain it may be. There are other areas where government can bring influence to bear and some of these are introduced next.

Conclusions for government policy

Weak front at home

51. Many observers of the export scene would expect the share of a firm's business overseas to increase as home orders fell away. Surprisingly this is not suggested by analysis of the recent *NCE* survey. While not to be depended upon for exact figures, this survey recorded an apparent downward trend in the proportion of the staff employed on overseas work.

52. To be noted by any Government is that the level of overseas work can be affected once home workloads are reduced beyond a certain point. Many firms reiterated the comments of one smaller medium-sized firm that 'consolidation was now necessary at home'. Even some of the larger enterprises with very high proportions of overseas work were beginning to register a slightly lower share. Certainly the interviews with the larger international firms confirmed that they leaned towards a higher proportion of home work.

Trade assistance

53. There were frequent references, in the interviews, to the Export Credit Guarantees Department (ECGD) and the need for a reform of its services. This organization has been examined closely in a government report since the survey was first undertaken.²⁸ Although stiffer premiums have resulted (particularly for work in countries in Latin America with large international debts) it will be interesting to see whether more helpful changes are forthcoming. For non-London based firms one area requiring attention would appear to be the improved dispensing of the services of the ECGD, and also of the Department of Trade export department in regional areas away from central London. British embassies overseas could be useful providers of information on local trading contacts and also on future projects in their domains. To be considered, however, is how diplomatic staff resources at their present levels and with their present training could make such a service effective.

54. One theme of the Lamb Report was the need for co-operation across different branches of British industry.²⁹ It was evident that the link-up with the overseas host country agent, whether temporary or permanent, was of major concern. Any changes in Foreign Office policy which helps the arrangement of good trading links abroad across industry interests would doubtless be welcomed by many firms in the consulting sector, particularly the smaller medium-sized enterprises or any firms who are moving into a new area of influence overseas. On the other hand, some of the more established international firms might argue that a regularizing of their links overseas would restrict their initiatives, and possibly sap the profitability of the operations if bureaucratic interference arose.

Aid policy

55. There are many obstacles for firms in the smaller to medium-sized range. The policy, until late of providing British aid funding for those projects most likely to enhance orders for UK manufacturing industry, has been called into question and needs further rethinking. Perhaps a slight change of emphasis has been signal-

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led recently, as evidenced by a much higher proportion of small firms receiving the 1985 Queen's Award for Export.³⁰ Running parallel to this is the possibility that in the 1980s the number of very large projects could be reducing worldwide. At least one medium-sized consulting firm, with a good foothold in Africa, has argued that they could compete with the larger consulting firms on an equal footing for the medium range of projects, and as often as not obtain the commission. This same firm would be penalized by the government policy of aiding the larger project for its share of manufacturing content.

56. Several of the sample companies took up the aid theme, pointing out that their competitors had governments which openly sponsored them or that such governments had an aid policy which was organized more bilaterally so that orders would naturally flow back to the donor country. Not unnaturally most of the firms surveyed were in favour of aid being given with at least some strings attached.

57. There must at times always be a certain ambivalence about aid distribution. On the one hand, it can be a free handout, and on the other it is an offer of funding conditional upon substantial expenditure in the home country. There is considerable grassroots support for both of these polarized views. Since some British competitors have recently been offering clients soft loans with lengthy payback periods rather than grants, this may increasingly become a more popular option for the British Government too. Certainly in 1985 the Aid and Trade Provision (ATP) has been expanded to help companies match concessionary financing terms offered by other countries.³¹

Private and public sector co-operation

58. In 1979/80, the government demonstrated its early intention of benefitting the private sector by privatizing the Road Construction Units (or RCUs), thereby releasing home work to a dozen consulting firms. Although such organizations as Transmark have for many years successfully exported (railway) expertise overseas, there is still much technical and project know-how tied up within the public sector which has not seen the light of overseas opportunity. The government might very well consider taking further initiatives in other construction sectors, by encouraging the combination of private and public sector experience as has been done in Holland. This does not necessarily mean privatization. Both public and private sectors could remain intact in their separate arenas at home, but they would be free to co-operate jointly overseas. The initiative for this would not necessarily come, in the first instance, from the private sector but such a step could benefit the UK economy as a whole, and is therefore worthy of the government's serious consideration.

Further investigation

59. There is a good argument for mounting a study with a wider selection of consulting firms on more specific international issues.^{32,33} Foreign competitors from the developed and developing world are overcoming many barriers which are not likely to be exclusive to themselves alone. Future systematic study of all these competitors' approaches to their business could only help the UK consulting industry to operate more effectively overseas.

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60. Grateful acknowledgements are given to the Scottish Development

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Appendix. Sample selected and method adopted

61. Some compilation of data was necessary before the consulting engineering sector could be adequately studied. Altogether in 1983 there were upwards of some 600 or 700 consulting engineering firms to be considered. The survey itself was conducted with around 30 interviews with consulting engineering firms predominantly in the civil/structural sector. The study was treated as an initial investigation of the sector, related to home issues and international ones. An additional 30 interviews with associated contractor and client organizations tended to confirm the findings arising from the consulting sector alone.

62. In selecting firms for interviews, attention was paid to the representative geographical distribution of the firm's head office, Scottish and other offices within the UK, more firms being chosen from the larger size end of the scale. The study was backed by a public body with considerable interest in initiating and promoting investment in industry, including construction. After piloting the questionnaire, contact was made with the senior partner or director in charge with whom half the interviews were subsequently conducted; the remainder took place with another partner or person responsible for the area in question. Almost half of the firms derived about a third or more of their business overseas. Firms with little or no overseas workload were interviewed on overseas questions because many were trying or had tried to obtain projects and the difficulties if any of such new entrants were considered to be well worth noting.

Some international issues from the early 1980s facing British consulting engineers

N. R. Mansfield

Mr Mansfield

For the capital works overseas on hand for Consulting Engineers, Fig. 1 has been updated (Fig. 6). This includes information published early in 1987, which revises the overall position. There has been a crossover on the graph for capital works overseas on hand and the price index. A similar downturn occurred in 1979 and there were upturns in 1977 and 1981. Even given the sharp drops from £51.3 to £43.4 billion in capital works and the fall in invisible earnings from £562 to £508 billion, there could be upturns again. The position of consulting engineers in the UK also has to be interpreted in the light of what is happening in the world as a whole.

64. Technology and know-how transfer schemes continue to be a matter of interest both in the future and at present. The question has to be raised whether consulting engineers really find this arrangement working to their business commercial benefit and whether better long-term links with clients are formed as a result of this kind of work. It is possible that some small to medium sized firms might be able to carve out their own attractive market niches in this area.

