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DEPARTMENT OF MARKETING

**Firm-Specific Determinants of Success for Small High Technology
International Start-ups: A Performance Study of UK and US Firms**

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DEDICATION

To my son Alexander, with great love and pride

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ABSTRACT

Today's business environment has been fundamentally transformed as a result of the world's recent evolution into the information age, along with the advent of the global economy. Knowledge-intensive firms have proliferated in this new economy and have been observed to employ more proactive and rapid internationalisation strategies than traditional firms. While traditional start-ups generally originate as domestic firms and gradually evolve into multinational enterprises, contemporary start-ups increasingly begin as international firms. This study set out to examine several key dimensions of these emerging high technology international start-ups, conducting a quantitative and qualitative study in the UK and US in order to enhance academic knowledge by addressing crucial gaps in the limited extant literature.

The study's primary research objective was to identify firm-specific success factors for small high technology international start-ups, so as to understand what specific founder, organisation, and product and marketing strategy characteristics are correlated with higher relative levels of performance. The study found that the critical success factors were the international commitment of the founders, having an entrepreneurial and goal driven internal organisational behaviour, applying customer-driven product design, having unique and innovative products, engaging in continuous innovation, and targeting similar customer segments world-wide.

Another major research objective was to identify factors influencing their distinctive early internationalisation in order to understand why small high technology start-ups are increasingly international in nature at or near inception. The study found that the most influential factors were the international vision of the founder(s), the desire to be an international market leader, the identification of a specific international opportunity and the international and competitive nature of the firm's industry.

The findings of this thesis study have important implications for theory, practitioners and policy-makers. These implications are delineated in the thesis along with limitations of the study and suggested areas for future research.

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND TO THE RESEARCH

Today's business environment has been fundamentally transformed as a result of the world's recent evolution into the information age, along with the advent of the global economy. Aggarwal (1999) argues that the modern information age has led to competition based on the mastery of ideas and technology, which is not restricted by geography and which is governed by new network economics. Aggarwal (1999) posits that technology and globalisation have become mutually reinforcing, with technology facilitating globalisation and with globalisation enhancing the profitability of technology. Knowledge-intensive firms have proliferated in this new economy and have been observed to employ more proactive and rapid internationalisation strategies than traditional firms (Bell, Crick and Young, 2000). This thesis examines these contemporary rapid internationalising knowledge-intensive firms, specifically focusing on small high technology international start-ups.

The OECD (1997) as well as numerous researchers (for example Litvak, 1990; McDougall, Shane, and Oviatt, 1994; Knight and Cavusgil, 1996; Madsen and Servais, 1997; Oviatt and McDougall, 1997; Knight, Madsen, Servais and Rasmussen, 2000) have recently noted the increasing commonality of new ventures that are distinctly international in nature at or near inception. In line with Aggarwal's (1999) contentions, these international start-ups frequently conduct business in high technology niche markets world-wide, utilising alternative governance structures and networks to overcome resource deficiencies (Oviatt and McDougall, 1994; McDougall, Shane and Oviatt, 1994).

While traditional start-ups generally originate as domestic firms and gradually evolve into multinational enterprises, contemporary start-ups increasingly begin as international firms. The primary differentiating characteristic is the age of the firm when it becomes international. International start-ups commence with an international business strategy, manifested by the early sourcing and employment of their resources as well as the sale of their products and services in multiple strategic markets world-wide, with the intent of gaining competitive advantage (Oviatt and McDougall, 1994). Their recent emergence has been linked to the genesis of the global economy and its ensuing impact on entrepreneurial orientation, such as the higher prevalence of an international vision amongst founders that stems in part from their prior international experience, and on industry competitive environment, with many industries now intrinsically international and with a large proportion of prospective customers being located world-wide (Johnson, 2001).

Internationalisation theory literature provides a limited understanding of international start-ups. Traditional models depict the small firm internationalisation process as being incremental in nature, whereby the firm commences with a domestic business orientation and gradually internationalises either as experiential and market knowledge accumulates (Johanson and Wiedersheim-Paul, 1975; Johanson and Vahlne, 1977) or through a series of distinct stages (Bilkey and Tesar, 1977; Cavusgil, 1980; Reid, 1981; Czinkota, 1982). However, numerous empirical studies focusing on the operational dimension of these internationalisation process models have found only limited support for their underlying incremental internationalisation principle (for example Turnbull, 1987; Sullivan and Bauerschmidt, 1990; Bell, 1995; Petersen and Pedersen, 1997). This literature, along with the international start-up literature, suggests the need to revise the models in light of contemporary business environment dynamics.

Other theoretical constructs likewise provide only a limited understanding of international start-ups. As will be shown in this thesis, economic approaches to internationalisation provide little insight and relevance for these firms, while other approaches such as the network and resource-based perspectives offer higher

explanatory value. Coviello and McAuley (1999) argue that small and medium-sized enterprise (SME) internationalisation is best understood through the integration of theoretical frameworks, positing that the stage models, economic approaches and network perspectives offer complementary views of smaller firm internationalisation. In agreement with this viewpoint, this study takes an eclectic approach towards existing theoretical frameworks so as to understand the complex and prevailing internationalisation behaviour of international start-ups.

1.2 RESEARCH CONTEXT AND OBJECTIVES

While previous research studies have provided evidence of the existence and emergence of international start-ups, the literature is considerably limited in nature. Extant literature is largely based on small-scale qualitative research. While qualitative methods are appropriate for exploratory research, the researchers involved in these studies have acknowledged the need for larger-scale studies, including quantitative work, to test earlier findings and facilitate an understanding of key dimensions of this emerging class of new ventures. Accordingly, this research project sets out to enhance academic knowledge of international start-ups by conducting a two-country study utilising both qualitative and quantitative methods, addressing crucial gaps in the literature. These gaps, in turn, provide the basis for the study's research objectives.

The primary research objective of this study is to *identify firm-specific success factors for small high technology international start-ups*, so as to understand what specific founder, organisation and product and marketing strategy characteristics are correlated with higher relative levels of performance. The second objective is to *identify factors influencing their distinctive early internationalisation* in order to understand why small high technology start-ups are increasingly international in nature at or near inception. The third objective is to *identify factors influencing the selection of their initial country markets*, while the fourth objective is to *identify factors influencing their common early establishment of foreign-based*

organisational activities (e.g. sales or service offices), in order to gain an understanding of these key activities.

The study focused on small independent high technology international start-ups (to be specifically defined in Chapter 2) in the UK and US since prior academic studies have found that international start-ups are commonly small in size, entrepreneurial in nature, frequently operate in high technology industry sectors and are present in sufficient quantity in the UK and US to conduct the study. Furthermore, the UK and US represent two of the world's leading international business centres, spanning two continents, which facilitates national comparison of international start-ups. The study's four research questions, which emanate from these objectives, are delineated below.

Research Question 1

- a) *Which founder, organisation and product and marketing strategy characteristics of small high technology international start-ups are significantly correlated with performance?*
- b) *Which of these characteristics are the best predictors of performance for small high technology international start-ups?*
- c) *What differences exist, if any, between these findings for UK and US international start-ups?*

Research Question 2

- a) *What are the key factors influencing small high technology start-ups to be international at or near inception?*
- b) *What differences exist, if any, between these factors for UK and US start-ups?*

Research Question 3

- a) *What are the principal factors influencing the selection of initial country markets for UK and US small high technology international start-ups?*

b) What differences exist, if any, between these factors for UK and US international start-ups?

Research Question 4

What are the primary factors influencing small high technology international start-ups to establish organisational activities (e.g. sales or service offices) in foreign countries in the early years of their existence?

The answers to these research questions will shed light on vital dimensions of international start-ups and represent timely and important research due to the emerging prominence of these firms. The value extends not only to the enrichment of academic knowledge, but also to the profound and direct implications for practitioners and policy-makers. Practitioners, and more specifically current and prospective international entrepreneurs, will uniquely benefit from the identification of factors that were found to enhance the performance and success of high technology international start-ups. Policy-makers will gain an understanding of appropriate policies and support programmes that are required to foster the economic development of these small knowledge-intensive early-internationalising firms. The methods utilised to address these research questions are succinctly described in the following section.

1.3 RESEARCH APPROACH

Based on the limited state of extant literature and knowledge of international start-ups, due in part to their recent emergence on the world stage, this research is best described as being exploratory in nature. In order to answer the research questions outlined in the previous section, a combination of approaches encompassing both qualitative and quantitative techniques was determined to be the most appropriate methodology for this exploratory study. This mix of research methods, facilitating both exploration and generalisation, is supported by a host of scholars (for example Churchill, 1987; Baker, 1991; Chisnall, 1997; Aaker et al., 1998).

The first phase of the research involved qualitative methods, designed to probe and explore issues related to the study's research questions, which served to augment existing literature in the development of a questionnaire for the ensuing quantitative phase. Accordingly, a series of in-depth personal interviews were conducted with founders and top executives of small high technology international start-ups in the UK and US. Six such interviews were conducted in the UK and six in the US.

The second phase of the research embodied a quantitative design. A mail survey was selected as the most appropriate data collection instrument since it represented an efficient and low cost method of collecting data from large geographically dispersed samples. Furthermore, it facilitated both the testing of the study's research propositions, which emanated from the literature and qualitative findings, as well as the generalisation of the overall findings. Subsequently, 600 questionnaires were sent to early-internationalising high technology firms in the UK and 600 to comparable firms in the US, resulting in 102 usable UK responses (19.25% adjusted response rate) and 89 usable US responses (18.09% adjusted response rate).

1.4 STRUCTURE OF THE THESIS

The thesis is comprised of ten chapters, along with supporting reference and appendix sections. These chapters can be clustered into five distinct sequential modules: the introduction, literature review, research methodology, findings and conclusion. The structural configuration of the thesis is illustrated in Figure 1.1. This section will supplement the illustration by briefly describing the contents of each chapter grouping.

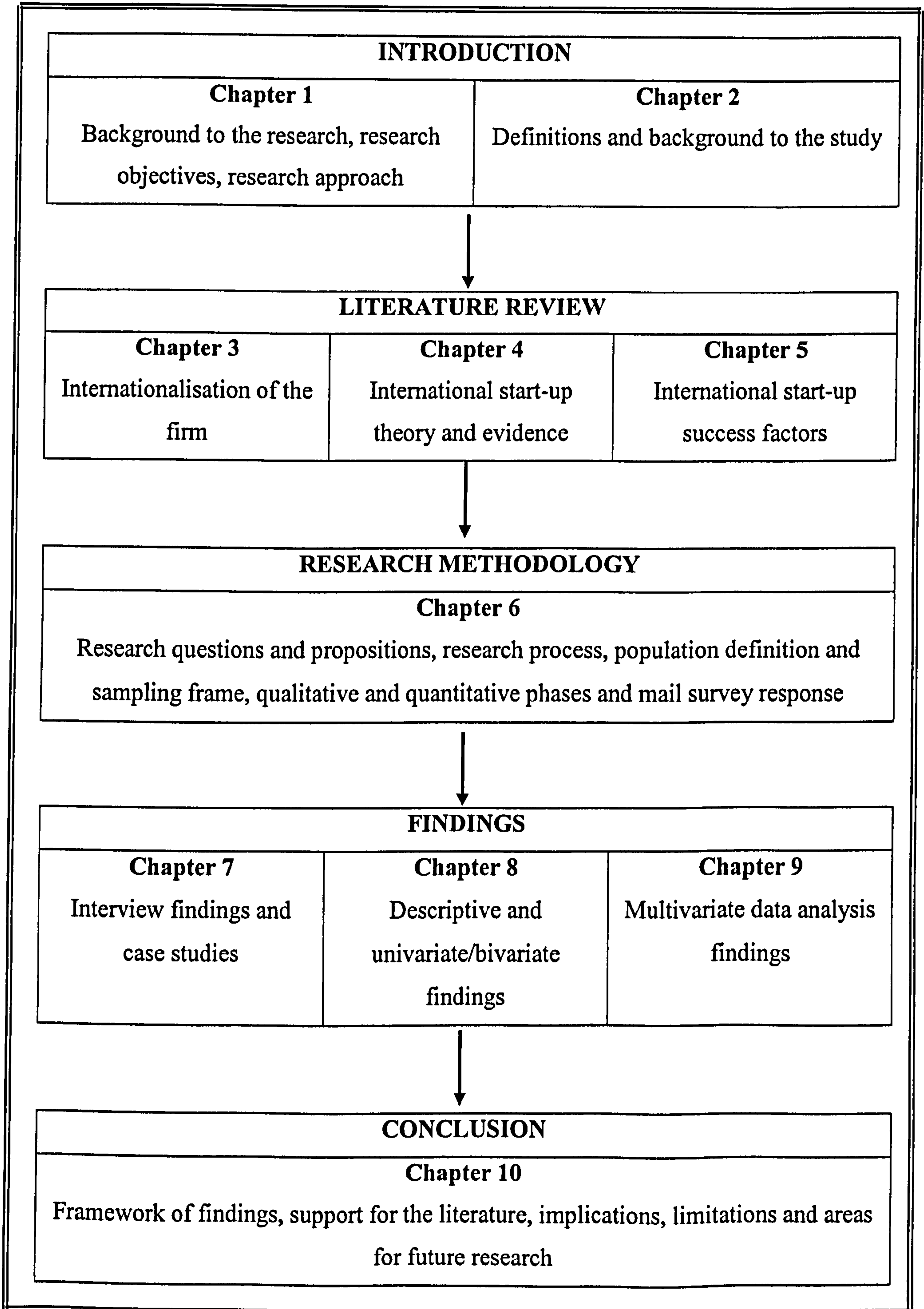


Figure 1.1: Structure of the Thesis

The introduction component of the thesis consists of two chapters. Chapter 1 describes the background to the research study, identifies critical gaps in the literature leading to the study's research objectives and questions, discusses the value and importance of the research, identifies the methodological approach of the research and delineates the structure of the thesis. Chapter 2 provides definitions of key terms utilised in the thesis, a holistic definition of small high technology international start-ups as applied in this thesis and an outline of relevant market characteristics of the UK and US, such as economic indicators, attitudes towards entrepreneurship, availability of venture capital and industry sector specifics.

The literature review is comprised of three chapters. Chapter 3 provides the theoretical underpinning to the study, reviewing economic/rational and behavioural approaches and theories to the internationalisation of the firm. Chapter 4 examines the relationships and explanatory ability of these theories to international start-ups as well as describes evidence of their existence and emergence, factors influencing their distinctive early internationalisation and their idiosyncratic characteristics. Chapter 5 outlines previous research findings pertaining to international start-up success factors, culminating in the development of an organising framework.

The research methodology component consists of a single comprehensive chapter. Chapter 6 commences with a restatement of the research objectives and questions, leading to the delineation of the study's research propositions. Research design issues and alternative approaches are then discussed prior to describing the adopted research design and process. The population definition and sampling frame are subsequently identified, followed by detailed descriptions of the qualitative and quantitative phases of the research. Finally, the questionnaire design is outlined, along with specifics pertaining to the mail survey's pre-testing, posting procedures, response rates and tests for non-response bias.

The research findings module is comprised of three chapters. Chapter 7 presents the study's qualitative findings pertaining to each of the four research questions as well

as provides six case studies of small high technology international start-ups. Chapter 8 provides both a description and profile of responding firms and the study's quantitative findings for Research Questions/Propositions 2, 3 and 4, utilising univariate and bivariate data analysis. Chapter 9 delineates the quantitative findings for Research Question/Proposition 1, which embodies the study's primary research objective, detailing the results of factor and multiple regression analyses.

The conclusion is encompassed in Chapter 10. The chapter discusses the study's principal contributions and provides a framework illustrating its key findings. The support of the findings for pre-existing literature, including theory, is then examined. This is followed by a discussion of the implications of the findings for theory, practitioners and policy-makers. Finally, the limitations of the study are described, along with the identification of suggested areas for future research.