65. The Overseas Project Board have written a further concise report³⁶ which explains many of the provisions of aid packages and loans. A correct understanding of these provisions is crucial to operating effectively overseas as is the ability to put together a package which must be more attractive to the client than any competitor can offer. The ATP seeks to plug the gaps here and match foreign competition.

DISCUSSION

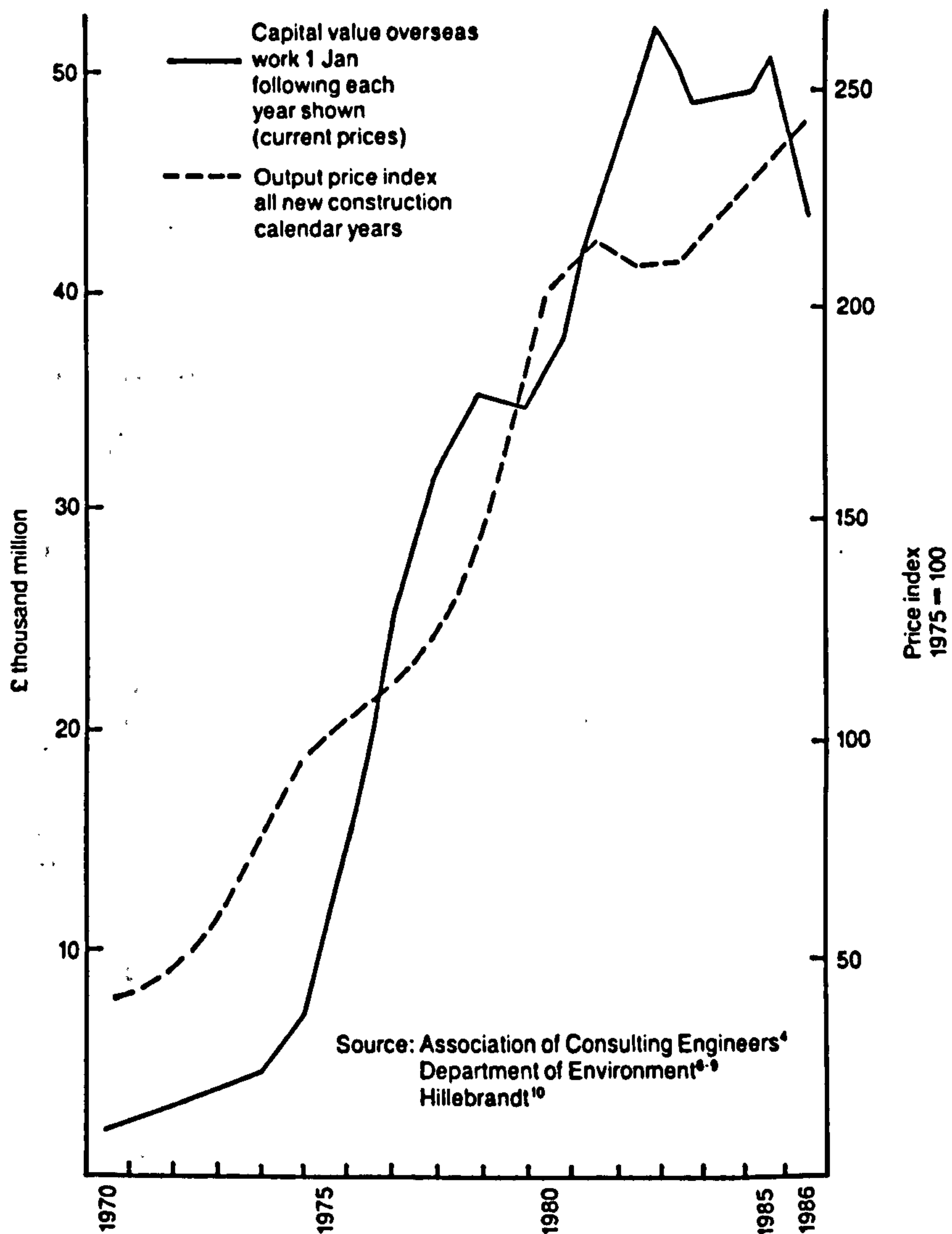


Fig. 6. Total estimated capital values of overseas work in hand by ACE members compared with price index, updated

price in early 1986 put the UK at a disadvantage. What was until February 1986 a stable market in the Gulf turned out to be not so stable, the effects in the UK being felt most in Scotland. The oil price drop adds to the factors that are already increasing competition for work for all engineers from the UK overseas.

Mr Mansfield

A cost-benefit analysis on the loss of trade resulting from increasing overseas students fees would be interesting to carry out but it might take a decade and a half to chart. It would certainly appear that UK Education Ministries' policies on overseas students has not formed part of any integrated policy on British overseas trade. Overseas students policy in the early 1980s has been short-term. It is clear that a longer term policy is needed combining both trade and overseas students if expected benefits are to be clawed back, even 15 or 20 years from now.

100. Many consulting engineering and other construction industry companies continue, it seems, to find difficulty in breaking into Europe and have very low involvement in Europe in terms of workloads,³⁷ although there are a few exceptions. The general pattern depicted is that competition in most developed countries is very stiff because of an experienced local construction sector. The client may also prefer firms with offices and senior staff near to their own offices who can be relied on to be familiar with that country's standards and procedures. One instance where this pattern appears to have been broken is where project management services have been offered, involving design and full vetting and supervision of suppliers across European national boundaries. Two other instances occurred—where work was also coming from a European client first encountered in the UK who had further work to be done back in Europe and where a British client had a project in Europe. Very few useful leads were being picked up as a result of direct visits to EEC offices in Brussels and it was felt that little seemed to come quickly from government to government representations. Investigations are being carried out into the way that Spanish companies might enter Europe through previous working relationships in Latin America with other European countries' firms.³⁸ The introductions are made in the developing world and joint ventures or subcontracts are sought in Europe itself. The same might also be applicable for British consulting engineers and they may also look to that route as part of their strategy.

101. With regard to the sizes of firms and fluctuations in staff, there may be some reluctance, on the part of respondents, to record each year's changes in staff levels in the NCE Consultants file annual survey³⁹ but several annual returns should pick up major shifts accurately enough. This survey has the advantage of including both ACE and non ACE member firms and companies, both limited and unlimited.

102. Views have been exchanged in the engineering press in 1985-87 on whether the idea of marketing, in anything more than an informal sense, is something that consulting engineers should seriously consider. However, it needs to be said that if marketing exists it will be distinct from the marketing of consumer products or of industrial goods. Essentially it is the marketing of services which is needed and this is different again from consumer services.⁴⁰ Engineers need to be introduced to this and made more aware of it earlier in their careers so that the

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market becomes some part of their education as does the technical side. Various consulting engineering firms are now proceeding along the lines of more formal business development functions; the way this is organized varies according to the firm itself and according to the firm's size.

103. In some of the developing countries of Central America, as in South East Asia, it is true that engineers are often thrust too quickly into administrative positions and there is a dearth of the kind of UK experience that is obtained in the first 10–15 years of an engineer's career. When know-how transfer is mentioned it often includes the in-depth engineering experience but also the procedural and management content of projects. Joint ventures and co-operation with local consulting engineering firms form a necessary part of this process and these have their own pitfalls. Armitt (1985) made a useful summary of the problems facing contractors involved in joint ventures.⁴¹ International business literature does not lack comment either, as for instance in reference 42.

104. In future the way in which packages are put together—including the technology transfer aspect—will affect the total offer that the consulting firm will make in competition with others. The offer may be seen to be better because of a superior technology (or know-how) transfer and training element included.

105. It is interesting to note the calculation of 'British arithmetic' whereby several British firms have found it to be favourable to compete on what would appear to be unwise bidding against each other. They have met the client's requirement for a reasonable list of suitable firms and avoided competing against other nationalities unnecessarily. Other countries with their organized group approach also benefit when individual firms within the group take it in turns to bid on successive projects. This is the other side of the 'arithmetic' coin; the former arrangement offers more variety and still preserves impartiality and independence but at some cost. Both methods are successful in obtaining commissions.

106. There is little hard information recorded on the numbers of lists of competitors in any given market. Several firms have indicated that they do not bid if they know a particular country is also bidding because a very low price would have to be put in to secure the project. Sometimes the nationality of the opposition is a deciding factor in proceeding past the first stage. Some firms also have had a policy of being very geographically concentrated in certain countries and have been able to obtain repeat orders, and also negotiate commissions and contracts. Clients have come back to them because they had a good working relationship—presumably these clients were unthreatened by accusations of graft from other influential parties within that same country.

107. It would appear that consulting engineers need to expand continually on the range of disciplines that they offer in addition to those listed in Table 1. These extras may be described to be within the orbit of economists, financiers, geographers, physicists and agriculturalists. Some would argue that these skills have and are being brought together as the occasion demands it. However, more emphasis may need to be placed on such additional expertise if firms are going to be able to win work satisfactorily. More than a multidisciplinary engineering approach is called for here. When consulting engineers enter the realms of what would appear to be the skills of others what they are in fact showing is the proven ability to manage the overall operation. If they do not provide the overall management then some other organization will do so. Any such other organization may not be in the best position to provide the right kind of leadership. Two other important characteristics of the lead firm must also be an ability to plug in to a

sufficient amount of financial sourcing as well as possessing a strong relationship with the client.

108. The crunch still occurs with finding the organization who will put up the money for the scheme. At some point the ODA, the World Bank, some other aid agency or a private funding sponsor has to be convinced that there is a viable project to be financed. Aid agencies might still question whether the money should be spent in some other territory unless the allocation is specifically for that country, in which case there is competition with other projects. From studies in the consulting sector it is highly desirable for single firms to be in discussions with aid agencies at the very earliest conceptual stage before the project is hardly even an idea. They are then more likely to be favoured as successive stages unfold.

109. The possibility of a consortium as one strategy for small to medium sized firms has to be considered. Working with a larger consulting firm may appear to be one of the more promising routes but recent work has suggested that very little work is likely to be passed on by the larger firm to the smaller ones. When it is passed on it is on the basis of a particular specialism which is not found within the larger organization. It may also be passed on if there is a shortage of resources at the time. Some bread and butter work may be subconsulted for reasons of cost or convenience, particularly when its content is reasonably straightforward.

110. A loose consortium of like sized small firms may be a second option. One of the problems that can occur here is in the division of work. There is also the question of the balance of intelligence coming into the consortium from each individual firm and how much it is fair to expect equal sharing among the parties. Most small or medium sized firms have a strong preference for total independence, as do the larger firms; they began that way. There is therefore a strong inclination towards 'going it alone'. Such firms would do well to look across to Scandinavia where there have been more developments in successful co-operation. However, some of this might have to be put down to their culture which lends itself more to working in groups. It could also be due to a tacit acceptance that the domestic market allows few opportunities for expansion and a group effort is imperative overseas, given the size of many Scandinavian consulting firms.

111. This aside, British consulting engineers in the small to medium sized category might do well to consider a fairly loose arrangement which contains an active list of firms who are available and prepared to involve themselves on occasions. This involvement would depend on the skills called for and the geographical location of the project (as well as other factors such as who the client is, which other firms are going to be involved, what the firm's current workload is, and what the expected margins might be). Firms could then come together for particular projects. Complementarity of skills would most likely be evident with one firm taking the lead in a dominant capacity.

112. With regard to the Overseas Project Fund (OPF) for feasibility studies and the MEGS for opening new overseas offices, it appears that the latter was useful and did help some firms to get established although some other firms inevitably did not find their applications granted, even when they had put forward a good case (for instance in seeking to set up in a part of nordic Europe). Improvements in the OPF that might be suggested involve funds for feasibility studies being given out for smaller sizes of projects. The present threshold is too high and it assumes a healthy goods item will be brought back to UK's manufacturing industry. The present preoccupation with very large projects is unlikely to be helpful to more than a few firms. The range needs to be broadened and this can be

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done best by lowering the thresholds. For the ATP, the number of companies able to tap into this scheme seems to be extremely small. It appears to be government policy to match competition and go on expanding ATP although it has to be observed whether this will be at the expense of other instruments.

113. Further investigations³⁷ suggests that upwards of about one third of projects obtained by consulting engineers might be put down to direct targetting of the market. The remainder arise from apparently out-of-the-blue approaches to the firm which are themselves the product of many factors, such as a local office in the country or the network of relationships that the firm has established in many different quarters over some years. The picture is not dissimilar for architects but for contractors the picture tends to be reversed. One route to overseas operations for small to medium sized consulting firms is to undertake work for British-based clients on almost a sub-consulting arrangement. The risks of overexposure are less using this route, partly because the initial search overseas for work is eliminated.

114. As regards British aid, it seems to be allocated in a rather spasmodic fashion at various times in the year. It appears to be difficult for some established consulting firms to break into this area and get on to active selection lists. Where British aid awards have been achieved, it has greatly assisted some consulting firms in building up a presence in a new territory at a far lower cost than would be the case with the opening of a speculative office. Funds recently withdrawn from the MEGS might usefully be channelled instead into a more diffuse number of British aid projects.

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THE USE OF ADVANCE INFORMATION IN THE CONCEPTION STAGES OF
INTERNATIONAL CONSTRUCTION PROJECTS ----- NIGEL MANSFIELD

ABSTRACT: Information sharing was found to occur across firms in the construction sector and relationships between them were regarded as important in obtaining successful contracts. The average tender success rate was 1 in 10; non-competitive price was the main reason cited for lack of success, followed by inadequate track record abroad, lack of connections and political factors. The proportion of work passed on to other companies varied with the sector group.