INTRODUCTION

Before describing this research study it is essential to define key terms that will be utilised throughout the thesis as well as to provide backgrounds to the study's countries and sectors. The chapter commences with the provision of definitions of fundamental study terms in order to establish their precise meaning as applied in this research. This is followed by a description of foreign market entry mode options in order to both lay the foundation and facilitate the understanding of subsequent discussions of entry mode selection by international start-ups. The final section identifies and discusses demographic, economic and trade data, cultural differences, attitudes towards entrepreneurship, the availability of venture capital and data pertaining to the study's sectors for the UK and US.

2.1 DEFINITIONS

This section provides definitions and descriptions of key terms utilised in this thesis. The terms to be defined centre around the type of firms studied in this research project, small high technology international start-ups. Accordingly, definitions will be provided for a 'small firm', 'high technology firm', 'international firm' and an 'international start-up'. Furthermore, the term 'international entrepreneurship' will be defined and discussed, since international start-ups can be viewed as international entrepreneurial firms. Little academic agreement exists over the exact meaning and nature of these terms. Therefore, the intent of this section is to establish definitions for these key terms as they are applied in this research study.

2.1.1 DEFINITION OF A 'SMALL FIRM'

This thesis involves a study of small firms, specifically small high technology international start-ups. No universally accepted definition for a 'small' firm exists. Definitions vary not only amongst academics and governmental organisations around the world, but also by definitional approach (i.e. quantitative versus qualitative). While many definitions are based on quantitative criteria such as the number of employees or sales volume, others are based on qualitative criteria such as the independence or management style of the firm, while still others are based on a combination of these criteria. Furthermore, these differences are pervasive throughout the UK and US, where scores of different definitions for a 'small' firm exist (Beesley and Wilson, 1981; Reid, 1982). This section examines several leading definitions and establishes and provides justification for the selected definition to be utilised in this thesis study.

A frequently employed criterion for categorising the size of a firm is by the number of employees. While the previous paragraph highlighted widespread definitional differences, there is general convergence in terms of the number of employee criterion. The US Small Business Administration (1988), Bank of England (1997), European Network for SME Research (ENSR, 1993) and OECD (1997) all define a small firm as having fewer than 100 employees. However, minor differences exist between these organisations with respect to the number of employees constituting their sub-categories of a 'micro' and 'very small' firm. Table 2.1 summarises the criteria used by these organisations to measure the size of a firm by the number of employees. The employee numbers illustrated pertain largely to manufacturing rather than service firms. It is commonly accepted that the number of employees constituting a 'small' service firm is far less than for a 'small' manufacturing firm (OECD, 1997).

Organisation	Micro	Very Small	Small	Medium	Large
US Small Business Administration	---	<20	20-99	100-499	≥500
Bank of England	1-9	---	10-99	100-499	≥500
ENSR	1-9	---	10-99	100-499	≥500
OECD	1-4	5-19	20-99	100-500	>500

Table 2.1: Organisational Measurement of Firms by Number of Employees

(Source: The author, derived from the literature)

Another quantitative approach to the measurement of firm size is classification by annual turnover. However, the utilisation of this approach is problematic for several reasons. First, definitions vary widely with respect to turnover bands. Second, sectoral differences greatly complicate appropriate definitional categorisation, since typical small firm turnover can vary greatly by industry. And third, international comparison is hampered by the availability and accuracy of data as well as by foreign currency fluctuations.

Qualitative approaches to the definition of a small firm often centre around management, ownership and market characteristics. For example, the Bolton Committee's (1971) definition of a small UK firm included the qualitative criteria of independence, owner management and having a relatively small market share. However, the Bolton Committee definition, as well as other qualitative definitions, has been criticised for its lack of clarity regarding market share and the difficulty in obtaining required firm data pertaining to ownership and management (Stanworth and Curran, 1976; Storey and Johnson, 1986).

This study employs a quantitative approach to the definition of a small firm by incorporating a measure of the number of employees. Specifically, a 'small firm' is defined for purposes of this study as having fewer than 100 employees at the time of its initial international activity. The criterion of having fewer than 100

employees (full-time equivalent) is based on the general agreement of this size between the US Small Business Administration, Bank of England, European Network for SME Research and the OECD. The timing of the criterion tied to the firm's initial international activity is based on the early internationalisation focus and the retrospective nature of the study.

2.1.2 DEFINITION OF A 'HIGH TECHNOLOGY FIRM'

This thesis study focuses on high technology firms. No universally accepted definition for a 'high technology firm' exists. However, it is often defined as a firm that conducts business within technologically innovative industry sectors, which have an above-average R&D intensity and an above-average proportion of technical personnel (Butchart, 1987; Jones-Evans and Westhead, 1996). The technology is typically product or process oriented and the R&D can be in-house, out-sourced or part of a co-operative arrangement. Common sectors that are widely considered to be high technology in nature include, among others, advanced electronics, telecommunications, information technology and biotechnology (Butchart, 1987; Oakey et al., 1990; Jones-Evans et al., 1996).

The degree to which a firm commits its resources to R&D activity is referred to as its research-intensiveness. Research intensity in high technology firms is frequently measured by the percentage of firm turnover spent on R&D endeavours or the percentage of firm employees (full-time equivalent) engaged in R&D activity (Butchart, 1987; Felsenstein and Bar-El, 1989). This study measured both resource expenditure factors. However, since the study involved very young firms, which generally lack both significant early turnover and requisite resources for extensive R&D efforts, accurate measurement of research intensity is problematic. Moreover, while the establishment of specific percentage criteria for a firm to be classed as research intensive is quite arbitrarily applied in the literature (Butchart, 1987), these young firm characteristics further cloud the setting of appropriate percentage criteria in this study. Therefore, the study will not set a cut-off percentage, but rather will

consider a firm to have met the R&D criterion for classification as a high technology firm if it engages in any level of R&D activity as measured by these two indicators.

The study involved firms in three high technology sectors: computer software, computer hardware and electronics. The rationale for the selection of these three sectors is discussed in the Research Methodology chapter (see Chapter 6). Furthermore, each of the firms included in the analysis exhibited evidence of regular R&D activity, to whatever degree. **Thus, for purposes of this study, a ‘high technology firm’ refers to a computer software, computer hardware or electronics company that engages in ongoing R&D activity.**

2.1.3 DEFINITION OF AN ‘INTERNATIONAL FIRM’

In order to define an ‘international firm’ it is first necessary to examine the meaning of the term ‘internationalisation’. Johanson and Vahlne (1977) define internationalisation as “a process in which the firms gradually increase their international involvement”. Similarly, Welch and Luostarinen (1988) define internationalisation as “the process of increasing involvement in international operations”. Welch and Luostarinen further posit that internationalisation can be both inward (e.g. foreign outsourcing) as well as outward (e.g. exporting). In a like manner, Beamish (1990) defines internationalisation as “the process by which firms both increase their awareness of the direct and indirect influence of international transactions on their future, and establish and conduct transactions with other countries”. Common methods employed by firms to enter international markets are described in Section 2.2.

Juxtaposing these three definitions, internationalisation can be viewed as a firm’s gradual process of increasing international involvement. However, as will be detailed in Chapter 3, recent studies have suggested that this process can be early and rapid as opposed to gradual and incremental (see for example Turnbull, 1987; Sullivan and Bauerschmidt, 1990; Bell, 1995; Petersen and Pedersen, 1997;

Lindqvist, 1997). Chapter 3 examines numerous theoretical approaches to the internationalisation of the firm, providing a more detailed explanation of the process.

In light of this definition of internationalisation, an international firm can essentially be described as a company that has begun or that is further along in the process of increasing involvement in international business activity. **However, for purposes of this study, an ‘international firm’ refers to a company that is engaged in a meaningful level of outward international business activity.** The specific measures of this ‘meaningful activity’ and criteria for companies to be classed as international firms in this study are described in the following section.

Considerable ambiguity exists regarding the distinction between the terms ‘internationalisation’ and ‘globalisation’ and between ‘international firm’ and ‘global firm’, with many authors improperly applying the terms synonymously. This ambiguity is echoed in the OECD’s (1997, p21) report on Globalisation and SMEs where they state that “globalisation is a fuzzy, imprecise concept” with “no absolute point on the scale at which firms are or are not globalised”. The OECD (1997) contends that globalisation cannot be measured directly since it encompasses a composite of several dimensions. The organisation defines globalisation as a deeper involvement in internationalisation as measured by the proportion of the firm’s outputs and inputs that are traded across national boundaries, the number of establishments or affiliations in different countries or regions, and the number and range or regions which the firm perceives as being market opportunities or competitive threats. The OECD (1997) defines a global firm as a company having:

- flexibility and the ability to identify and take advantage of opportunities world-wide
- the ability to source inputs, deliver products and services, and move capital across national borders
- no specific home country or national base
- a presence in numerous countries, generally as establishments, alliances or part of a network
- top management that thinks and acts globally

- the ability to successfully market products and/or services in different countries.

Globalisation and global firms can also be differentiated from internationalisation and international firms in terms of the strategy they employ. Global strategy has been characterised as involving product standardisation (Levitt, 1983), economies of scale and scope (Hout et al., 1982; Porter, 1985), cost efficiency and location economies (Hout et al., 1982; Porter, 1984; Kogut, 1985), integration and co-ordination of value-added activities (Bartlett, 1985; Porter, 1985; Yip, 1992), and shared learning experiences (Bartlett and Ghoshal, 1985, 1989). Thus, the distinction between an international firm and a global firm lies in the deeper involvement in international business activity of the global firm, in terms of the characteristics and strategy noted above.

2.1.4 DEFINITION OF AN 'INTERNATIONAL START-UP'

The previous section established the study's definition of an international firm. This section builds on the definition by providing specific definitional parameters and by incorporating the new venture dimension in order to define an 'international start-up', which is the focus of this thesis. The study's definition of an international start-up is largely influenced by that of Oviatt and McDougall (1994), who define the synonymous term 'international new venture' as "a business organisation that, from inception, seeks to derive significant competitive advantage from the use of resources and the sale of outputs in multiple countries". **Similarly, for purposes of this study, an 'international start-up' is defined as a new venture that exhibits an innate propensity to engage in a meaningful level of international business activity at or near inception, with the intent of achieving strategic competitive advantage (Johnson, 2001).**

It can be readily seen that the primary differentiating characteristic between an international firm and an international start-up is the age of the firm when it becomes

international. Whereas firms have traditionally been found to gradually internationalise, as will be detailed in Chapter 3, international start-ups commence with a founding international orientation and strategy, which leads to distinctive early internationalisation. A detailed description and analysis of international start-ups from both theoretical and empirical constructs is provided in Chapter 4.

Before describing the specific criteria for a firm to be classed as an international start-up in the study, it is important to distinguish between the terms ‘international start-up’ and ‘global start-up’, which are often erroneously utilised interchangeably in the literature. Oviatt and McDougall (1994) provide this distinction by defining global start-ups as the most extreme type of international start-up, characterised by the extensive co-ordination of many value chain activities across numerous geographically dispersed countries. Porter (1985, 1986) describes the value chain as the primary organisational activities of inbound logistics, operations, outbound logistics, marketing and sales and service, and the secondary organisational activities of human resource management, technology development and procurement. Thus, the fundamental difference between an international start-up and a global start-up lies in the depth, scope and intensity of the international business activity of the global start-up, which includes the early establishment of foreign-based organisational activities (i.e. foreign value chain activities). As will be described later in this thesis, many of the international start-ups included in this study could be more precisely classified as global start-ups.

While a precise and universally accepted set of definitional criteria for a firm to be classed as an international start-up does not exist, this thesis utilises the following criteria, which are influenced and supported by the work of researchers in this area (for example Oviatt and McDougall, 1994, 1997; Knight, Madsen, Servais and Rasmussen, 2000; Zahra, Ireland and Hitt, 2000). First, the founder(s) of the firm must have had an international vision (i.e. international outlook and aspirations) for the company at or within one year of inception, so as to evidence its founding international intent. Second, the firm must demonstrate its commitment to international activity by conducting business in at least four foreign countries,

including evidence of geographic dispersion measured by at least one country in a different continent than the home country, within five years of founding. Third, international sales must represent a minimum of 20% of total firm revenue over the first five years of the company's international activity, indicating substantive international business intensity. And finally, although not a direct definitional criterion, evidence of foreign value chain activity (e.g. foreign-based sales or service offices) indicating early globalisation efforts is reviewed and regarded as indicative of a higher degree of internationalisation. These definitional criteria are further discussed in Chapter 6.

2.1.5 DEFINITION OF 'INTERNATIONAL ENTREPRENEURSHIP'

International entrepreneurship research, which shares common ground with international start-up research, represents an emerging field of study (McDougall and Oviatt, 1997, 2000). Conversely, the general principles of entrepreneurship have been examined for a much longer period of time (see for example Cole, 1942; Schumpeter, 1949). While many definitions exist, Stevenson and Jarillo (1990) succinctly define entrepreneurship as a process whereby individuals pursue opportunities without regard to resources they currently control. The study of entrepreneurship has been approached from many disciplines, such as psychology, sociology and economics (Low and MacMillan, 1988; Carson et al., 1995). Furthermore, it encompasses a wide range of issues, such as entrepreneurial traits, innovation, opportunity seeking, resources and risk taking (Hart, Stevenson and Dial, 1995; Carson et al., 1995).

Deakins (1999) summarised the literature by identifying the following key characteristics of entrepreneurs:

- Need for achievement
- High propensity for risk taking
- High internal locus of control
- Innovative behaviour

- Need for independence
- Ambiguity tolerance
- Vision

Bolton and Thompson (2000, p22) similarly summarised the literature and identified ten key action roles associated with entrepreneurs and entrepreneurship. They state that entrepreneurs:

- Are individuals who make a significant difference
- Are creative and innovative
- Spot and exploit opportunities
- Find the resources required to exploit opportunities
- Are good networkers
- Are determined in the face of adversity
- Manage risk
- Have control of the business
- Put the customer first
- Create capital

International entrepreneurship is likewise a multidimensional research area, which incorporates the international aspect (Giamartino, McDougall and Bird, 1993). Following an examination of the literature and definitions proposed by leading scholars in the field, **McDougall and Oviatt (2000) defined international entrepreneurship as “a combination of innovative, proactive, and risk-seeking behaviour that crosses national borders and is intended to create value in organisations”**. The study of international entrepreneurship also encompasses the comparison of domestic entrepreneurial behaviour in multiple countries (McDougall and Oviatt, 1997, 2000). Research into international entrepreneurship has included the topics of international entrepreneur characteristics and motivations, international new ventures, international co-operative alliances, and exporting and other market entry modes (McDougall and Oviatt, 1997). International start-ups can clearly be classed as international entrepreneurial firms and each of these identified research topics will be specifically addressed in this thesis.

2.2 FOREIGN MARKET ENTRY MODES

A multitude of alternative methods of entering and servicing international markets is available to firms, including international start-ups. This section identifies and briefly defines these foreign market entry mode options. Additionally, decision factors involved in the firm's selection process will be analysed. The objective of this section is to provide a basic foundation of knowledge so as to enhance the comprehension of subsequent thesis discussions regarding the employment of various international market entry modes by international start-ups.

Table 2.2 outlines a range of international market entry methods available to firms. The eleven entry methods illustrated in the table can be classed as export entry modes (indirect and direct), contractual entry modes (licensing, franchising, management contracts, turnkey contracts, contract manufacturing/international subcontracting, industrial co-operation agreements, contractual joint ventures and strategic alliances) and investment entry modes (equity joint ventures and wholly owned subsidiaries), which is known as foreign direct investment (FDI) (Young, Hamill, Wheeler and Davies, 1989; Root, 1994). These entry modes vary widely in terms of resource commitment, control, risk and motivations for selection.

Entry Mode	Definition
Exporting	Transfer of goods and/or services across national boundaries via indirect (export house, confirming house, trading company, piggybacking, etc.) or direct (agents, distributors, company export salesmen, sales subsidiaries) methods.
Licensing	Contracts in which licensor provides licensees abroad with access to one or a set of technologies or know-how in return for financial compensation. Typically, the licensee has rights to produce and market a product within an area in return for royalties.