INTRODUCTION

Faced with a declining workload in domestic terms or merely seeking expansion of their organisations, many construction firms and companies turn their attention to the prospect of the international market. On the one side, they are faced with the structure of the international construction industry, with its great variety in types of projects and in funding sources, and all the accompanying information related to construction made available throughout the world [1] [2] ; on the other side is the firm's actual awareness and effective usage of such market information and the cooperation that may be exercised to varying degrees with other firms in the industry [3] [4]. This paper concentrates on these latter aspects dealing with the conception of international projects from the earliest stage when information first comes into the firm or is looked for by the firm, which influences the later project stages. The process of obtaining overseas commissions and contracts, the perceived success rates in bidding and the particular factors influencing such success are further discussed. Any interaction between the different groups in the construction sector, the propensity to pass work on under certain circumstances are all examined. Before discussing the actual usage of information and whether or not this information is important to winning overseas business, it is important to note various characteristics concerning the overseas activities of the

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sample firms (which may not be typical of a wider industry sample):

SAMPLE CHARACTERISTICS

The findings which follow are based on empirical research conducted by interviews in 1987 with a sample of some 20 companies/firms including contractors, architects, consulting engineers, surveyors, turnkey- operators and capital goods manufacturers. The proportion of current workload overseas was 31 % on average for the entire sample. This varied from 12 % for consulting engineers to 19% for architects, 42 % for surveyors, 40% for contractors and 68% for capital goods manufacturers. Most of the overseas work was outside Europe; the continental EEC workload figure was only 2 % on average (for architects it was 5 %). Half of overseas work was with new clients. Contractors recorded the highest figure of 85% for the new client work, and architects the lowest (29 %).

Work obtained through other professional firms, contractors or management contractors amounted to 42 % on average . Again this figure varied according to type of grouping, as follows:

Architects	16 %)	
Contractors	38 %)	
Consulting Engineers	52 %)	Average 42 %
Surveyors	55 %)	
Capital goods manufacturers	59 %)	

THE PROCESS OF OBTAINING OVERSEAS WORK

It is clearly very important to understand the process by which commissions or contracts are obtained for overseas work. The sample companies were asked to describe the process by which three of their recent commissions or contracts were obtained and the details, spread over some 50 projects are summarised in Table 1. The importance of a network of relationships with other companies at home and abroad and with the international (ADB, UN etc.) and UK aid (ODA etc.) agencies is shown to be of

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major significance for all types of construction sector firms. These relationships, however, appear to be particularly important for architects, where a whole range of "other relationships" were apparently important in obtaining work overseas; and for consulting engineers, where it was links established with the aid agencies that were of paramount significance. These two groups of factors, together with direct visits from the UK to target countries and information received through local offices, local joint ventures, agents etc. within overseas markets were of considerable significance. It should be stressed that, especially for the contractors and capital goods manufacturers, receiving information from whatever source was only the first stage in a lengthy and competitive process involving prequalification and competitive tendering. What is important is that what might be viewed as a more common route of obtaining published market information through the Department of Trade Export Intelligence Service (EIS), newspaper calls for tender etc. was rather unimportant in obtaining export /overseas business.

SUCCESS RATES IN BIDDING FOR OVERSEAS PROJECTS:

As is very clear from the above, quite a lot of work obtained by the construction sector firms in the sample did not involve formal tendering as such. Where, however this does take place, it is important to know the success rate in bidding. In such bids, the average success rates was 1 in 10 overall. For architects, the figure quoted was 1 in 7; for surveyors, when they were bidding out of their own overseas offices or bidding with turnkey contractors, success was as high as 1 in 3, whereas on other occasions it was considered to be much lower, making an overall average of 1 in 14. For consulting engineers, contractors and capital goods manufacturers, figures of 1 in 10, 1 in 12 and 1 in 8 were cited. It should be emphasised that there were big differences between individual firms as well as between types of firms; some companies were extremely selective and were able to get their success rate in bidding to 1 in 3, or actually 7 out of 10 in one or two instances.

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REASONS FOR FAILURE IN BIDDING FOR OVERSEAS PROJECTS:

As to the reasons for lack of success, in the majority of cases firms gave price as a cause for failure in bidding. Many other reasons [see Table 2] were also given:

Track record was mentioned by more than half the firms; this took the form of not being broad enough, lack of expertise in the particular area of work, etc. It expressed itself too in a general lack of experience overseas or a lack of experience in the particular country concerned. The other common reasons cited included lack of good connections with the client; political pressure on a government-to-government level; poor financial packages; and lack of suitable technical proposals or of product style for the client.

To some extent the firm-client contact has to be taken as essential for the clinching of any bid and was probably not mentioned more often by the firms because it was taken as given. Some countries were more in evidence than others when it came to high level government contact. In some instances government influence was described as being interrelated with the financial package. This was also expressed in terms of difficulties of obtaining guaranteed finance and in not being able to obtain sufficient aid from British sources.

Technical aspects were more in evidence than firms actually mentioned. Sometimes clients renegotiated a commission or bid on the basis of the best technical proposal or they had a particular product they liked and were prepared to pay for. Some firms found the opposite applied, in that clients did not value the service offered them sufficiently, or the firms themselves estimated on the basis of meeting too high a standard. Further reasons given for unsuccessful bidding included lack of an ability to demonstrate actual project work in the home market, preference for local companies and indigenous firms, and the simple fact that the company was part of

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a consortium which itself failed to win the job.

It was noted that aspects relating to bid documents were hardly mentioned by the firms themselves, and the issue was discussed in interviews with sample companies only after prompting. Late receipt of market information or of bid documents was usually sufficiently critical to stop a bid being mounted; sometimes this was because quotations from other firms could not be obtained in time. Difficulties in preparing and submitting tender documents were not seen as a major problem. If there were difficulties here, the firm simply would not bid. On a few occasions companies found acceptable qualifications a stumbling block. For instance, bidding arrangements were sometimes far too stiff to countenance. Age limits were set for staff working overseas to over 35s in some cases, as in projects for the UN.

Incorrect completion of tender documents was not given by any company as a reason for failure. This last aspect has to be taken together with other studies conducted with clients or aid agencies, however, who do see this as problem, especially where a foreign language is involved. One consultant pointed out that many British capital goods' suppliers were particularly poor at complying with specification and filling out documentation in his company's experience. Foreign competitors were considered to be far more flexible and careful in this regard.