Franchising	Contracts in which franchisor provides franchisee with a 'package' including not only trademarks and know-how, but also local exclusivity, management and financial assistance and joint advertising. Management fees are payable. Most important in services.
Management Contracts	An arrangement under which operational control of an enterprise, which would otherwise be exercised by a board of directors or managers elected and appointed by its owners, is vested by contract in a separate enterprise which performs the necessary management functions in return for a fee.
Turnkey Contracts	A contractor has responsibility for establishing a complete production unit or infrastructure project in a host country – up to the stage of the commissioning of total plant facilities. Payment may be in a variety of forms including countertrading.
Contract Manufacturing/ International Subcontracting	A company (the principal) in one country places an order, with specifications as to conditions of sale and products required, with a firm in another country. Typically the contract would be limited to production, with marketing being handled by the principal.
Industrial Co-operation Agreements	Conventionally applied to arrangements between Western companies and government agencies in the Eastern Bloc. Include licensing, technical assistance agreements, turnkey projects and contract manufacturing, as well as contractual joint ventures and tripartite ventures.
Contractual Joint Ventures	Formed for a particular project of limited duration or for a longer-term co-operative effort, with the contractual relationship commonly terminating once the project is complete. May relate to co-production, co-R&D, co-development, or co-marketing.
Strategic Alliances	International corporate linkages in a response to increasing international competition. Especially relevant to smaller and non-dominant firms. May involve licensing and contractual and equity joint ventures.

Equity Joint Ventures	Involves sharing of assets, risks and profits and participation in the ownership (i.e. equity) of a particular enterprise or investment product by more than one firm.
Wholly Owned Subsidiaries	100% owned operations abroad. May be manufacturing or sales/service ventures. May be formed through acquisitions or greenfield operations.

Table 2.2: Foreign Market Entry Modes/Definitions

(Source: Young, Hamill, Wheeler and Davies, 1989)

International strategic alliances warrant special elaboration and discussion due to their recent upsurge and particular relevance to smaller firms (Young et al., 1989), which are the focus of this study. International strategic alliances are co-operative arrangements or collaborations between two or more firms, which are designed to facilitate international market entry and/or expansion (Welch, 1992). The intent is to combine the core competencies of the firms in a long-term alliance in order to promote the international competitiveness of each firm (Simonin, 1999). Key factors influencing the formation of these alliances include the sharing and conservation of resources, reducing intrinsic risk and gaining access to specific international markets (Young et al., 1989). Engaging in international strategic alliances is becoming increasingly prevalent in today's competitive global markets as many firms conclude that "going it alone is no longer a viable option" (Root, 1994, p292). As will be described in Chapter 4, international start-ups characteristically engage in strategic alliances in order to compensate for their small size and inherent resource deficiencies, thereby enabling them to compete in international markets.

Theoretical approaches to the internationalisation of the firm provide an explanation for specific entry mode selection. For example, economic frameworks such as the 'eclectic paradigm' explain a firm's foreign production (i.e. FDI) decision as being based on the perceived ownership, location and internalisation advantages associated with the implementation of the investment entry mode (Dunning, 1977, 1981, 1988, 1993). As a second example, behavioural frameworks such as the 'internationalisation process models' explain a firm's choice of entry mode as a

gradual incremental process beginning with exporting and gradually escalating in foreign resource commitment towards FDI as its experiential knowledge increases and risk perception diminishes (Johanson and Wiedersheim-Paul, 1975; Johanson and Vahlne, 1977). These internationalisation frameworks as well as numerous others will be detailed in Chapter 3.

The selection of a firm's entry mode for a specific product and country market can also be explained by examining the firm's strategic analysis process. Root (1994) identifies external and internal factors that influence a firm's choice of entry mode in their decision process (see Figure 2.1). External factors, which are beyond the control of the firm, include target country market factors (e.g. size, competition, marketing infrastructure), target country environmental factors (e.g. geographical distance, cultural distance, government trade policies), target country production factors (e.g. the availability, quality and cost of raw materials, labour and logistical infrastructure) and home country factors (e.g. its own market, environmental and production factors). Internal factors include company product factors (e.g. levels of differentiation, adaptation and technological intensity, along with servicing requirements) and company resource/commitment factors (e.g. extent of capital, technology, and specialised skills and the willingness to commit them). The collective analysis of these external and internal factors facilitates the rational selection of the most optimal foreign market entry mode for a specific product and country market.

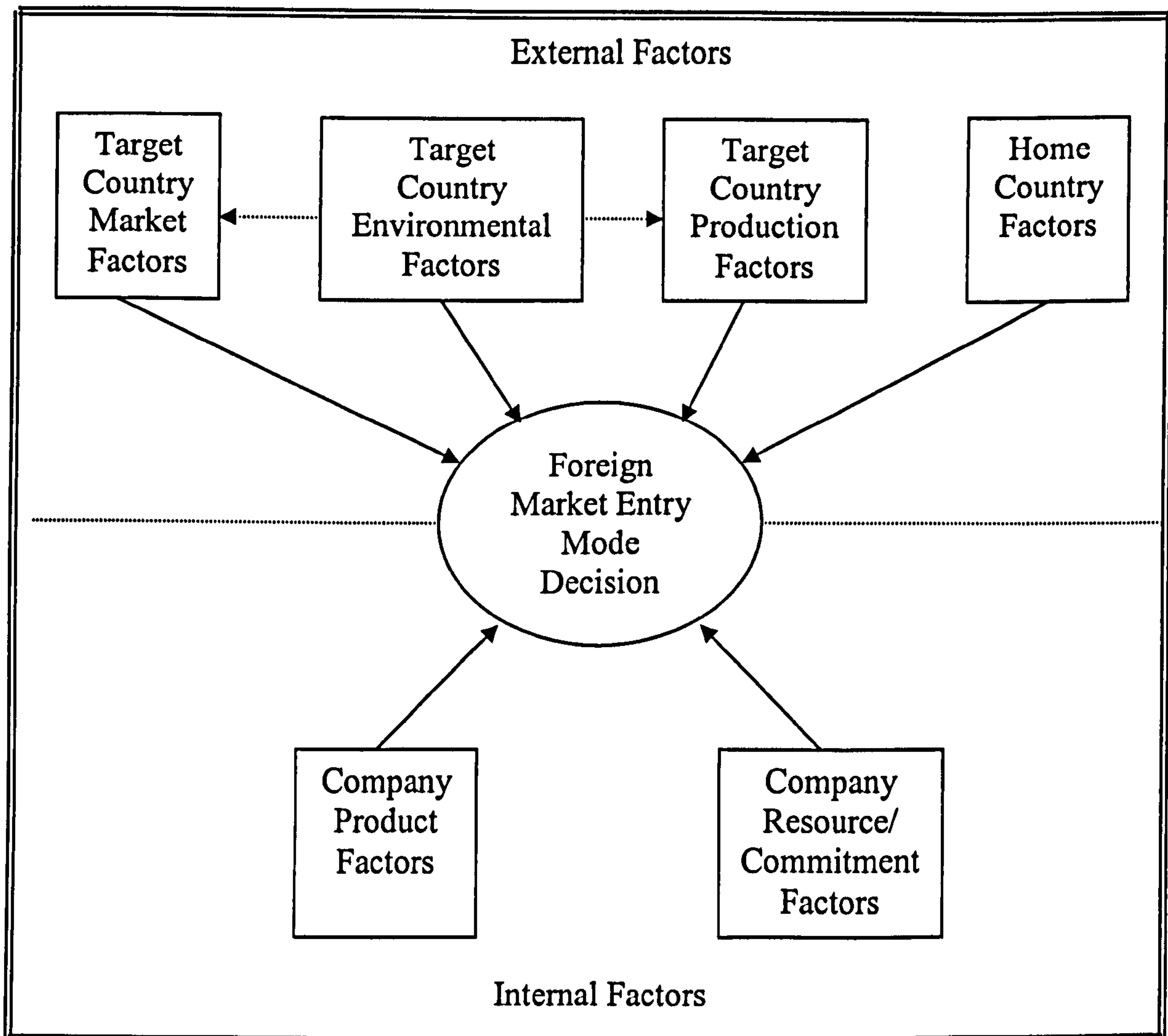


Figure 2.1: Entry Mode Decision Factors

(Source: Root, 1994, p29)

Once the external and internal factors influencing entry mode decisions have been identified, the formal decision process can commence. Figure 2.2 illustrates Root's (1994) depiction of this entry mode decision process. It involves the screening of all possible entry modes by the identified external and internal factors to arrive at a list of all feasible alternatives. The ultimate decision is then based on a rank order of these entry modes by the comparative analysis of each mode's profit contribution, risk and non-profit objectives (e.g. market share target or reputation establishment). In the end, the option that best accomplishes key objectives and represents the most palatable trade-offs will emerge as the foreign market entry choice of the firm. Whereas this entry mode selection process has particular relevance to MNEs, which

typically possess more abundant resources than SMEs and hence have the benefit of additional options, it nonetheless provides insight, albeit limited, into the selection process of smaller firms such as those in the study and is therefore included in this thesis.

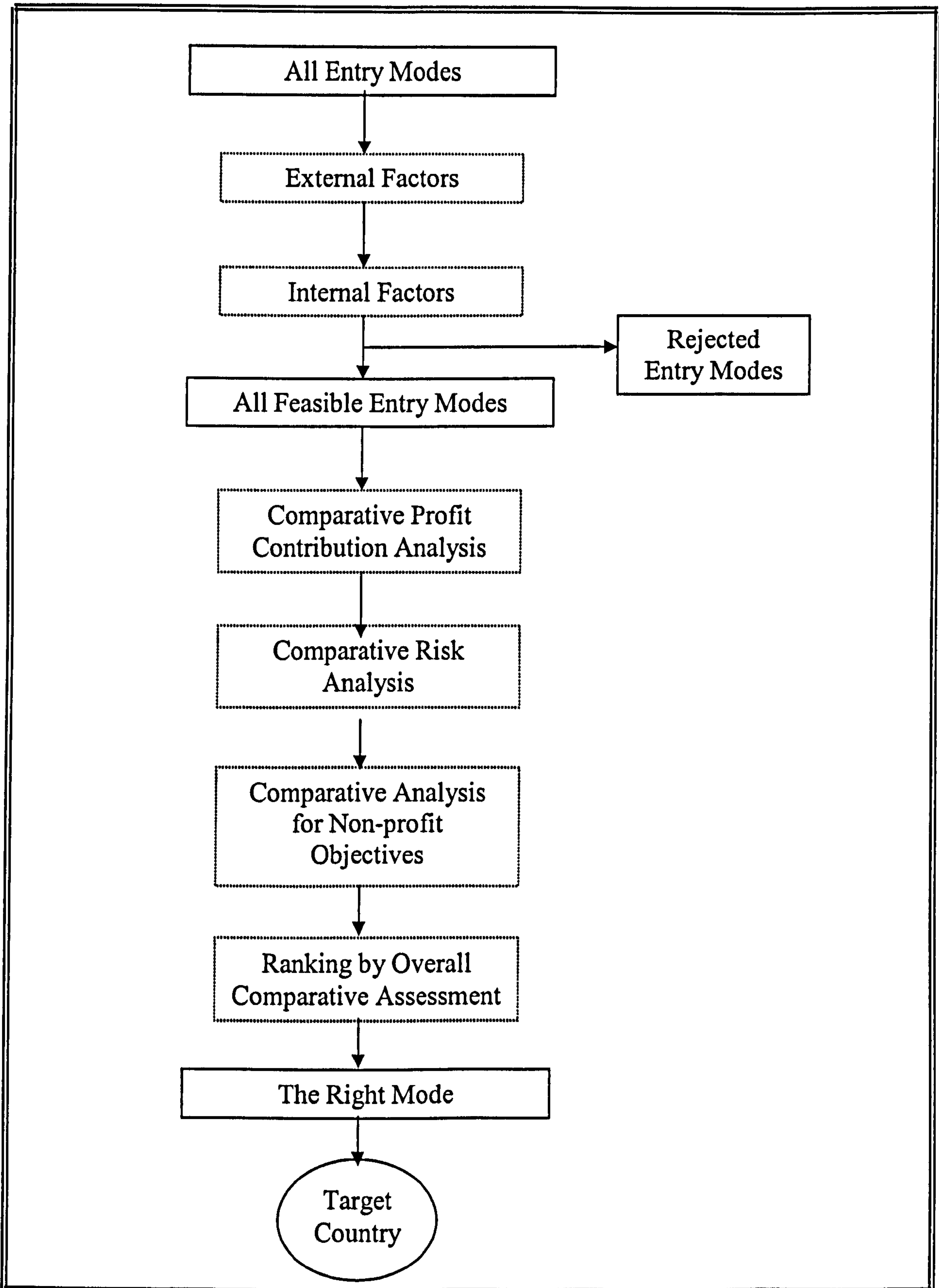


Figure 2.2: Entry Mode Decision Process
 (Source: Root, 1994, p187)

2.3 UK AND US CHARACTERISTICS

This section provides pertinent background data related to the study's two countries, the United Kingdom and the United States, in order to establish their context and facilitate their comparison. The first sub-section highlights key demographic, economic and trade data for the two countries, discussing noteworthy differences. This is followed by a description of cultural and entrepreneurship characteristics, examining similarities and dissimilarities between the two nations. Next, the availability of venture capital in the UK and US is discussed, along with its impact on small high technology start-ups. The final sub-section provides an overview of the study's three sectors, computer software, computer hardware and electronics, describing relevant national data.

2.3.1 DEMOGRAPHIC, ECONOMIC AND TRADE DATA

An examination of UK and US demographic, economic and trade data is vital in order to understand and explain the international activity of the firms in the study. Furthermore, since salient differences exist between the data for the two countries, consideration of important divergences is paramount to the proper comparison of the international activity of the two nations' firms. Consequently, this section will highlight key country data, which is succinctly illustrated in Table 2.3, and discuss their implications for the firms in the study.

Indicators (1999)	UK	US
Population	59.5 million	278.2 million
Surface Area (sq. km)	244.9 thousand	9.4 million
Personal Computers (per 1,000 people)	302.5	510.5
GDP (US\$)	1.4 trillion	9.2 trillion
GDP Growth (annual %)	2.1	3.6
Gross National Income per capita (US\$)	23,590	31,910
Trade (% of GDP, PPP)	44.8	19.8
Exports of Goods and Services (% of GDP)	25.8	11.1
High-Technology Exports (% of manufactured exports)	30.2	34.8
Imports of Goods and Services (% of GDP)	27.5	12.8
Foreign Direct Investment, net inflows (US\$)	84.8 billion	275.5 billion

Table 2.3: 1999 UK and US Demographic, Economic and Trade Data

(Source: World Bank Country Data Profiles, 2001)

As can be readily seen from the table, major demographic differences exist between the two countries. The US has a vastly larger domestic market in terms of population and geographic size, which clearly impacts the economic imperative of internationalisation for US small high technology start-ups relative to their UK counterparts, as well as their rate of internationalisation. The table also points to a far higher prevalence of personal computer ownership per capita in the US, which has important implications relating to market size for the firms in this study since they are in computer software, computer hardware and electronics sectors. A higher rate of personal computer ownership in the US implies a larger domestic market for local firms relative to the UK and suggests a lesser need to pursue international markets early on. Additionally, the imbalance signals an international opportunity (i.e. US market) for UK small high technology start-ups in computer software and computer hardware sectors, which have a smaller domestic market relative to the US.

Table 2.3 similarly illustrates a clear economic imbalance between the two nations. GDP, GDP growth and gross national income per capita are substantially higher in the US than in the UK. These data suggest greater domestic economic opportunity in the US than in the UK and likely impact the necessity and rate of internationalisation of small high technology start-ups in the two countries.

Analysis of trade data for the UK and US is less clear. As illustrated in the table, the UK has a far higher rate of trade (as a percentage of GDP) than the US, both in terms of exports and imports of good and services. This is indicative of the UK's much smaller domestic market and lower GDP. However, and of great relevance to this study, the US has a higher rate of high technology exports (as a percentage of manufactured goods) than the UK. This suggests a competitive advantage of US high technology goods over UK high technology products, perhaps in terms of innovation, which in turn has significant implications for the firms in the study. Finally, the US has a far higher net inflow of foreign direct investment than the UK, which has relevance to the selection of entry modes by the firms in the study and likely stems from the size and attractiveness of the US markets as well as its geographic distance from Europe and Asia.

2.3.2 CULTURE AND ENTREPRENEURSHIP

This study involves an examination of small, independent international start-ups in the UK and US. In order to understand and explain the factors influencing their formation and to properly compare the early internationalisation of the firms in the study, an analysis of differences regarding culture and attitudes towards entrepreneurship is essential. This subsection reviews the similarities and dissimilarities of these two fundamental dimensions between the two countries.

Hofstede's (1980, 1983) seminal work related to national business culture provides insight into the cultural closeness of the UK and US. Hofstede collected data

pertaining to culture through the completion of over 116,000 questionnaires spanning more than 50 countries. He concluded that national culture could be summarised by four dimensions: power distance, uncertainty avoidance, individualism and masculinity. Power distance refers to how society deals with inequalities in people's physical and intellectual capacities. Uncertainty avoidance measures the degree to which people feel threatened by ambiguous situations and how well they tolerate uncertainty. Individualism versus collectivism focuses on the relationship between individuals and the extent to which they only look after themselves and their immediate families (i.e. individualism) or belong to groups that look after each other (collectivism). Finally, masculinity versus femininity refers to the division of gender roles in a society, with masculine societies being more assertive and achievement oriented and feminine societies being more caring and relationship oriented.

Table 2.4 highlights Hofstede's Great Britain and United States findings pertaining to the four cultural dimensions. As can be readily seen from the table, the cultures of Great Britain (i.e. the UK) and the US are quite similar. Hofstede (1983) classifies the cultures of both Great Britain and the US as having small power distance and weak uncertainty avoidance and being very individualist and masculine in nature. While Hofstede's work is dated (data collected in the 1960s and 1970s) and does not therefore reflect recent cultural changes, it nevertheless provides key multidimensional insight into national culture and continues to be highly regarded. Hofstede (1994) later incorporated a fifth dimension, long-term versus short-term orientation, which emerged from a quantitative study involving 23 nations. Long-term orientation is associated with the values of thrift and perseverance, while values associated with short-term orientation include respect for tradition, fulfilling social obligations, and protecting one's "face". Both Great Britain and the US were found to have a somewhat short-term orientation (scores of 25 and 29 respectively). Thus, the findings for the five dimensions suggest that a high degree of cultural similarity exists between the UK and US.

Cultural Dimensions	Great Britain (Scale 0-100)	United States (Scale 0-100)	Mean of all 53 Countries/Regions in Hofstede's Study
Power Distance	35	40	57
Uncertainty Avoidance	35	46	65
Individualism	89	91	43
Masculinity	66	62	49

Table 2.4: UK and US Cultural Dimensions

(Source: Hofstede, 1983)

Hampden-Turner and Trompenaars (1993) also found strong evidence of cultural similarity between the UK and US in their survey involving 15,000 business managers from around the world. The study examined and compared various business cultural attributes across the UK, US, Japan, Germany, France, Sweden and the Netherlands. The authors found a high degree of cultural closeness between the UK and US, spanning numerous business culture dimensions. For example, UK and US managers were both identified as being universalists, analytics, individualists, inner-directed, achievement oriented, moderately egalitarian, and time sequential. Their findings, which were based on data collected between 1986 and 1993, provides a more recent cultural analysis than that of Hofstede (1983).

National attitudes towards entrepreneurship, and more specifically international entrepreneurship, also have roots in culture. Thomas and Mueller (2000) linked entrepreneurship and culture in their nine country quantitative study of national comparative entrepreneurship and culture. They found that the entrepreneurial traits of internal locus of control, moderate risk taking propensity and high energy level decline in frequency as cultural distance from the US increases and that the trait of innovative orientation does not vary with cultural distance. Based on the cultural similarity between the UK and US as described above, Thomas and Mueller's (2000) findings suggest little difference in the prevalence of these entrepreneurial traits across the two nations.

Reynolds, Hay and Camp's (1999) Global Entrepreneurship Monitor study provides more specifics and depth than the Thomas and Mueller study. The research project involved a collaborative effort between London Business School and Babson College to examine the relationship between entrepreneurship and economic growth. The data stemmed from more than 10,000 surveys and over 300 in-depth interviews in ten countries, including the UK and US. The study found that 8.5% of US adults and 3.3% of UK adults were active in business start-ups at any point in time. Based on this national prevalence of start-up data as well as national personal financial support data, which is impacted by cultural norms, the authors classified the US as having a high level of entrepreneurial activity and the UK as having a medium level.

Reynolds et al. (1999) found the following six factors to be significantly associated with start-up rates: entrepreneurial opportunity, entrepreneurial capacity, infrastructure, demography, education and culture. The authors contend that these six factors explain the differences in entrepreneurial activity between countries. They concluded that the US was highly capable of recognising entrepreneurial opportunities relative to the UK, finding 57% of the US population perceiving good start-up opportunities, compared to only 16% of the UK population. The US was also found to have a much higher entrepreneurial capacity than the UK, largely due to greater developed entrepreneurial education and skills. While the US has a strong infrastructure supporting and encouraging the pursuit of entrepreneurial opportunities, the UK infrastructure was found to be "more than adequate for the existing level of entrepreneurial activity" (Reynolds et al., 1999, p35). Furthermore, the authors posit that the high rate of start-ups in the US stems from its strong entrepreneurial culture and the value its people place on entrepreneurship and independent business, as opposed to the UK where they found that most people considered starting a business to not be a respected occupation. Reynolds et al.'s (1999) extensive study starkly identified vast differences in the attitudes towards entrepreneurship between the UK and US, which has clear implications for the prevalence of international start-ups in the two countries.

2.3.3 VENTURE CAPITAL

Funding is a critical issue for small high technology start-ups, which greatly impacts their ability to develop, conduct crucial R&D, and grow (Roberts, 1991). Internal equity and profits are almost always insufficient to meet the capital requirements of these firms, thus requiring the firms to seek external financing and investment capital (Oakey, 1984). However, due to the high level of risk associated with small high technology start-ups, securing external equity finance is problematic (Moore, 1994).

The availability of venture capital funding for small high technology firms varies widely between the US and UK, which has major implications for the establishment, development and ultimately the success of the firms in this study. In the US, venture capital represents a dominant and important source of financing for high technology start-ups (Freear and Wetzel, 1990; Rizzoni, 1991; Murray and Lott, 1995). Conversely, the UK venture capital industry has historically been reluctant to invest in high technology firms due to their inherent risk and high failure rate (Sweeting, 1991; Mason and Harrison, 1992; Moore, 1994; Murray and Lott, 1995). Furthermore, corporate venture capital investment in high technology firms is far greater in the US than the UK, with UK corporate interest being minimal in relation to that of the US (Botkin and Matthews, 1992; Block and MacMillan, 1993; McNally, 1994, 1995).

However, according to the British Venture Capital Association's Report on Investment Activity (2000), the UK venture capital industry is the largest and most developed in Europe and second in world importance only to the US. The report further states that over £1.6 billion was invested in 772 UK high technology firms in 2000 with 47% of these at start-up or early stages in their development, which represent new records. Moreover, Hood (2000) highlights the shift in focus of public venture capital in Scotland towards early stage financing of high technology firms during the 1990s.

2.3.4 BACKGROUND TO SECTORS

This research project involves high technology firms in computer software, computer hardware and electronics sectors. The objective of this section is to provide brief backgrounds to these sectors in the UK and US, so as to render perspective and facilitate comparison. The data presented in the section was largely derived from the OECD's (2000) report on the measurement of the Information and Communication Technologies (ICT) sector, which encompasses the study's three sectors. Table 2.5 illustrates key UK and US data outlined in the report. The ICT data presented includes manufacturing and services in International Standard Industrial Classification (ISIC) classes covering the three sectors of this study. Telecommunications data has been intentionally removed from the analysis in order to focus on computer software, computer hardware and electronics ISIC classes. It is important to note that the data in the table does not include all possible SIC codes related to the study's three sectors, but nevertheless provides a broad spectrum for analysis and a sound basis for comparison.

	UK Manufac- turing ICT	UK Other ICT Services	US Manufac- turing ICT	US Other ICT Services
Number of Enterprises (1997)	7,145	84,370	15,676	118,277
Employment (1997)	302,896	615,964	1,587,300	1,699,105
Production (1997; million US\$, PPP)	50,783	138,786	421,670	438,430
R&D (1997; million US\$, PPP)	1,421	1,045	44,154	13,745
Imports (1998; million US\$, PPP)	54,307	747	173,804	505
Exports (1998; million US\$, PPP)	51,206	2,626	139,164	3,992

Table 2.5: UK and US Information and Communication Technologies Sector Data

(Source: OECD, Measuring the ICT Sector, 2000)

As illustrated in the table, vast differences exist between the UK and US ICT sectors in terms of number of enterprises, employment, production, R&D, imports and exports. Based on the demographic data variation discussed in Section 2.3.1, the substantially larger US figures are readily explainable. However, the magnitude of the deviation between R&D expenditures for the ICT sector in the two countries is particularly noteworthy and has implications for this study, since it involves innovation-oriented start-ups. R&D intensity, as measured by R&D expenditures as a percentage of value added, was 7.5% for UK manufacturing ICT and about 3% for UK ICT services in 1997, as opposed to approximately 26% and 7% for the US respectively. The OECD (2000) report states that the R&D intensity for UK ICT manufacturing is low compared to other large OECD countries and exceptionally strong for US ICT manufacturing.

2.4 SUMMARY

This chapter provided the requisite backdrop to the thesis in terms of fundamental definitions and background to the study's countries. The precise definitions to the terms 'small firm', 'high technology firm', 'international firm', and an 'international start-up' as applied in this thesis were presented and discussed, along with the definition of 'international entrepreneurship'. Definitions of foreign market entry modes as well as a description of entry mode decision factors and the decision process followed. The remainder of the chapter focused on UK and US characteristics, specifically demographic, economic, trade, culture, entrepreneurship, venture capital and sector data. Similarities and dissimilarities were highlighted along with a discussion of the implications for the firms in the study. Having provided the definitions and backgrounds, thereby establishing the contextual stage and facilitating both explanation and comparison, the review of literature can now proceed.

CHAPTER 3

INTERNATIONALISATION OF THE FIRM

INTRODUCTION

This chapter reviews and evaluates a range of theoretical approaches to the internationalisation of the firm with the intent of seeking explanations for small firm internationalisation. The internationalisation of small firms is unique due to the implications of their common resource constraints and frequent lack of both international knowledge and international experience on internationalisation decisions such as choice of entry mode and country market selection. The purpose of this chapter is to provide a broad overview of prominent theoretical approaches to the internationalisation of the firm in an effort to facilitate an understanding of both the internationalisation of small firms and ultimately the internationalisation of small international start-ups, which will be developed in Chapter 4.

The chapter begins with brief synopses of five early theoretical frameworks in order to provide a historical perspective to multinational theory. This is followed by an overview of three rational, economic approaches providing insight into multinational enterprise activity: the transaction cost approach, internalisation theory and the eclectic paradigm. Then, the resource-based perspective as applied to internationalisation is reviewed. Next, the focus shifts to behavioural approaches to internationalisation, beginning with network approaches, including an analysis of how inward internationalisation can lead to outward internationalisation. Finally, internationalisation process models are delineated and examined. The format of the chapter is to describe the principal tenets of each of these six theoretical approaches and provide an analysis and critique. The implications and applicability of each approach to the internationalisation of small firms will then be analysed.

3.1 ECONOMIC APPROACHES TO INTERNATIONALISATION

This section examines three linked economic approaches to internationalisation: the transaction cost approach, internalisation theory and the eclectic paradigm. Illustrating economic approaches provides a framework for analysing internationalisation from a rational, cost and investment perspective. While each of these economic approaches is highly regarded academically, they hold greater explanatory ability for MNE activity than for small firm internationalisation due to the implications of the limited resources typically possessed by small firms, which in turn limit FDI options. Nevertheless, the section provides an overview of these three economic approaches and focuses on their ability to enhance the overall understanding of small firm internationalisation.

However, before commencing with the overview of the six stated theoretical approaches to the internationalisation of the firm, the following antecedent theory frameworks will be very briefly identified and described: the market imperfection approach, monopolistic advantage theory, market power approach, oligopolistic reaction theory and the product cycle theory. The objective for the inclusion of these additional theories and frameworks is to provide a historical context to the economic approaches to multinational enterprise that will be described in the section.

The market imperfection approach recognises the absence of perfect domestic and international markets and its subsequent influence on a firm's behaviour and strategy, leading to the basis of its competitive advantage. Hymer (1976) contended that product and market factor imperfections allow a firm to achieve advantages such as economies of scale, superior technology or superior knowledge, differentiated products, brand names, and production and management skills. The approach holds that a firm's decision to invest abroad can be explained as an undertaking designed to capitalise on these advantages or capabilities, which are not shared by local competitors. As an extension to this approach, Hymer's (1976) monopolistic advantage theory holds that the international exploitation of this unique firm superiority or monopolistic advantage over indigenous firms results in foreign direct

investment (FDI), explaining the existence of MNEs. Caves (1971) expanded the monopolistic advantage theory by positing that firms can exploit their superior abilities (monopolistic advantages) in foreign markets at a negligible cost over that incurred in their exploitation of the same advantages in their home markets. In this sense, the monopolistic advantage theory views internationalisation as expansion into international markets in an effort to generate additional revenue from expenditures associated with the development of home market superior abilities or monopolistic advantages. While the market imperfection approach and monopolistic advantage theory provide valuable insight into the internationalisation of the firm, they hold greater explanatory ability for MNE evolution than for small firm internationalisation due to its emphasis on FDI, which often requires greater resources than those typically possessed by small firms.

The market power approach to internationalisation is likewise rooted in the work of Hymer (1976). The author posited that firms initially develop and grow domestically by increasing their market share through mergers and capacity extensions and that profits increase through the ensuing market power, which is the domination resulting from industrial concentration. When further domestic market concentration is not feasible the remaining firms invest their profits in international operations, ultimately leading to increasing levels of foreign market industrial concentration. Thus, Hymer viewed internationalisation to be driven by a producer's desire to increase its market power by expanding into international operations by means of merger, collusion and capacity extension. Once again, this approach to internationalisation has higher explanatory value for MNE activity than for small firms due to their smaller scale of operations and inability to dominate markets and invest in extensive FDI.

The oligopolistic reaction theory is largely associated with the work of Knickerbocker (1973). The author postulated that firms in an oligopoly internationalise in reaction to their competitors' internationalisation, as a defensive strategy. A firm imitates its competitors by rapidly matching their FDI initiatives in particular international markets in an effort to reduce the risk of being different and avoid losses arising from not following their rivals. Being in the same international

markets as its competitors allows a firm to quickly respond to price cuts and other competitive actions. As a result of this response potential, competition is reduced and the market becomes stable, which Graham (1975, 1978, 1985) refers to as an “exchange of threat” motivation. The oligopolistic reaction theory thus provides an explanation for the internationalisation of an industry’s oligopolists as well as the clustering of their foreign investments. However, the theory’s focus on oligopolies and FDI holds virtually no relevance to small firm internationalisation.