OVERSEAS WORK AND RELATIONS WITH OTHER CONSTRUCTION SERVICE FIRMS

The close inter-relationship between companies in the industry has already been indicated. The aim of the discussion here is to present more detail on this important issue. The proportion of overseas work claimed to be passed on to other firms was as follows:

Architects	11 %
Quantity Surveyors	5 %
Consulting Engineers	4 %

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Contractors	45 %
Capital Goods Manufacturers	65 %

In the vast majority of instances , the work being passed on was of a specialist nature, and examples of this are illustrated in Table 3. On only two occasions was overcapacity mentioned as a reason for passing work to other firms. One case arose as a result of an architectural competition: time was pressing and so another company was brought in to help. Ten companies in the sample considered that there was positive evidence of work being passed on from major contractors and major consultants to other smaller firms. Several of the larger architects and consulting engineers were, however, sceptical of this occurring at all in their own professions. Their feeling was that larger professional firms kept their own work and would not be likely to sub-consult. The small firm, by this view, had to find their own niche or ignore overseas work altogether.

About half the sample firms thought that the route most likely to win small firms overseas work would be in combination with larger international companies. But there was also a fair body of opposition to this view. One firm pointed out that some smaller consulting specialist companies had been taken over by larger accounting and management consulting groups. The larger firm recouped a proportion of the profit and the smaller firm gained access to the wider contacts of the larger group and, in addition, was able to count on the superior financial backing from the group. Another firm pointed out that the major equipment suppliers and capital goods manufacturers were being forced to compete in providing a total package in world markets. This led them to draw upon the services of consulting engineers and other groups.

SUMMARY AND IMPLICATIONS

The actual process of obtaining work overseas highlighted, the importance of networks of relationships, of contacts, visits etc. Relationships established with other firms, recommendations from these firms and other links established

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with, for instance, the aid agencies, were regarded as of major importance in obtaining successful commissions / contracts. Such relationships appeared to be particularly important for architects and consulting engineers. These relationships sometimes eliminated the need for formal competition, particularly for the consulting engineers, architects and surveyors. But where competitive tendering did take place, the average success rate was around 1 in 10, indicating a very costly process. The plea to government, commonly expressed, for financial assistance in feasibility studies, tender costs etc. is thus understandable.

Although price was the main reason cited for the lack of success in tendering, other issues such as track record (either at home or abroad), connections, political factors (indigenization in demands in developing countries, political pressure on a government-to-government basis) and poor financial packages were also mentioned.

As expected, the capital goods manufacturers and contractors subcontracted a large part of their overseas work - on average .55 per cent for the two groups. For the professional firms, by comparison, the proportion of work passed on to other companies was small or insignificant.

This led to the question as to how smaller firms might enter and succeed in overseas markets. The majority of companies were in favour of a consortia type of arrangement in principle ; but at the practical level the underlying competitiveness of the firms and suspicion between parties might be a major barrier to promoting any such arrangements. Complementarity would also be necessary among consortium members if success was to be achieved [5].

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TABLE 1: ROUTES to OBTAINING SUCCESSFUL COMMISSIONS / CONTRACTS

<u>SECTOR GROUP</u>	<u>No of Commissions / Contracts</u> (Total Projects = 51)
<u>ARCHITECTS [14]</u>	
Relationships with other firms (architect, bank, consulting engineers, management contractor etc.)	7
Direct approach through local office in country	3
Direct approach through the local joint venture	3
Repeat business	1
<u>SURVEYORS [6]</u>	
Relationships with other firms / recommendations	2
Repeat business	2
Direct visit from UK to country	1
Invitation following inward mission to UK	1
<u>CONSULTING ENGINEERS [16]</u>	
Links established with World Bank, UN, ADB, ODA	7
Relationship with / approach from other firms (UK equipment supplier, US contractor)	3
Direct approach (through local office, agent, joint venture partner)	3
Direct approach (through local office, agent, joint venture partner)	3
Follow-up to EIS, newspaper information	2
Repeat business	1
<u>CONTRACTORS [9]</u>	
Relationships with / approaches from other firms	2
Direct visit from UK to country	2
Follow-up to EIS, other subsidiary in country	1
Direct approach through subsidiary in country	1
Repeat business	1
Invitation from ODA to tender	1
<u>CAPITAL GOODS MANUFACTURERS [6]</u>	
Relationships with / approaches from other firms	2
Direct approach through sales engineers, local agent in country	2
Invitation from Crown Agents to tender	1
Repeat business	1

TABLE 2: REASONS for FAILURE in BIDDING ON OVERSEAS PROJECTS

Price not low enough
Track Record:
- Lack of breadth or experience of particular work
- Lack of experience overseas
- Lack of experience in actual country
- Lack of project work in home market
Lack of Good Connections with the Client
Competitor Political Pressure at a Government Level
Insufficient British Aid available
Poor Financial Packages
Not enough Guaranteed Finance
Lack of Suitable Technical Proposals
Lack of Product Style for Client
Client not Appreciating Service Offered
Estimate made on basis of Too high a Standard
Being part of Consortium which failed to win bid
Client Renegotiated with Competitor
Preference of Client for Indigenous/ Local Firms

TABLE 3: EXAMPLES OF SOME TYPES OF WORK PASSED ON

Groundwater engineering
Acoustic work
Natural spa water
Mechanical & Electrical services
Routine tasks(e.g. some draughting)
Architectural transport specialisms
Economist work
One-man consultancy work
Environment work
Project management

Piling
Blacktop
Earthworks
Ventilation Electrical Work
Fabrication, manufacturing
Electrical motors valves
Control systems

Architect design work)
Consulting engineering design work) Types of work passed on
Quantity surveying) to constr. sector groups
other than their own.

Assessment of strengths in the UK international construction sector

Nigel Mansfield

The background to international production theory is presented with a view to relating the eclectic approach to a part of the international construction industry. This sector includes a number of industry participants: consulting engineers, architects, surveyors, contractors and capital goods manufacturers etc. It can be observed that the sector has adapted to changing client requirements, partly triggered by competitive pressures. The nature of these can be predicted to some extent from the brief reviews of some theoretical and empirical work; the latter is drawn mostly from the contracting sector, but it is widened here to include other sector groups. Fieldwork has thus been carried out to interview a total of 20 firms comprising the different parties to the sector. Although consultants were of primary interest, it was considered that a wider selection of parties should be interviewed in order to determine some of the aspects common to each group. There is also a measure of interrelating across each group in carrying out international projects although this is more the case in competitor nations. Questions were framed on their own strengths and weaknesses, and that of their competitors, as well as the opportunities and threats faced. The findings of the survey and that of the earlier review are brought together in order to summarize where the main 'advantages' of the firms lie.