Finally, the product cycle theory provides an explanation for export and foreign production location decisions based on the life cycle of a product as it moves from introduction→ growth→maturity→decline (Vernon, 1966). The theory holds that when a product is in the ‘new’ stage it is generally produced and consumed domestically and subsequently accompanied by exporting, but as the product ‘matures’ competition spurs production cost concerns, leading to a decision to invest in foreign production in advanced nations. As the product becomes ‘standardised’, competition is largely cost-based, leading to decisions to move production to developing countries with lower labour costs. While the product cycle model provided a useful explanation for the 1950s and 1960s growth of US production investment in advanced nations, Vernon (1979) later acknowledged that the explanatory power of the model had diminished due to changes in the international environment. Giddy (1978) likewise argued that the model had lost relevance and criticised it for failing to address the strategic issue of why the MNE would choose to use an investment entry mode as opposed to licensing or other alternatives. Furthermore, the model is static in nature rather than dynamic and does not show how firms maintain competitive advantage. Although the theory renders insight into production location decisions, it provides limited value to the explanation of small firm internationalisation due to the impact of restricted resources on FDI decision-making.

3.1.1 TRANSACTION COST APPROACH

The roots of the transaction cost approach extend back to Coase (1937) and while the author did not utilise the term 'transaction cost' in his work, he is generally recognised as the founder of transaction cost economics (Dietrich, 1994). However, the development of the transaction cost approach is more widely attributed to the work of Williamson (1975, 1981, 1983, 1985). Transaction cost analysis involves a study of organisations derived from the disciplines of economics, organisation theory and contract law. The essence of this economic study of organisations, focusing on the principles of transaction cost minimisation and efficiency, is best stated in Williamson's general proposition that "governance structures that have better transaction cost economizing properties will eventually displace those that have worse, *ceteris paribus*" (Williamson, 1981, p574). Hence, the approach analyses transaction costs as the basis of organisational governance structure decisions between market and internal firm structures, or markets versus hierarchies, with the determination predicated on the least cost alternative.

Williamson (1981) contended that transaction costs (e.g. negotiation, contract construction and dispute settlement costs) are influenced by the agents' human behavioural characteristics of bounded rationality and opportunism, which lead to contracting problems. Williamson (1981) identifies asset specificity as another important dimension for describing transaction costs. Asset specificity, which represents specialised investments solely applicable for a particular transaction, can arise in terms of site, physical asset or human asset specificity. Transaction costs arise as a result of imperfections in intermediate product markets. The transaction cost approach holds that when these costs reach a certain level, it is beneficial to internalise the transactions rather than trade externally in the open market. Thus, the approach provides an explanation for vertical integration. Additionally, Shan (1990) posits that the transaction cost approach provides a foundation for the understanding of inter-firm co-operative arrangements, which may provide a more efficient organisational mechanism, such as with transactions involving specialised assets. A more recent application of the transaction cost approach involves the choice of

foreign market entry modes, although conclusions regarding selection often differ when utilising transaction cost minimisation criteria and other decision criteria such as value, which is utilised in the organisational capability perspective (Anderson, 1997; Madhok, 1997).

While the transaction cost approach yields valuable insights into firm internalisation processes, it lacks a direct internationalisation dimension. Although commonly applied to the study of firm internationalisation, Casson (1992) points out that it fails to specifically address the issue of multinationality. Casson posited that the transaction cost approach as expounded by Williamson is only of value regarding physical intermediate products and is more applicable to domestic linkages than to international linkages. Casson also contended that Williamson's framework lacked generality and analytic ability, specifically with regards to innovating firms and their research and development (R&D) linkages, due to the approach's emphasis on asset specificity. Technology and knowledge gained through R&D efforts provide economies of scope and benefit a wide range of users and activities, thus deviating from Williamson's principle of specificity to particular users. Casson's criticism related to innovating firms and R&D linkages is particularly relevant to the study of international start-ups since, as will be detailed in Chapter 4, international start-ups are frequently innovation oriented. Despite these shortcomings, the approach's transaction cost economising principles enhance the understanding of firm integration decisions in both domestic and international contexts. Thus, the transaction cost approach possesses limited explanatory capabilities regarding a firm's internationalisation and globalisation processes.

In addition to the shortfalls noted by Casson, the transaction cost approach has been the subject of further criticism. For example, Kay (1991) claimed that the approach is not generally applicable and is significantly flawed in terms of its internal logic and empirical relevance. Kay's resource-based or supply side analysis of transaction cost explanations of multinational enterprise concluded that the transaction cost perspective developed by Buckley and Casson (to be delineated in Section 3.2.2) is

more applicable to multinationality and challenges the claim that transaction costs explain the existence of multinational enterprise.

Dietrich's (1994) criticism of transaction cost economics and the transaction cost approach encompassed many dimensions. Dietrich contends that it fails to consider a firm as a production-distribution unit, thereby precluding an explanation of the existence of the firm in terms of transaction costs. Dietrich further argues that it erroneously assumes that market-based resource allocation is always possible, does not recognise logical problems associated with the central role of opportunism and does not consider the problematic nature of production costs as linked with contracting.

Finally, Ghoshal and Moran's (1996) critique of the transaction cost approach blatantly states that practical applications of the approach are wrong, dangerous and "bad for practice". The authors focused their criticism on Williamson's work and contended that while the approach has merit as a positive theory, it has very limited applicability for normative purposes. They caution corporate managers against applying the approach to their organisations since they believe that it has limited usefulness due to its static nature, strong assumptions and profound stylisation. The authors' primary argument is that organisations are not simply substitutes for structuring efficient transactions in times of market failure, but rather possess unique organisational advantages.

3.1.2 INTERNALISATION THEORY

Internalisation theory is rooted in Coase's (1937) criticism of neo-classical trade and investment theory. The basic principle of internalisation theory is that when transaction costs associated with administered or co-operative production exchange are lower than arm's-length market production exchange, the market is internalised through common ownership and control, thereby enhancing the collective efficiency of the group (Cantwell, 1991). Simplistically restated, when production transactions

can be conducted at a lower cost within a firm than in the market, they will be internalised by the firm (Hood and Young, 1979). Thus, internalisation theory can be regarded as an extension of the transaction cost approach. Cantwell (1991) asserts that internalising production has the potential of reducing transaction costs associated with information impactedness, opportunism, bounded rationality and uncertainty. Casson (1992) describes internalisation as the process of minimising transaction costs generated by market imperfections in intermediate product production by bringing interdependent activities under common ownership and control, thereby explaining the existence of multi-plant firms. Modern internalisation theory as applied to international production is largely credited to the work of Buckley and Casson (1976), although it was first applied to international business by Hymer (1968). The subsequent development of the internalisation approach is mainly attributed to the work of Buckley and Casson (Buckley, 1988; Buckley, Pass and Prescott, 1990; Casson, 1992) and Rugman (1981, 1986).

Buckley and Casson (1976) extended Coase's theorem of internalisation into a theory of multinational enterprise. Buckley and Casson (1976) contend that the internalisation of intermediate product production within an organisation in an effort to maximise profits, while extending beyond national borders, provides the basis for the existence of multinational enterprise. Rugman (1981) builds on Williamson's 'markets and hierarchies' approach to explain the existence of multinationals. Rugman defines internalisation as the process of creating a market within a firm whereby internal pricing allows the internal market to function as efficiently as an external market would. Buckley (1988, p181) bases the internalisation approach to modern multinational enterprise theory on two general propositions: 1) "firms choose the least cost location for each activity they perform, and 2) firms grow by internalising markets up to the point where the benefits of further internalisation are outweighed by the costs".

Buckley, Pass and Prescott (1990) view firms as internalised bundles of resources that can be allocated between product groups (conglomerate diversification) and national markets (multinational diversification). They posit that the growth of a firm

relative to markets is tied to its internalisation decisions. According to the authors, firm growth is accomplished by replacing or creating neighbouring markets in accordance with a positive balance between internalisation benefits and costs. The authors contend that the growth of the firm is determined by its superiority over the market. The aims of internalisation are to enhance profits and to serve as a strategic weapon. They contend that internalising key inputs, such as technology, can equate to a significant entry barrier into an industry. Furthermore, internalisation enables both international transfer price manipulation, which can provide tax benefits, and elimination of the need for potentially disadvantageous bilateral bargaining.

Internalisation theory provides an explanation for vertical integration of tangible intermediate product production in multinational enterprise. Furthermore, it provides an explanation for both vertical and horizontal integration for intangibles such as unique knowledge gained through R&D efforts (Cantwell, 1991; Casson, 1992). Casson (1992) explains that within innovating firms R&D and production activities are vertically integrated, while the dissemination of the technological knowledge output provides benefit to multiple plants, thereby leading to horizontal integration in production.

The contribution of internalisation theory lies in its international application of the transaction cost approach, focusing on the benefits of both location and internalisation, leading to an explanation for multinational enterprise. The implication of the theory is that firms become multinational (i.e. own and control foreign production) and grow through internalisation of intermediate product production, based on the principle of least cost location. Although internalisation theory has been applied to SME internationalisation (e.g. Wheeler, Jones and Young, 1996), it lacks substantive explanatory value for the internationalisation of small firms due to its emphasis on foreign direct investment (FDI) of production, which is often beyond the resource capabilities of smaller firms.

While the internalisation theory has engendered criticism, it has successfully endured challenges (Graham, 1992). The criticism begins from two key authors of the theory,

Casson and Buckley. Casson (1992) states that internalisation theory has been both trivialised and over-sold, while Buckley (1988) acknowledges the problematic nature of testing the theory without placing restrictive assumptions on it. Although internalisation theory is highly regarded by many scholars as an explanatory tool for multinational enterprise, other authors argue that it has shortcomings. For example, Madhok (1997) contends that the organisational capability perspective of firms is superior to internalisation theory since it focuses on future capabilities and shifts the orientation from transaction cost minimisation to value when analysing governance structure decisions. Despite the criticism and challenges, internalisation theory nevertheless provides a high level of explanatory value for the existence and growth of multinational enterprise.

3.1.3 THE ECLECTIC PARADIGM

The eclectic paradigm, which is based on the work of Dunning (1977, 1981, 1988, 1991, 1993, 2000), offers a holistic framework enabling the identification and evaluation of drivers and growth factors of foreign production. Drawing on theories of international trade and production such as the market imperfection approach, monopolistic advantage theory and the product cycle theory, the eclectic paradigm provides an analytical framework for the determinants of international production, focusing on foreign direct investment, at both microeconomic and macroeconomic levels. The primary tenet of the paradigm is that the extent, form and pattern of foreign production are determined by a firm's perception of three sets of forces: ownership (O) advantages, location (L) advantages and internalisation (I) advantages. The paradigm holds that a firm's decision to engage in international production is conditional on the possession of all three sets of advantages. Dunning (1991) argues that the importance of each of the advantages as well as the configuration between them varies among industries, countries and firms. The following paragraphs will describe each of these advantages and their contribution to the explanation of MNE foreign production.

Dunning's (1977) early work on the eclectic paradigm proposed the utilisation of an integrated theory approach to international economic involvement based on location-specific and ownership-specific endowments. The intent was to provide an explanation of MNE foreign production activity based on advantages gained through the internalisation of markets. Dunning (1981) further developed the paradigm by positing that involvement in international production was conditional on a firm's perception of three sets of advantages: ownership, location and internalisation (OLI).

Ownership advantages are tangible or intangible firm-specific assets that enable a foreign producer to achieve competitive advantages over indigenous firms. Examples of these internal firm assets or resources include proprietary technology, patents, experience and unique skills. These competitive or monopolistic advantages, which are specific to the nature or nationality of their ownership, must be of sufficient magnitude to compensate for the expense of setting up and conducting foreign production operations (Dunning, 1988).

Dunning (1983a, 1983b) later distinguished between two types of MNE ownership advantages: asset and transaction. Asset advantages are derived from the ownership of firm-specific assets, such as unique technology, which provide advantages over other firms, while transaction advantages secure transactional benefits (i.e. transaction cost reduction) through the common governance and co-ordination of a network of internationally dispersed assets. Dunning (1988) contends that it is widely acknowledged that the most successful MNEs are those that are able to collectively develop and exploit both asset and transactional ownership advantages.

Location advantages involve the "where" variable of production. Dunning posits that a firm will engage in international production in a particular country when it perceives advantages for doing so, after completion of a risk/reward analysis. He contends that the choice of location may be impacted by spatial market failure such as the imposition of trade barriers or by cost/revenue considerations. Dunning (1981, 1993) asserts that measures of location advantage include consideration of investment incentives and disincentives, cultural similitude, transportation and

communications costs, market infrastructure, economics associated with the centralisation of R&D, production and marketing, and the capacity to lessen production costs.

Internalisation advantages arise when it becomes more advantageous for a firm to engage in international production within its own organisation rather than in the external market. The advantages stem from transaction cost savings associated with internalising foreign production. Thus, internalisation advantages are the perceived transaction cost savings benefits achieved by internalising the markets for its ownership-specific advantages (Dunning, 1991).

The principal contribution of the eclectic paradigm lies in its provision of a multi-dimensional organising framework of international business principles, which facilitates the understanding of international production decisions. However, the paradigm is largely applicable to MNEs and provides lesser explanatory value for small firms since FDI is often a severely limited option due to resource constraints. The eclectic paradigm is best summarised in Dunning's own words:

“It is then the juxtaposition of the ownership-specific advantages of firms contemplating foreign production, or an increase in foreign production, the propensity to internalise the cross-border markets for these, and the attractions of a foreign location for production which is the gist of the eclectic paradigm of international production.” (Dunning, 1988, p5).

While the eclectic paradigm has received much attention and recognition as an analytical framework for the determinants of international production, it has been subjected to extensive criticism. For example, Young et al. (1989) described the paradigm as being static in nature and lacking dynamism. Johanson and Vahlne (1990) contend that it fails to consider timing issues, is static and assumes that decision makers have access to perfect information. Finally, Andersen (1997) asserts that the paradigm's utilisation of three sets of international production conditions

leads to overlapping explanations and redundancies as well as creates problems when analysing and interpreting interrelationships among determinant factors.

Dunning acknowledges much of the criticism directed towards the paradigm and accepts that due to its generality it only possesses limited ability to explain or predict particular kinds of international production and even less ability to explain the behaviour of individual firms (Dunning, 1988). Dunning (1991) defends the paradigm by stating that it should be regarded as a framework for analysing international production determinants rather than as a predictive theory of multinational enterprise. While recognising the limitations of the eclectic paradigm, Dunning argues that it remains “a robust general framework for explaining and analysing not only the economic rationale of international production but many organisational and impact issues relating to MNE activity as well” (Dunning, 1988, p24).

3.2 RESOURCE-BASED PERSPECTIVE OF INTERNATIONALISATION

The resource-based perspective applied to internationalisation focuses on a firm’s ability to acquire and maintain resources as a means of both establishing international competitive advantage and facilitating its survival and growth. The possession of firm-specific resources such as capital, brand names, proprietary technology, superior processes, personnel and networks provide capabilities that can in turn lead to competitive advantage and the expansion of the firm (Wernerfelt, 1984; Grant, 1991). These resources and capabilities can be derived from within a firm or outside a firm. Small start-up firms, such as those researched in this thesis, are often resource impoverished and look outside the firm for obtaining critical resources. For example, a small, young firm may enter into a strategic alliance or network relationship in order to compensate for an internal resource deficiency, such as a lack of R&D capital, and in the process build or leverage competences. The resource-based perspective emphasises the building and leveraging of competences

through continual organisational learning and a “state of perpetual corporate entrepreneurialism” (Sanchez, Heene and Thomas, 1996).

The core constructs of the resource-based perspective have been studied for many years. Penrose (1959) emphasised internal firm resources, for example management experience, as essential determinants of firm growth. Rumelt (1984) characterised a strategic firm as a bundle of linked resources coupled with resource conversion activities. Wernerfelt (1984) looked at firms in terms of their resources as opposed to their products and posited that a firm’s optimal growth involved a balance between the exploitation of existing resources and the development of new resources. Mahoney and Pandian (1992) studied the resource-based perspective within the context of strategic management and concluded that “the resource-based approach provides an illuminating generalizable theory of the growth of the firm.” Finally, Peteraf (1993) contended that a major contribution of the resource-based model is its provision of an explanation for differences in long-term profitability among firms experiencing similar industry conditions.

Barney (1991) researched sources of sustained competitive advantage by coupling the resource-based perspective with the principles of strategic management. Figure 3.1 illustrates his resource-based framework for analysing the potential of firm resources to become sources of sustained competitive advantage. The model begins with the underlying assumptions that strategic resources are heterogeneously distributed across firms and that they are immobile. The model then delineates the four empirical indicators of the potential of firm resources to achieve sustained competitive advantage: valuable resources, rare resources, imperfectly imitable resources and non-substitutable resources. Teece, Pisano and Shuen (1997) similarly applied the principles of strategic management and the resource-based perspective to develop a dynamic capabilities model, which provides a method for analysing the way that firms acquire and retain their competitive advantage.

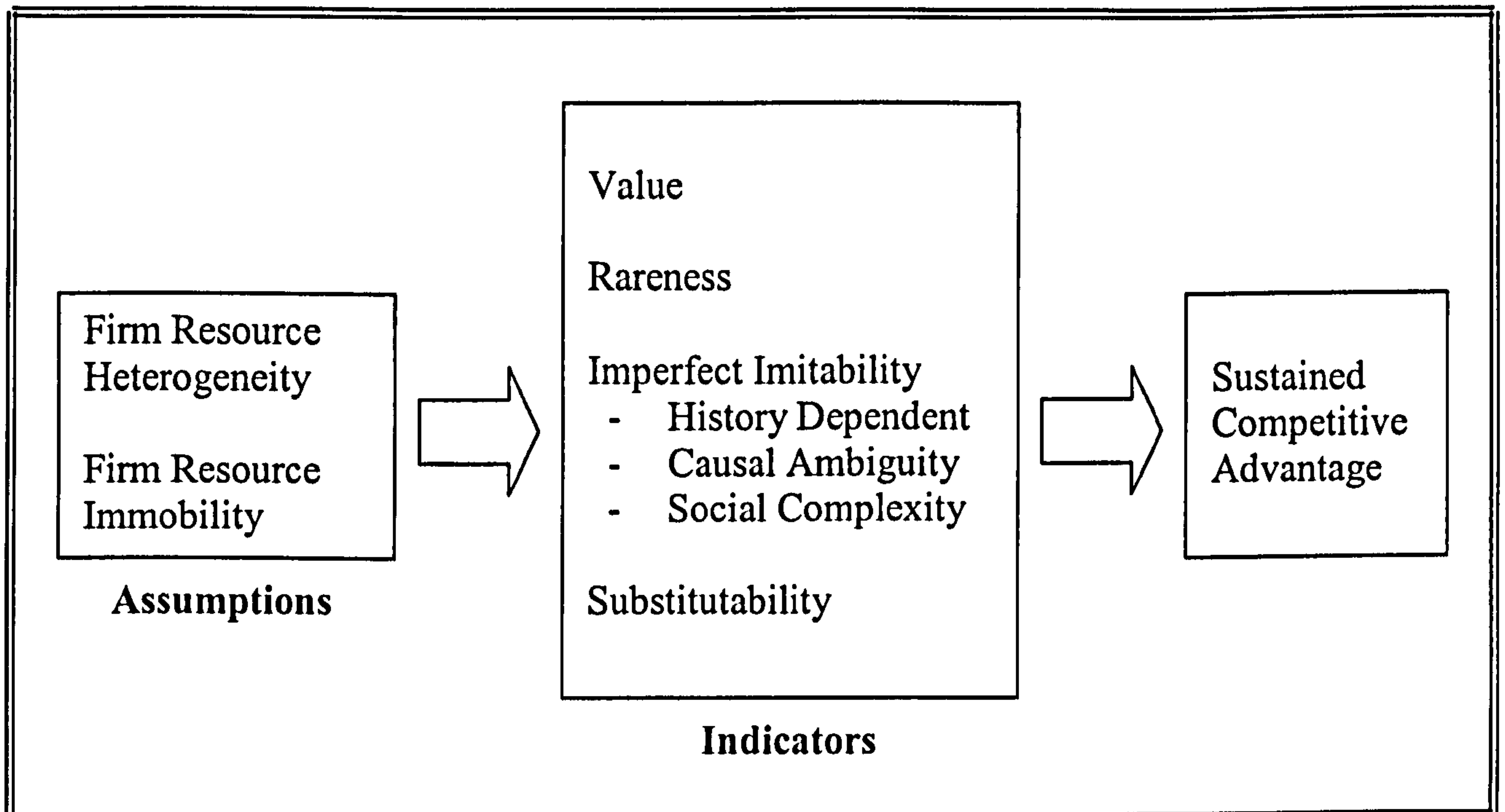


Figure 3.1: Firm Resources and Sustained Competitive Advantage Framework
(Source: Barney, 1991, p112)

The resource-based perspective not only has relevance and applicability to the growth of small firms, but also their internationalisation processes. Wernerfelt's (1984) resource-based view of the firm included the recognition of both international contacts as a valuable resource and the role played by international market diversification in new resource building. Young, Bell, and Crick (1998) argue that initial country market and entry mode decisions are based on the intended exploitation of firm competences, such as proprietary technology, niche products and customer access, within resource constraints. Since small firms generally lack key resources, they often depend on external networks to facilitate international growth and expansion and may enter into alliances to offset these deficiencies and in the process build or leverage competences. Young et al. (1998) state that internationalisation for many small high technology firms is a requirement for success. As will be described in Chapter 4, small international start-ups are often high technology oriented. The authors further posit that the international operations of these small high technology firms become a source of resources and capabilities and that resource deficiencies do not impede the internationalisation process, but

rather represent a challenge that must be surmounted. Kay (2000) also points to the potential contribution of the resource-based perspective to the study of multinational enterprise. He argues that the approach is useful for analysing the alternative directions of expansion, both domestic and international, that firms may pursue. Kay (2000) also links the resource-based perspective with the transaction cost approach, arguing that all strategic moves involve both a direction and mode and that while the resource-based perspective helps with the analysis of the directions of expansion, the transaction cost approach must be utilised to properly analyse the modes of expansion.

The resource-based perspective has been empirically tested and supported. For example, Chandler and Hanks (1994) conducted a study of 155 small, young, US manufacturing companies, researching resource-based capabilities and venture performance. Their findings showed that firms with higher and broader levels of resource-based capabilities grew faster and had higher business volumes. They concluded that an abundance of resource-based capabilities is significantly related to new venture performance. Whereas this is intuitively obvious, the study nevertheless provides further support for the resource-based perspective.

The resource-based perspective provides an explanation for a firm's performance based on its ability to secure and maintain resources. Andersen and Kheam (1998) applied the resource-based approach to their exploratory study of the international growth strategies of small and medium-sized Norwegian exporting firms. Nevertheless, relatively little work has been done on its applications to small firm internationalisation and development, despite its rich potential. Analysing small firm internationalisation in terms of its resources and capabilities engenders an insightful vantagepoint. The accumulation and conservation of resources coupled with competence leveraging is at the heart of virtually all small firms' internationalisation strategies, and play an integral role in international strategic decisions. Thus, the resource-based perspective facilitates the understanding of small firm internationalisation. Specific applications of the resource-based perspective to small international start-ups will be detailed in Chapter 4.

3.3 NETWORK APPROACHES TO INTERNATIONALISATION

Network approaches to internationalisation offer a behavioural perspective of a firm's involvement in international business. Networks can be viewed as sets of connected exchange relationships between customers, suppliers, competitors, social contacts and family members, while markets in this context can be described as systems of these industrial and social relationships (Axelsson and Easton, 1992). Network relationships between firms often form as a means of resource exchange and lead to interdependencies, while maintaining individual firm autonomy. This section will describe the influence of these network relationships on a firm's decision to internationalise as well as on its subsequent international strategy, including its choices of foreign markets and entry modes.

The industrial network approach is a relatively young paradigm that largely emerged from Swedish studies (Easton, 1992). In one such eminent study, Johanson and Mattsson (1988) developed a network model illustrating industrial markets as networks of inter-firm relationships, with the intent of providing an explanation for the internationalisation of firms. The model allows consideration of important firm interdependencies and developmental processes in international markets. The authors describe the industrial system as being comprised of firms engaging in production, distribution and the use of goods and services. They view the system as a network of inter-firm relationships, whereby interdependency and co-ordination are paramount. The underlying assumption of their network model is that a firm is dependent on resources controlled by other firms. These resources can be tangible assets such as production facilities or intangible assets such as patented technology or access to distribution channels. Relationships between customers, suppliers, distributors and sometimes even competitors are cultivated and nurtured by a firm in order to gain access to these critical external resources and facilitate the sale of its products and services. With regard to this critical resource acquisition activity, the network approach can be linked to the principles of the resource-based perspective. These relationships can be bonded on a technical, social, cognitive, administrative, legal or economic basis (Johanson and Vahlne, 1990). Business transactions

between firms generally transpire within the framework of these established relationships (i.e. networks).

According to Johanson and Mattsson's (1988) network model, the internationalisation of a firm is characterised by the increasing quantity and quality of relationships with customers, suppliers, distributors and other key participants in foreign networks. Firm internationalisation is seen as the establishment and development of positions in relation to other firms in foreign networks, and is accomplished in three ways. The first is international extension, whereby relationships in foreign networks that are new to the firm are developed. The second is penetration, which is the process of enhancing positions and increasing resource commitments in the firms' existing foreign networks. The final way is international integration, which is achieved by expanding co-ordination between positions in various national networks. The authors posit that a firm's degree of internationalisation is indicative of the extent of its position establishment in various national networks, as well as the importance and integration of these positions.

Johanson and Mattsson's (1988) network model classifies four types of firms according to the degree of internationalisation of both the firm and the market, as illustrated in Table 3.1 below. The four types of firms or situations identified are 'the early starter', 'the late starter', 'the lonely international' and 'the international among others'. Madsen and Servais (1997) contend that the 'late starter' and 'international among others' classifications in Johanson and Mattsson's model are very similar to the situations of international start-ups, the focus of this thesis, and argue that the network approach to internationalisation is thus an insightful approach when analysing such firms.

Degree of Internationalisation Of the Firm	Degree of Internationalisation of the Market (The Production Net)		
		Low	High
	Low	The Early Starter	The Late Starter
High	The Lonely International	The International Among Others	

Table 3.1: Internationalisation and the Network Model

(Source: Johanson and Mattsson, 1988, p298)

Another dimension of the network approach to internationalisation involves inward-outward internationalisation linkages. While the discussion thus far has focused on networks leading to outward internationalisation, Welch and Luostarinen (1993) provide empirical evidence of inward internationalisation networks leading to outward internationalisation. In a study of licensing and franchising in Australia, the authors noted that inward internationalisation sourcing partners, i.e. suppliers of foreign inputs, provided a catalyst for reverse internationalisation through the partners' networks. For example, a foreign supplier of a product, service or technology may be instrumental in establishing a relationship between the supplied firm and the supplier's foreign distribution network, which may in turn lead to unsolicited orders and the exportation of the supplied firm's product or service. Not only can inward internationalisation open doors to the foreign supplier's networks, it also provides a firm with both enhanced foreign market knowledge and an international outlook, which can lead to outward internationalisation.

Support for the network approach to internationalisation is found in the empirical findings of Sharma and Johanson (1987), Johanson and Vahlne (1992), Blankenburg and Johanson (1992), Coviello and Munro (1995, 1997), and Chetty and Blankenburg Holm (2000), among others. Coviello and Munro's (1995, 1997) study of the influence of networks relationships on the internationalisation of small high technology firms is particularly insightful and will be described in detail since the

firms in the study closely match the characteristics of the firms in this thesis study. The methodology entailed in-depth case studies of the internationalisation processes of four small, entrepreneurial, New Zealand software firms. They found that the internationalisation processes of these firms were largely driven by the network relationships they developed and concluded that network relationships facilitate international growth. Furthermore, they noted that the firms' choice of which foreign markets to enter and which entry modes to employ were likewise influenced by their network relationships. This supports Johanson and Vahlne's (1992) contention that interaction in network relationships rather than strategic decision making plays a pivotal role in foreign market entry consideration. Interestingly, Coviello and Munro further concluded that network relationships can inhibit as well as foster product development and market diversification activities by placing constraints on both pursuing specific marketing opportunities and establishing outside relationships.

The network approach to internationalisation has received widespread acceptance as one of the explanatory models of small firm internationalisation. Small firms generally have limited resources and depend to a large extent on network relationships for international expansion. Coviello and Munro's (1995) findings support this contention by indicating that the firms in their study viewed network relationships as critical for obtaining foreign market knowledge, credibility, distribution channels, and as a means of reducing market entry costs, risks and time. Thus, the network approach plays an integral role in the explanation of small firm internationalisation.

Despite broad acceptance, the network approach to internationalisation has been criticised for its lack of predictive power. Furthermore, while Young, Bell, and Crick (1998) hold that network approaches provide helpful new insights and should be incorporated into small firm internationalisation frameworks, they contend that cause and effect relationships are ambiguous since networks could be viewed as a means of overcoming resource deficiencies rather than being drivers of internationalisation. This observation is particularly relevant to the firms in this

thesis, small international start-ups, since they typically possess scant resources and are dependent on foreign networks to overcome this deficiency in order to successfully engage in international business.

3.4 INTERNATIONALISATION PROCESS MODELS

The internationalisation process of a firm is generally associated with two major models: the Uppsala model and the innovation-related models. While both internationalisation process models will be illustrated in this section, the emphasis will be placed on the Uppsala model since it is the precursor and, as will be shown, the most applicable to the analysis of international start-ups, the focus of this thesis. Much of the academic research on the internationalisation process of a firm stems from the seminal work of Johanson and Wiedersheim-Paul (1975) and Johanson and Vahlne (1977, 1990). Their internationalisation process model is known as the Uppsala model, after the Swedish university where much of this model development emanated. While the constructs of the model originated from their study of the internationalisation process of just four Swedish firms, the authors contend that the process noted in the study is representative of most Swedish firms as well as many firms from other countries with small domestic markets.

Johanson and Wiedersheim-Paul's (1975) study of the internationalisation process of the four Swedish firms led to their identification of four distinct stages of entry modes for a foreign market, each with progressively larger resource commitments and international involvement. The authors noted that the firms in the study initially developed domestically and later internationalised through a series of small incremental decisions and steps. They posited that firms, lacking foreign market and operational knowledge as well as resources, engage in incremental decision making so as to reduce the perceived risk of foreign direct investment as a means of initial internationalisation. These incremental decisions are viewed as a series of stages of progressively larger international resource commitments as knowledge is enhanced and risk perception diminishes. The sequence of stages, referred to as the

‘establishment chain’ by the authors, is illustrated in Figure 3.2. The sequential stages are: 1) no regular export activities; 2) export via independent representatives (agents); 3) establishment of an overseas sales subsidiary; and 4) foreign production/manufacturing. Numerous empirical challenges to the Uppsala stage postulate exist and will be delineated later in this section.