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Department of Civil Engineering, University of Strathclyde, 107 Rottenrow, Glasgow G4, Scotland

International activity is explained by Dunning¹ in the eclectic theory in terms of ownership (O), locational (L) and internalization (I) advantages. Home and host country characteristics are varied along with firm and industry specific factors. This approach suggests that international firms will be 'most active in those sectors in which their competitive or ownership advantages are most pronounced'. In exploiting these advantages, firms have to decide whether to 'internalize' their use or sell or contract them to other firms'; the service of management may be contracted out or used internally. The firm must also decide whether to 'export' or 'produce' in the host country or some other country. The latter issue is determined in response to certain locational factors².

In analysing the international construction industry, Seymour³ chose the eclectic theory because 'it provided a general theory rather than a specific theory' of the international firm. It also drew upon many strands of other earlier theories and was applicable to international construction despite the industry having special characteristics.

OWNERSHIP ADVANTAGES

Firm specific ownership advantages are bound up with the firm itself. Seymour³ pinpointed four major firm specific advantages in a construction (contracting) services sector context: the firm's name, human capital, breadth of services offered and size. The firm's name was intertwined with reputation, expertise and track record, including the quality of past work. The human capital element was a vital and basic characteristic as it is in any service type of firm. The services offered and the firm's size were also linked to the ability to carry out complex projects, which could often be large. The

international firm has to compete with other such firms and also with the local indigenous sector. In doing so the firm has to differentiate itself, its product and the service it offers in order to remain competitive¹. Mansfield⁴ found a similar dependence on human-capital management resources, in the British consulting sector, where the benefits and advantages of operating overseas were examined: reputation, expertise and track record were also seen to be important.

Country specific advantages were associated with the nationality of the firm and were affected by the interplay between the home and host country. Dunning's firm specific factors are mirrored in country factors to some extent. (For instance the size of the nation's market will be closely linked with the size of the firm.) The economic and business climate and government policies can also have a direct influence and there are indirect effects from cultural, economic, political and historic ties. There is a 'psychic' distance between countries which can be very close, even when they are far apart geographically. A threefold source of country specific competitive advantage was noted in construction; these arose from the relationship with other industries in the domestic market, the home country's own clients and other services related to construction³.

As regards the demand for related services, 'the more a country's contractors are demanded abroad, the more the host country will favour the whole group within the industry'. Also, the visible international presence of own nationality consultants was seen as providing benefit for contracting firms at least in the anticipated flow of information on upcoming projects. Such a link would help a contractor to win a bid, although the reputation of UK consultants for impartiality was thought to have an adverse effect on UK contractors' bidding chances, in some instances.

INTERNALIZATION FACTORS

Internalization is the second strand of the OLI theory. The internalization concept has been developed by Buckley and Casson⁵ in particular: imperfect competition leads the firm to internalize such major activities as training, marketing and new development activity. Invariably, a firm will pass in turn through the stages of exporting, licensing and foreign direct investment (FDI). Licensing is to be found infrequently in construction. In the exporting mode, personnel are moved around construction markets according to demand. According to Neo⁶ and Park⁷, in construction contracting, the construction base is transported to the final product until completion; this is the converse of manufacturing. Exporting and FDI can be interchangeable and they can also be used simultaneously in international contracting.

Enderwick⁸ considered that 'the volatility of contracting encourages multiple modes of market servicing'. He also found that 'little weight was given to the desire to integrate overseas operations within a global strategy'; contracting firms were more likely to operate as international companies rather than 'globally integrated multinational enterprises'.

Seymour discussed the extent that contracting firms would enter into backward integration related to

materials, consultancy, financial and feasibility studies etc. He concluded that resources which have alternate uses in other industries would not generally be internalized. If they are, inefficiency can arise since resources may be underutilized. For this reason, consulting engineers and architects are not likely to become part of the vertical integration strategy of international contractors. Internalized resources, which are hired out to other industries, increase the demands on management supervision. Contractors internalize only those personnel who do not have uses in other industries.

LOCATIONAL FACTORS

The many locational influences that encourage a firm to set up in a new country have been covered in various texts⁹. There are economic factors of production such as access to land, labour and capital in a foreign country, which are cheaper or more efficient than at home. Wider market opportunities provide a further incentive, and distance from the market soon determines that these need to be serviced on their own doorstep through FDI. There can be defensive reasons for setting up abroad, such as 'safeguarding the firm's current export driven market share in the host country'.

Davidson¹⁰ identified three broad trends: 'Investment activity is closely correlated with market size. Firms exhibit a significant preference for near similar markets. The presence of an existing subsidiary exerts a positive effect on the firm's foreign investment decisions'. He further concluded that corporate experience has two effects on location patterns. Firms prefer countries in which they are already actively working. As their experience increases they tend to enter more unattractive locations, partly because other firms do not also favour them. This gradually leads them to seek more and more 'global economic opportunities'.

The findings of the interviews with 20 firms and companies, are now introduced under the headings of strengths and weaknesses, opportunities and threats for both firms and competitors.

RESULTS FROM SURVEY OF CONSTRUCTION SERVICES FIRMS

Firms' strengths

Technical expertise, management and international experience

Firms were requested to assess their strengths and weaknesses (see Table 1). Strengths were seen to be related to their track record or technical expertise in certain project sectors or parts of sectors. Some saw this as being significant in terms of the size of projects they could tackle, the UK clients with whom they had connections or the technical superiority and innovation they had achieved. For instance, one capital goods manufacturer considered they were at the leading edge of technology in some of their products; a surveyor firm pointed out the distinct nature of the British quantity surveying profession and one of the consulting engineers had a recently developed patented crown copyright system which was unique to the UK.

Table 1. Firms' perceived strengths and weaknesses regarding overseas work

Strengths	%	Weaknesses	%
• Technical expertise	80	• Financial resources	70
• Client fulfilling requirements (e.g. technology transfer requirements)	30	• Track record and overseas experience	35
• Country factors (e.g. English as international language, British standards)	30	• Size	30
• International experience	25		
• Price competitiveness	20		
• Personnel and management resources	20		
• Other (e.g. local offices, multi-disciplinary approaches, expertise in turnkey projects)	20		

Track record was also valued in terms of international experience gained either in terms of a single geographic region or worldwide. One firm stressed it had many years of company experience overseas and two others referred to the lengthy experience of their management staff abroad. Teams of managers able to display good interdisciplinary working relationships were also seen as important. Some of the enterprises were happy to record that they could compete on price against other developed countries, such as the Americans and the French, provided both of these were not too heavily subsidized by their governments. Lower wage costs and higher productivity were helping the competitiveness of capital goods manufacturers.

Country factors

A commonly expressed view was that there was a certain amount to be gained from being British: English was an international language and British standards had been adopted by many countries in which they worked. British consultants had a longstanding reputation for reliability, which had a carry-over effect to other nonconsulting groups operating in the construction sector. This apart, some firms had sought to develop particular skills in dealing with clients in French-speaking regions.