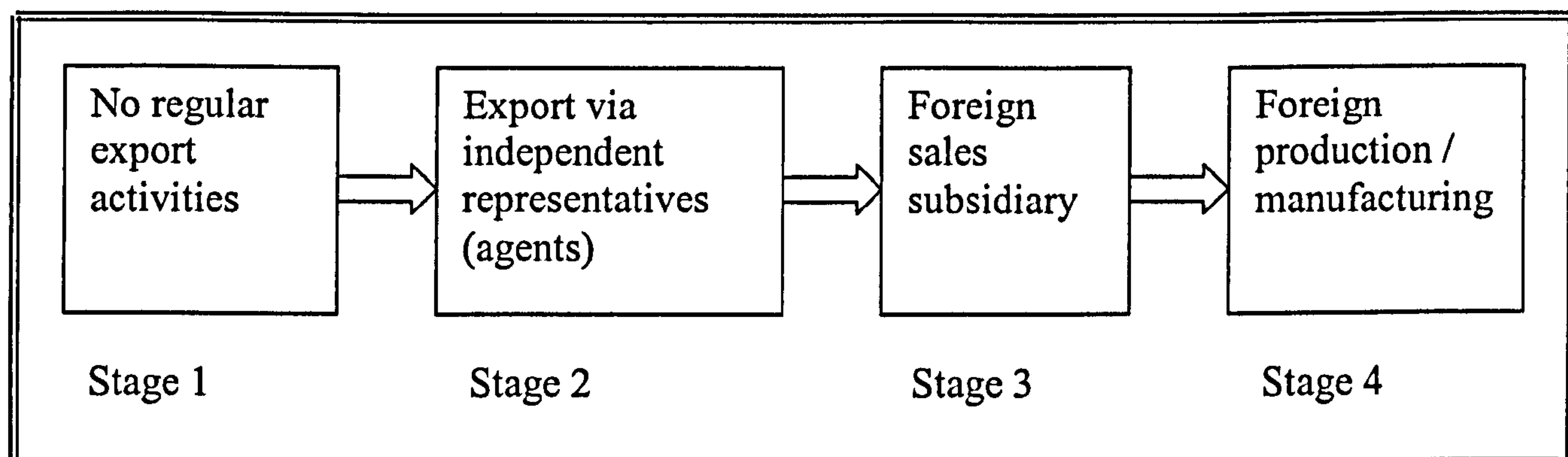


Figure 3.2: Uppsala Internationalisation Establishment Chain or Stages

(Source: Johanson and Wiedersheim-Paul, 1975, p307)

While the stages identified in the study demonstrated a pattern of international involvement within a particular country, Johanson and Wiedersheim-Paul (1975) sought an understanding of the internationalisation across country markets. The firms in their study exhibited a propensity to enter new country markets with progressively greater ‘psychic distance’. The authors defined psychic distance as factors that inhibit information flows between a firm and a foreign market, for example differences in language, culture, business practices, education, industrial development and political systems. Although exceptions commonly occur, psychic distance is often correlated with geographical distance in the foreign market selection process (Johanson and Wiedersheim-Paul, 1975). In terms of internationalisation, the authors posited that firms initially enter markets with minimal levels of psychic distance and gradually enter markets with successively greater levels.

The psychic distance postulate has been challenged by numerous academics and been subjected to extensive empirical testing. Although empirical evidence supporting the postulate has been noted, Bell and Young (1998) contend that factors influencing

foreign market selection have changed since the mid-1970s when the Uppsala authors first proposed the psychic distance principle. Bell and Young posit that the relevance of psychic distance in the internationalisation process has diminished and that other factors such as those related to industry, level of foreign market demand and relationships with existing and prospective clients exert more influence on initial and ensuing foreign market selection and entry mode decisions.

Johanson and Vahlne (1977, 1990) expanded on Johanson and Wiedersheim-Paul's (1975) earlier work and focused on a theoretical explanation for the incremental internationalisation behaviour. Johanson and Vahlne (1977) developed a dynamic internationalisation model, where the outcome of one decision frames the input of another. As depicted in Figure 3.3, the model is divided into state and change aspects. The state aspects are market commitment, which is the resources committed to foreign markets, and market knowledge, which represents the extent of foreign market knowledge at a particular point of time. The change aspects are commitment decisions, which are decisions related to the commitment of resources to international operations, and current activities, which represent current business activities. The dynamism of the model rests in the state of a firm's market knowledge and commitment affecting commitment decisions and the manner in which business activities are performed, which in turn change the firm's market knowledge and commitment, thereby creating a cycle. Taken holistically, the model illustrates a firm's incrementally increasing commitment to an individual foreign country as market knowledge increases through successively gaining experiential knowledge by conducting operations in the country.

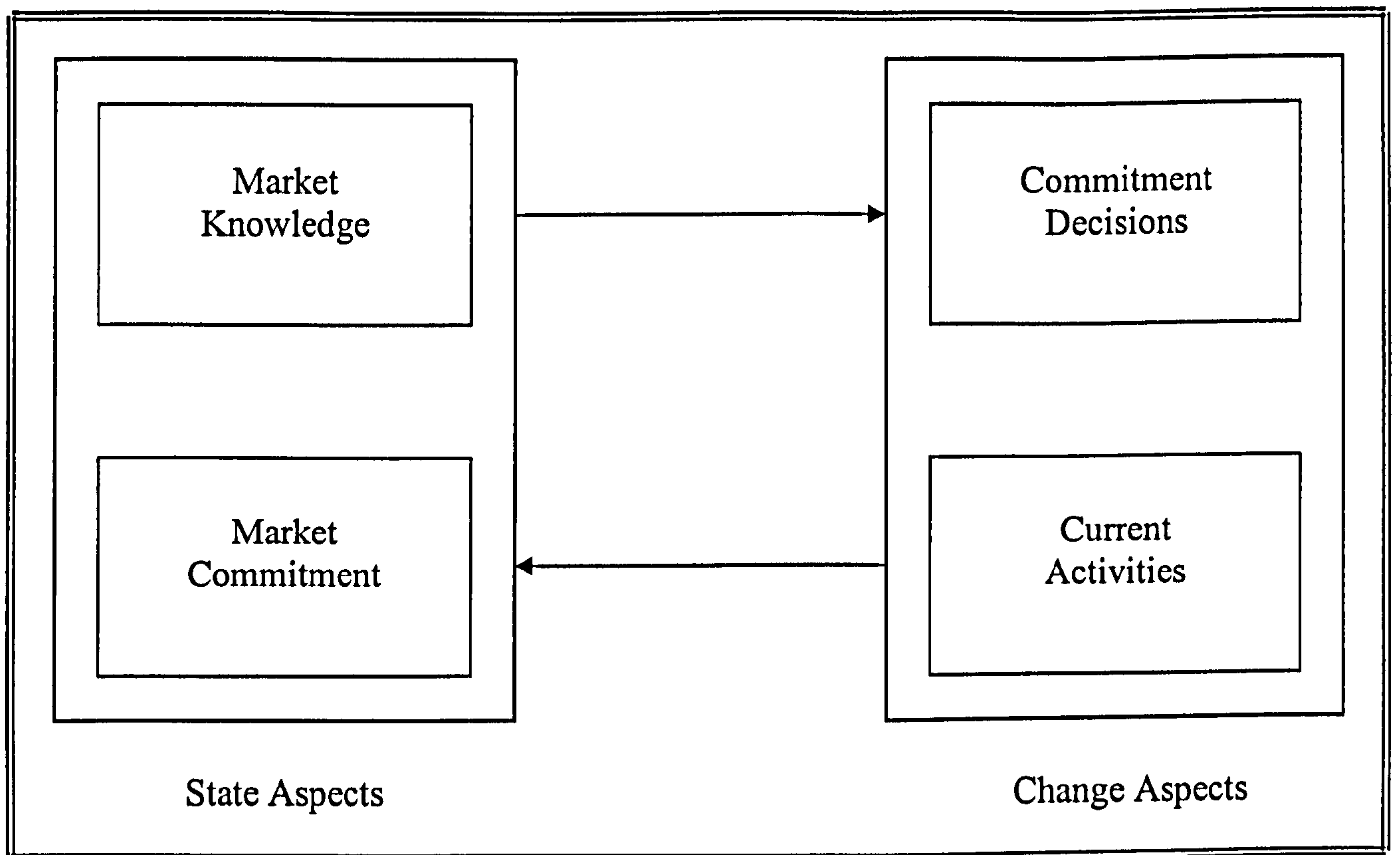


Figure 3.3: Uppsala Internationalisation Process Model

(Source: Johanson and Vahlne, 1977, p26)

The second major internationalisation process model is the innovation-related model, which is commonly associated with the work of Bilkey and Tesar (1977), Cavusgil (1980), Reid (1981) and Czinkota (1982). The model, which is primarily comprised of a set of models from these authors, is illustrated in Table 3.2. The models depict a progressive learning process leading to internationalisation from an innovation adoption perspective, whereby internationalisation is viewed to result from a sequence of internal management innovations. The four models exhibit distinct similarities, principally differing in terms of the number of stages and the semantic description of each stage. They portray a firm's sequential internationalisation process from domestic orientation to gradual export involvement.

Bilkey and Tesar (1977)	Cavusgil (1980)	Czinkota (1982)	Reid (1981)
<p><u>Stage 1</u> Management is not interested in exporting</p> <p><u>Stage 2</u> Management is willing to fill unsolicited orders, but makes no effort to explore the feasibility of active exporting</p> <p><u>Stage 3</u> Management actively explores the feasibility of active exporting</p> <p><u>Stage 4</u> The firm exports on an experimental basis to some psychologically close country</p> <p><u>Stage 5</u> The firm is an experienced exporter</p> <p><u>Stage 6</u> Management explores the feasibility of exporting to other more psychologically distant countries</p>	<p><u>Stage 1</u> Domestic marketing: The firm sells only to the home market</p> <p><u>Stage 2</u> Pre-export stage: The firm searches for information and evaluates the feasibility of undertaking exporting</p> <p><u>Stage 3</u> Experimental involvement: The firm starts exporting on a limited basis to some psychologically close country</p> <p><u>Stage 4</u> Active involvement: Exporting to more new countries-direct exporting-increase in sales volume</p> <p><u>Stage 5</u> Committed involvement: Management constantly makes choices in allocating limited resources between domestic and foreign markets</p>	<p><u>Stage 1</u> The completely uninterested firm</p> <p><u>Stage 2</u> The partially interested firm</p> <p><u>Stage 3</u> The exporting firm</p> <p><u>Stage 4</u> The experimental firm</p> <p><u>Stage 5</u> The experienced small exporter</p> <p><u>Stage 6</u> The experienced large exporter</p>	<p><u>Stage 1</u> Export awareness: Problem of opportunity recognition, arousal of need</p> <p><u>Stage 2</u> Export intention: Motivation, attitude, beliefs, and expectancy about export</p> <p><u>Stage 3</u> Export trial: Personal experience from limited exporting</p> <p><u>Stage 4</u> Export evaluation: Results from engaging in exporting</p> <p><u>Stage 5</u> Export acceptance: Adoption of exporting/rejection of exporting</p>

Table 3.2: Review of Innovation-Related Internationalisation Models

(Source: Andersen, 1993, p213)

The Uppsala and innovation-related internationalisation models possess numerous similarities. Both are behaviourally oriented and describe an incremental firm internationalisation process based on the gradual accumulation of experiential knowledge, thereby reducing its intrinsic uncertainty (Anderson, 1993). The complementarities can be attributed to the authors of the innovation-related models building on Johanson and Vahlne's (1977) model and associated themes. One of the key differences lies in the extent of foreign market entry mode illustration. Whereas the innovation-related models largely focus on exporting, the Uppsala model encompasses foreign value chain activity, i.e. the establishment of overseas sales subsidiaries and foreign production, in its stage sequence as a succession to exporting. While both the Uppsala and innovation-related models add significantly to the understanding of a small firm's internationalisation process, the remainder of this section focuses on the Uppsala model since its inclusion and illustration of multiple entry modes is more representative of the nature of small international start-ups.

While support for the Uppsala internationalisation process model exists, it has been widely criticised at both the theoretical and operational levels over its incremental international commitment postulate (Welch and Luostarinen, 1988; Luostarinen, 1994; Petersen and Pedersen, 1997, Hadjikhani, 1997). Before reviewing various critiques it should be noted that the Uppsala authors themselves state that the model has limited predictive value and is primarily applicable to SMEs and firms with limited resources (Johanson and Vahlne, 1977, 1990). The authors state that the model is built on the assumptions that firms seek to increase long-term profitability and minimise risk, and that these two factors collectively influence decision making (Johanson and Vahlne, 1977). Petersen and Pedersen (1997) add a boundary assumption to the model in an effort to buffer undue criticism, stating that the model is principally applicable to operations motivated in market seeking as opposed to other motives such as resource or technology seeking.

A myriad of empirical studies has been conducted on the operational dimension of the Uppsala model, with many finding no support for the model's incremental internationalisation principles. For example, Turnbull's (1987) study of the

internationalisation process of 24 UK companies operating in France, Germany and Sweden in the large marine diesel, motor vehicle component and telecommunications equipment industries found no support for the evolutionary path postulated in the internationalisation process model. His findings indicated that a firm's internationalisation sequence was largely determined by its operating environment, industry structure and marketing strategy. Sullivan and Bauerschmidt's (1990) test of the Uppsala model also failed to provide support. Their quantitative study of 62 managers in the forest product industries of Austria, Finland, Sweden and West Germany did not support the incremental process hypothesis. Finally, Petersen and Pedersen (1997) noted a high level of 'leap-frogging' of stages in their study of the internationalisation process of 162 Danish firms. Petersen and Pedersen (1997) concluded that after twenty years of extensive empirical testing by a multitude of researchers, the Uppsala model remains unchallenged and rather robust at the theoretical level, although they contend that there is little justification for market knowledge accumulation being the sole explanatory factor for incremental internationalisation.

Bell (1995) conducted a qualitative and quantitative study of the export behaviour of small computer software firms in Finland, Ireland and Norway. His findings indicated that the internationalisation process model did not accurately reflect the factors influencing the internationalisation of the firms in the study. Evidence showed that the internationalisation process was influenced by the following of domestic and foreign clients, the targeting of niche markets and industry-specific conditions, rather than psychic or geographic closeness. Furthermore, the study provided minimal support for a stage sequence of internationalisation beginning with exporting and progressing to other market entry modes. The author asserts that exporting may not always be the preferred or most optimal foreign market entry mode. Finally, Bell noted evidence of rapid internationalisation among software firms and not the small incremental steps associated with the internationalisation process model.

Lindqvist (1997) likewise found evidence of rapid internationalisation in her qualitative and quantitative study of the internationalisation process of small technology-based Swedish firms. While noting some support for the Uppsala internationalisation process model, an array of differences with the model in terms of the pattern of foreign market selection and choice of entry mode were recorded in addition to the rapidity of internationalisation. She found that country market selection was much greater influenced by large market potential and access to advanced customers motives than by psychic distance factors. The author posited that the swift internationalisation exhibited by the firms in her study may be indicative of their technology-based nature since these firms frequently operate in small market niches.

Like Bell and Lindqvist, Coviello and Munro (1997) chronicled further empirical evidence of rapid internationalisation and general deviation from the tenets of the internationalisation process model. Their study of four New Zealand-based software development firms recorded very rapid internationalisation processes, with firms becoming committed internationalists within the first few years of operation. They found limited support for the notion of psychic distance and observed distinct patterns of stage deviation and the simultaneous use of multiple entry modes.

Despite copious quantities of empirical challenges at the operational level, the internationalisation process model remains a dynamic, albeit general, conceptualisation providing valuable insight into small firm internationalisation (Young, 1990). Small firms that lack international experience, knowledge and resources often internationalise gradually as they acquire experiential knowledge in order to minimise risk and operate within resource constraints. However, as empirical evidence suggests, small firms frequently deviate from the stage sequence postulated by the Uppsala authors. As will be detailed in Chapter 4, small international start-ups are among the firms that substantially deviate from the constructs of the model.

3.5 CONCLUSIONS

This chapter delineated numerous theoretical approaches to the internationalisation of the firm. Brief summaries of the six principal internationalisation frameworks presented in the chapter, along with their contributions and criticisms, are illustrated in Table 3.3. Whereas some of the approaches hold high explanatory value for the internationalisation of small firms, others have lesser applicability and render limited insight. This conclusion section will highlight the relevant applications of the theoretical approaches that facilitate an understanding of small firm internationalisation. The intent is to provide a foundation enabling the ensuing analysis of the relationships of these six theoretical approaches to small international start-ups, which is outlined in Section 4.2.