The Scottish factor was mentioned by three firms who were based in Scotland. One firm indicated that some overseas clients liked a 'low-key nonbrazen approach'; a second referred to the 'totally illogical welcome' that some clients afforded them on first introductions and a third considered that 'traditional engineering skills were still valued' in certain quarters.

Client fulfilling requirements

Other facets of the firms' strengths lay in the way that services were offered to the client. A few firms emphasized that they provided staff of the right calibre for training in technology transfer. It was seen as an important role that all groups had to play here in assisting developing countries to progress. Those that

were involved saw an increasing need for their services with specific backing coming from the international aid agencies.

Some firms had expended much effort in establishing themselves in the host country; good contact was being made with the client through well established local offices, equipped with autonomous directors or partners and fully qualified senior staff on the spot could provide an instant local service. This was effective in achieving a high proportion of repeat orders and referral work.

Various other factors were mentioned that were seen to be putting firms into a stronger competitive position. A multidisciplinary approach supported from an organization of sufficient size was seen as being very useful. One highlighted their skill again in being able to negotiate turnkey contracts with clients and in being able to mobilize high-level contacts in British government departments to guarantee financial assistance at a crucial stage in the bidding process. Turnkey projects produced healthy margins for those contractors who were large enough to handle such projects; one of these contractors had grown substantially in the last decade using this approach.

Firms' weaknesses

Financial resources, size and experience

Under the heading of weaknesses (see Table 1), by far the most commonly mentioned by all groups was their lack of financial resources. This expressed itself for consultants in an inability to fund very much marketing and front-end speculative work or to participate widely in the bidding process. One of the larger capital goods manufacturers was experiencing a drain on their margins from severe bonding requirements. Another felt that their corporate structure and private ownership did not enable them to face much financial exposure. One way to survive was 'not to take on an overseas contract that was more than 10% of the company's turnover unless it was a British aided project'.

Many of these ills were to do with the size of the firms. Two smaller consultants were looking to 'hitch a ride' with larger contracting groups. Even those firms which were in a medium-to-large size category believed that their size went against them. For instance, one of the capital goods manufacturers pointed out that problems could arise with firms being 'too large for smaller projects and too small for bigger projects'; clearly it was difficult to get the balance right.

Lack of actual international experience was a pressing issue for those firms, who were trying to break into the overseas market or who were trying to increase their overseas turnover. Their lack of finance for up-front activity was possibly a more crucial factor however.

Opportunities

Technical sectors and funded projects

Future opportunities (see Table 2) were arising on a number of fronts. Overseas sectors of promise were seen in a variety of construction sectors (see Table 3). These included new projects as well as rehabilitation, maintenance and operation of projects completed a decade ago or more. Another felt there would always

Table 2. Firms' perceptions of opportunities and threats regarding overseas work

Opportunities	%	Threats	%
• Specific sectors of technical work	30	• Reduced construction demand	35
• Aid-funded projects	20	• Increased competition	30
• Industry reorganization, requiring flexibility, multidisciplinary teams, etc.	20	• Competitors' financial backing	30
• Middle East situation e.g. war, oil price etc.	10	• Emergence of developing country firms	25
• Other	25	• International risk	20
		• Other	25

Table 3. Overseas technical sectors of opportunity

Health	Agricultural engineering
Education	Urban planning
Hotels	Power/agriculture
Leisure	Aquaculture
Highway	Water distribution and sewerage
Traffic management	Automation and industrial processes
Control systems for developing new technology	

be a market overseas for any firm that had 'made a name for itself and who could offer a special expertise'. This remark was tempered to some extent by a further firm who saw any such service as 'gap filling in indigenous capability'. Nonetheless, several new opportunities were seen to be arising in training arrangements with host country firms or government departments. Some of the major agencies were described as having considerably expanded their budgets in the technology transfer area in recent years, particularly in project-related know-how exchange.

Further future funding was reckoned to be forthcoming from the World Bank and African Development Bank agencies and, also in Africa, through British banking institutions. There were hopes too for increased bilateral funding from Britain.

Industry reorganization etc.

As regards future opportunities within the construction industry context, one firm considered that surveyors would benefit in the American market if they could tailor their service to meet the needs of 'construction project and cost management'. Others saw a more multidisciplinary approach as a future fruitful avenue. Much would be done through total project management and the bringing together of packages. New trends in the privatization of large projects through build-own-operate-transfer (boot) were instanced, eg. water and electricity supply facilities. Overseas clients were wanting in all-in projects involving arrangement of funding, design, construction, maintenance and operation.

There were also a number of other possibilities; some firms said they saw gaps in traditional British markets

when current UK firms became overstretched or temporarily disgraced. Another firm felt that parts of Africa would still keep coming back to British firms, on account of long standing relationships.

Threats

Demand changes

In commenting on threats (see Table 2) to their overseas activity, firms pinpointed a number of difficult areas. The foremost of these was that construction demand had reduced worldwide. Some firms had experienced a virtual drying up of work in those countries linked to an oil economy. Some developing countries were not exporting as much as they had before due to a fall-off in trade generally and this was reflected in their infrastructure requirements. The more developed countries also had less money to spend on construction. Others saw a major overcapacity problem in manufacturing capability worldwide and a levelling off in demand for 'jumbo project' infrastructure.

Competition

Increased competition was a further natural consequence of reduced demand. One firm said that their home base was over-resourced with senior staff who had returned from overseas; dealing with them was made more difficult due to their own firm's policy of fostering in-house company people in order to cope with the demands of overseas work in the first place.

Serious competition was seen to come from the new industrialized countries (NICs); some of their massive contracting groups were undercutting on price, which they partly achieved through much lower overheads; staff and workforce alike were prepared to make do with poorer accommodation and simpler transport. Many developing countries were also increasing their own competence. Some governments were insisting on their nationals participating in doing the work while being trained at the same time, particularly in certain Arab territories.

Competition was coming from other British firms and from European firms for most of the time and from NICs in more than half the sample. Many other countries were mentioned (see Table 4).

There were also various other factors to be contended with; certain countries were undertaking work for the purposes of obtaining foreign exchange and this greatly

Table 4. Countries as main competitors (expressed as percentage)

	%		%
America	15	Korea	40
Australia	5	India	30
		Brazil	10
France	35	Rumania	5
Germany	20	Bulgaria	5
Italy	15	China	5
Scandinavia	5	Saudi Arabia	5
Greece	5	Gulf States	5
Japan	5	Malaysia	5

influenced their bidding price. Established surveying firms were experiencing competition abroad from UK staff agencies, and from clients that called for an international bidding system along American lines or for certain kinds of turnkey projects.

Payment risks and financial backing

The more risky aspects of international work were also emphasized; problems had arisen through not being paid or through long delays in payment when compared to equivalent projects in the UK. One consultant was withdrawing from bidding for overseas projects on their own since domestic projects within the UK had proved more profitable recently. Their adverse experience of overseas work in the past coloured their present attitudes and they chose instead to bid with capital goods manufacturers or contractors on a package basis.

The financial backing from competitor firm's governments, in the form of subsidized bids, bilateral aid and extended terms of payment compounded the risk here, particularly when such subsidized assistance could be assumed to be supporting competitors in any future promising projects. The strength of sterling was mentioned here as having reduced competitiveness. An appeal was made from some Scottish firms for more meaningful financial backing from the Scottish banking sector. The London merchant banks had to be relied upon here but firms doubted whether the best banking support was being made available.

Competitors' strengths and weaknesses

The strengths of competitors (see Table 5) was mirrored as would be expected in some of the weaknesses of the sample firms and the threats facing them.

Cheapness of price was mentioned frequently. Koreans were particularly sharp in their bids and this was brought about by their more modest overheads as evidenced in their cheaper engineering design and site facilities. India and Brazil had lower salaries. India was competing in the Middle East and Brazil in North Africa. Government financial support was again frequently mentioned; in particular the French and Japanese with their government-backed companies and access to favourable loan conditions. Heavily subsidized feasibility studies was also giving competitors an advantage. German companies seemed to benefit at the later construction stage by having been involved in the feasibility or design through their own consulting arms.

Financial packages and bilateral aid were also seen as important with the Japanese and French, deriving the most advantage here. Americans were attributed with providing good sources of finance. Korea had plentiful supplies of labour and some countries' contractors sourced their staff with European supervisors and operatives from the Indian subcontinent and Egypt. Joint ventures with local host-country companies were being arranged most notably by the Japanese for large projects.

Developing countries were also insisting that their own firms did the work where they could. Some developing country and NIC firms seemed to be much more flexible in the way they offered proposals to the client. Some of the NICs demonstrated 'sheer enthusiasm and persistence' here. Americans were described as far

Table 5. Perceived strengths and weaknesses of competitors regarding overseas work

Strengths	%	Weaknesses	%
• Competitive prices	55	• Quality	20
• Government financial support	40	• Costs	5
• Labour supply	15	• Currency strength	5
• Indigenization requirements (for developing country firms)	10	• Debt	5
• Government political representation	10		
• Other e.g. marketing, quality	20		

better organized in marketing. High product quality was ascribed to the Germans and political associations to the Italians (e.g. Italy/Libya). The French were also more prepared to bring in senior ministers to support a bid than their British counterparts, who 'might muster junior minister'.

Competitors' weaknesses (see Table 5) were predominantly put down to quality, India being particularly mentioned here. Some European firms could not compete on costs. The strength of the yen had reduced Japan's competitiveness recently. The Koreans were also thought to be overexposing themselves as regards future debt.

CONCLUSION

This paper has sought to examine a cross section of the main groups within the British construction industry sector. The review conducted in the early part of the paper served as a framework for understanding the influences that different groups of firms face in extending their business overseas in a fiercer competitive environment.

Firms demonstrated that they had expertise to offer and were able to differentiate themselves from competitors in some instances. Reputation, size, human capital and breadth of services were shown to be vital firm specific advantages; the quality of management and international experience were also key elements. Some newly industrialized countries (NICs) could demonstrate greater flexibility and understanding of client needs however.

Country specific advantages of competitors were seen in the financial and political backing, sometimes forthcoming from the intervention of top ministers and from the effective subsidy of feasibility studies. Financial institutions played a part in determining whether projects could go ahead in certain regions, e.g. via the major aid agencies and the private UK banking sector. There were clear home country advantages and evidence of firms responding to former home clients' requests to take up projects in new regions.

The extent that firms gained advantages from internalizing their attributes and dealing across national borders was not fully investigated in this paper. Unlike contractors consulting engineers, surveyors and architects do not have to carry out their service on the site of

the project location. They are more free to carry out some of the work in another country and gain certain advantages from doing so. For all groups it was necessary to maintain control of local offices because this gave access to vital contacts and information on upcoming projects. Joint ventures with host-country partners were entered into, either out of choice or as a result of the clients' mandatory requirements; sometimes advantage could be taken of cheaper local production facilities. More often than not, a training element was called for which did have its costs. However, the quality of this part of a package could, in the future, have a marked effect on the firm's bidding success, if it is seen to enhance the package on offer. The possession of networks of offices across countries conferred advantages in being able to raise capital in the UK, in being able to transfer the name and reputation of the firm around the world and in being able to gain advance information for marketing purposes. There would appear also to be benefits in transferring various production techniques between offices, which assist the firm to maintain a competitive edge in the foreign location.

On the locational aspects, firms did indicate that they tended to operate in countries where they had projects. From that base, they could tender for work in neighbouring countries and gradually extend their influence. There were many indications of firms having perceptions of countries, which were favourable to their own nationality on cultural grounds. Psychic distance was seen to apply in the context of firms' connections with African clients, for instance.

Demand was a major consideration determining the activities of firms in the sample. Where firms had put down roots in countries, they sometimes reaped the rewards of being able to negotiate contracts directly. Counteracting competitor political associations, or direct government interventions, proved difficult for many firms. This threw them back onto other arrangements, involving various client fulfilling requirements. Turnkey contracts and 'boot' offerings were being used successfully in some instances. Those firms who were large in size and had extensive networks stood to benefit more than smaller medium-sized firms. However, technology transfer packages may well be taken on board to advantage by all sizes of firm; these will continue to appear in future projects because most developing country clients increasingly favour such arrangements.

British firms can be encouraged that they see strengths and future opportunities in specialist fields, whether it be technical projects or types of packages. This is necessary to maintain competitive advantage because NICs and developing countries will continue to reduce market opportunities in the price-competitive standard project realm. Even on the admission of the sample firms themselves they are likely to be constrained in their endeavours by financial resources and size, which are linked, and also by their own attitude to strategic planning in some cases. This may give rise to various forms of organizational positioning within the industry in the future^{11,12}. Further aspects remain to be investigated and research into the sector is continuing¹³.

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On graduating from Birmingham University, Nigel Mansfield joined RPT (Consultants) where he worked on various projects in the UK and Iraq. He later joined Cubitts (Contractors) and then Devon CC before moving to Central America where he was in charge of bridges and marine works for the MOW Belize through the ODA. Responsibilities included technical, financial and administrative aspects of projects from conception to completion. On returning to the UK he took an MBA at Strathclyde Business School, prior to taking up his present appointment lecturing in construction and project management at the University of Strathclyde.