Internationalisation Framework	Summary, Contributions and Criticism
<p><i>Rational Approaches:</i> Transaction Cost Approach</p>	<p><i>Summary:</i></p> <ul style="list-style-type: none"> • Transaction cost minimisation/efficiency principles • Lowest transaction cost governance structure chosen • Firms internalise when transaction costs in external market structures exceed the costs of internal structures • Inter-firm co-operative arrangements form when it represents the most efficient organisational mechanism <p><i>Contributions:</i></p> <ul style="list-style-type: none"> • Transaction cost economising principles enhance the understanding of firm integration decisions in both domestic and international contexts • Provides an explanation for vertical integration <p><i>Criticism:</i></p> <ul style="list-style-type: none"> • Lacks direct internationalisation dimension • Lacks generality and analytic ability • Little practical relevance/applicability
<p>Internalisation Theory</p>	<p><i>Summary:</i></p> <ul style="list-style-type: none"> • Internalisation through common ownership and control occurs when transaction costs associated with internal production are lower than with external market production • Firms choose least cost location for each activity performed • Firms grow by internalising up to benefit/cost threshold <p><i>Contributions:</i></p> <ul style="list-style-type: none"> • Provides international application of the transaction cost approach • Provides explanation for MNE existence and growth as well as for vertical/horizontal integration

	<p><i>Criticism:</i></p> <ul style="list-style-type: none"> • Limited explanatory ability for small firms, due to the emphasis placed on FDI • Testing the theory is problematic without instituting restrictive assumptions
<p>The Eclectic Paradigm</p>	<p><i>Summary:</i></p> <ul style="list-style-type: none"> • Holistic framework for explaining and analysing the determinants of international production • Extent, form and pattern of foreign production determined by a firm's perception of associated ownership, location and internalisation advantages • Foreign production decisions conditional on the perceived securing of all three sets of advantages <p><i>Contributions:</i></p> <ul style="list-style-type: none"> • Provides a multi-dimensional organising framework of international business principles, which facilitates the understanding of international production decisions <p><i>Criticism:</i></p> <ul style="list-style-type: none"> • Static, lacks dynamism • Assumes that decision makers have access to perfect information • Overlapping/redundant explanations • Limited explanatory value for small firm international production decisions due to resource constraints restricting FDI
<p>Resource-Based Perspective</p>	<p><i>Summary:</i></p> <ul style="list-style-type: none"> • Focuses on a firm's ability to acquire and maintain resources, which provide capabilities that can lead to competitive advantage and facilitate its survival and growth • Small firms are commonly resource deficient and look outside the firm for obtaining critical resources, often

	<p>engaging in strategic alliances and network relationships</p> <ul style="list-style-type: none"> • Initial country market and entry mode decisions based on exploitation of competences within resource constraints <p><i>Contributions:</i></p> <ul style="list-style-type: none"> • Useful for analysing the alternative directions of expansion, both domestic and international, that firms may pursue • Facilitates an understanding of small firm internationalisation in terms of resource acquisition, conservation and utilisation <p><i>Criticism:</i></p> <ul style="list-style-type: none"> • Relatively little work done on resource-based applications to small firm internationalisation and development • Does not describe how small firms can gain resources
<p><i>Behavioural Approaches:</i></p> <p>Network Approaches</p>	<p><i>Summary:</i></p> <ul style="list-style-type: none"> • Networks of inter-firm relationships provide access to critical external resources and facilitate the sale of products/services • Internationalisation and the selection of foreign markets and entry modes are influenced by foreign network relationships • Inward internationalisation (foreign inputs) networks can lead to outward internationalisation <p><i>Contributions:</i></p> <ul style="list-style-type: none"> • Provides an explanation for small firm internationalisation, including the selection of foreign markets and entry modes <p><i>Criticism:</i></p> <ul style="list-style-type: none"> • Lacks predictive power • Cause and effect ambiguity over viewing networks as facilitators for overcoming resource deficiencies or as drivers of internationalisation

<p>Internationalisation Process Models</p>	<p><i>Summary:</i></p> <ul style="list-style-type: none"> • Firms internationalise through a series of small incremental steps following domestic business development • Firms make progressively larger foreign market resource commitments as experiential knowledge increases and risk perception diminishes • Firms gradually enter new foreign markets with successively greater levels of psychic distance <p><i>Contributions:</i></p> <ul style="list-style-type: none"> • Provides valuable insight into the internationalisation process of small firms with limited resources and limited international knowledge <p><i>Criticism:</i></p> <ul style="list-style-type: none"> • Limited predictive value • Extensive empirical evidence of widespread deviation from the model's incremental internationalisation principle • Existence of other explanatory factors for a firm's staged internationalisation process
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Table 3.3: Summary, Contributions and Criticism of Internationalisation Frameworks

(Source: the author, derived from the literature)

As indicated in Section 3.2, the three illustrated economic approaches to internationalisation are more applicable to MNE activity than small firms. Small firms typically lack the requisite resources for extensive internationalisation and FDI. They often rely on network relationships and alliances to compensate for their resource deficiencies, enabling their engagement in international business. Since internationalisation and FDI are thus restricted options, internationalisation theory and the eclectic paradigm provide limited explanatory value for the existence and growth of internationalised small firms. Even though FDI might reduce the transaction costs of a small firm and offer OLI advantages, it is frequently not a viable economic alternative, implying that transaction cost minimisation and perceived OLI

advantages are therefore not drivers of small firm internalisation and internationalisation. However, the transaction cost approach's general tenet of transaction cost minimisation and efficiency is loosely applicable and provides an explanation for small firm reliance on inter-firm co-operative arrangements, as this may represent the most efficient governance mechanism.

While the economic approaches to internationalisation render limited explanatory value, the remaining three approaches illustrated significantly enhance the understanding of small firm internationalisation. The resource-based perspective applied to internationalisation provides high explanatory value for small firm internationalisation by focusing on a firm's ability to acquire and maintain resources as a means of establishing competitive advantage and successfully engaging in international business. The perspective recognises that the resource deficiencies inherent in most small firms generally preclude their successful international competition without obtaining outside resources. This leads to the establishment of network arrangements and strategic alliances to secure these key resources, facilitating their internationalisation and ability to compete in international markets. Thus, the resource-based perspective makes a noteworthy contribution to the understanding of small firm internationalisation.

The network approach likewise provides considerable insight into the internationalisation of small firms. In congruence with the resource-based perspective, the approach recognises the crucial role of inter-firm network relationships in providing critical external resources necessary for small firms to sell their products and services in foreign markets. The approach also notes the influence of these network relationships on the small firm's internationalisation strategy, specifically relating to foreign market selection and choice of entry modes. Furthermore, the approach acknowledges the influence of inward internationalisation network partners on the subsequent outward internationalisation of small firms. Collectively, the network approach significantly contributes to the understanding of the internationalisation of small firms.

Finally, internationalisation process models offer insight into the internationalisation process of small firms. The models are based on a firm's gradual commitment to international business and operations as experiential knowledge accumulates. Small firms often lack international knowledge and experience and consequently internationalise in small incremental steps as their international knowledge and experience increases and their risk perception diminishes. Despite extensive empirical evidence of firm deviation from this staged internationalisation process, the models add value to the understanding of small firm internationalisation at the theoretical level. While small firms do not always begin domestically, slowly become involved in exporting and later employ foreign value chain activity, the models nevertheless recognise the significance of experiential knowledge acquisition in foreign commitment decision making and ultimately the internationalisation process of small firms. Furthermore, empirical testing of the models at the operational level has led to the identification of firms that deviate from the models by exhibiting early and rapid internationalisation, thereby leading to the identification of small international start-ups.

INTRODUCTION

Section 3.4 identified several studies whose findings challenged traditional internationalisation process models. The studies represent some of the recent research that has noted the advent of small firms with limited resources that have engaged in international activity at or near their time of inception, thereby deviating from established internationalisation process models. The studies' findings suggest that these international start-ups are an emerging phenomenon world-wide. This chapter focuses on the theoretical development and empirical evidence of these international start-ups.

The objectives of this chapter are twofold. First, a theoretical foundation facilitating an explanation and understanding of international start-ups will be provided. Second, empirical findings regarding international start-ups will be reviewed so as to provide a comprehensive overview and profile of this unique business enterprise. The chapter commences with a detailed description of Oviatt and McDougall's (1994) international new venture paradigm, which has important implications for the classification and understanding of international start-ups. An analysis of the relationships of the theoretical approaches to internationalisation described in the previous chapter to international start-ups follows. The succeeding section outlines empirical evidence of the existence and emergence of international start-ups. Next, the factors influencing their formation are examined. This is followed by the delineation of their distinguishing characteristics. Several empirical studies are then reviewed, rendering findings regarding international start-up strategy, risk and performance. The chapter closes with the development of an organising framework for small high technology international start-ups, the focus of this thesis study.

4.1 INTERNATIONAL NEW VENTURE PARADIGM

The international new venture paradigm is widely attributed to the work of Oviatt and McDougall (1994). In congruence with the rapid internationalisation patterns noted in the empirical studies described in the previous chapter, the international new venture paradigm focuses on firm age in the internationalisation process. Specifically, the paradigm centres on firms that are international at or near inception. Since the term international new venture is synonymous with international start-up, although as will be shown Oviatt and McDougall's definitional criteria for an international new venture varies slightly from this thesis' definitional criteria for an international start-up, the paradigm provides invaluable insight into the explanation and understanding of this class of new venture firms.

Oviatt and McDougall (1994, p49) define an international new venture as “a business organisation that, from inception, seeks to derive significant competitive advantage from the use of resources and the sale of outputs in multiple countries”. Whereas internationalisation process models describe the gradual evolution of a firm from a domestic company to a multinational enterprise, the international new venture paradigm offers an explanation for firms that commence with an international strategy. The authors contend that international new ventures are largely driven to be ‘born global’ by competitive forces which preclude a successful domestic orientation. Case study analysis of 24 international new ventures by McDougall, Shane and Oviatt (1994) suggested that this business entity is emerging throughout the world and is present in a variety of industries, with high-technology industries being the most prevalent.

The roots of the international new venture paradigm can be traced to several theoretical frameworks of internationalisation, crossing multiple disciplines. Entrepreneurship perspectives, network approaches and the resource-based perspective applied to internationalisation provide a partial explanation for international new ventures (Oviatt and McDougall, 1994; McDougall et al., 1994; Shrader, Oviatt and McDougall, 1996; Madsen and Servais, 1997). The authors

contend that these theoretical frameworks coupled with the principles of strategic management facilitate an understanding of international new ventures. The relationships of these internationalisation frameworks to international start-ups will be analysed in Section 4.2.

Oviatt and McDougall (1994) provided a theoretical framework for international new ventures based on required elements for their sustainment (see Figure 4.1). The first necessary element leading to a sustainable international new venture is the internalisation of some transactions, although foreign direct investment is not a defining characteristic. The second element is the extensive utilisation of alternative governance structures to access resources. Since international new ventures typically lack the required resources to internalise or own many assets, in contrast to mature organisations, they must rely on alternative modes of controlling their various critical assets, such as through the formation of strategic alliances and the utilisation of networks. The third element is the establishment of foreign location advantages, which are advantages over indigenous firms in foreign locales. The final element is the possession of and control over unique resources, which is often unique proprietary knowledge. While Oviatt and McDougall's international new venture framework provides insight into the elements leading to their sustainment, it offers little more than the OLI advantage tenets of Dunning's (1977, 1981, 1988) eclectic paradigm.

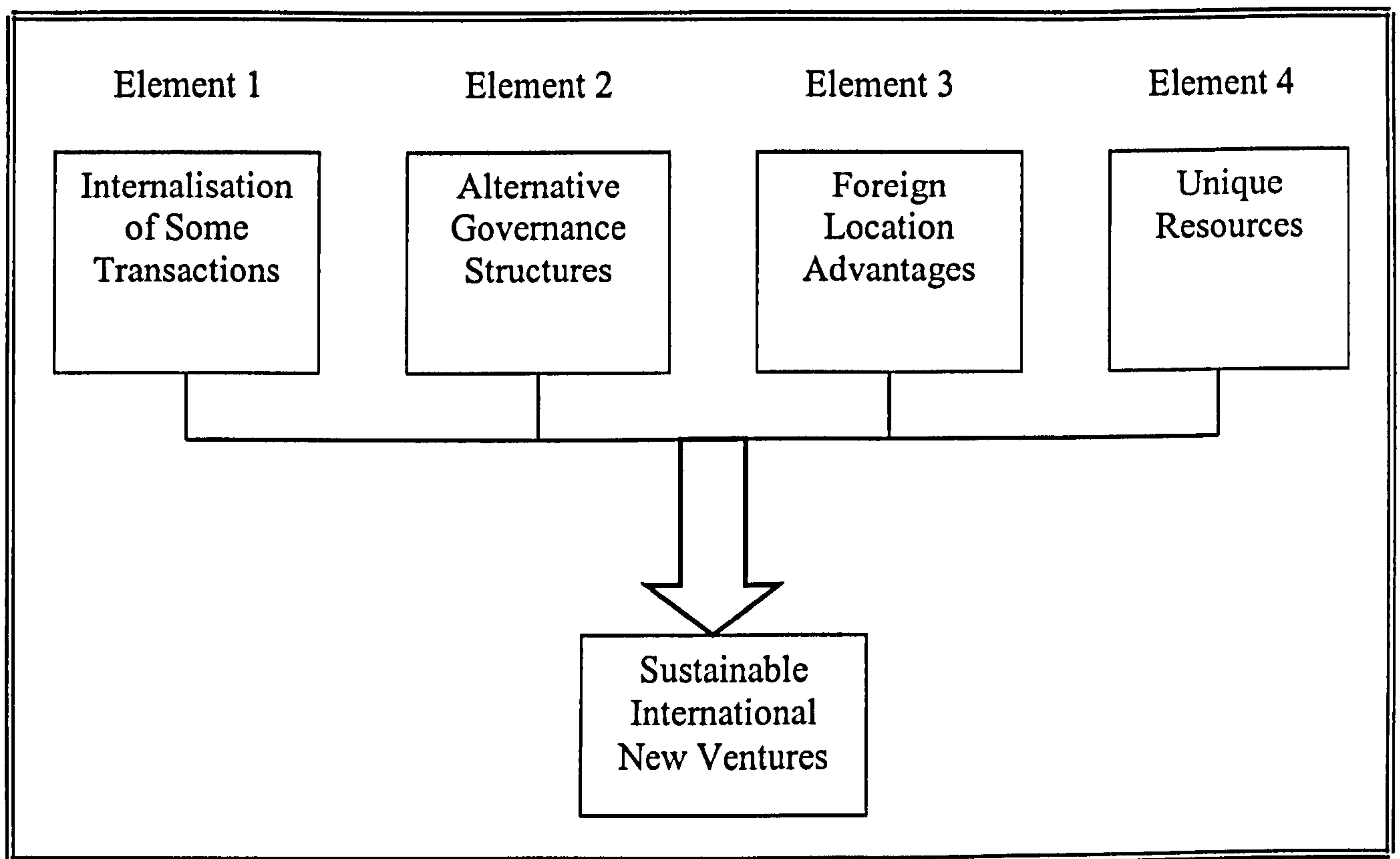


Figure 4.1: International New Venture Framework

(Source: Oviatt and McDougall, 1994, p54)

Oviatt and McDougall (1994) identified four types of international new ventures: export/import start-ups, multinational traders, geographically focused start-ups and global start-ups (see Table 4.1). The authors classify the first two types as new international market makers, characterised by few value chain activities co-ordinated across countries. These value chain or organisational activities include the primary activities of inbound logistics, operations, outbound logistics, marketing and sales and service, as well as support activities such as procurement, technology development, human resource management and capital acquisition (Porter, 1985, 1986). The distinction between the first two types of international new ventures is that export/import start-ups are involved in relatively few countries, while multinational traders are involved in many countries. Geographically focused start-ups co-ordinate many value chain activities across the few countries they are involved in, often specialising in a particular region of the world.

The final type of international new venture identified by Oviatt and McDougall is global start-ups. Global start-ups represent the most extreme form of international new ventures, gaining competitive advantage through extensive co-ordination of many value chain activities across numerous geographically dispersed countries. Global start-ups proactively capitalise on global opportunities to acquire assets and sell outputs in any location of the world offering the highest potential return. They can be deemed as being geocentric in nature, as they manifest a world orientation mind-set (Perlmutter, 1969).

<p>Few Activities Co-ordinated Across Countries (Primarily Logistics)</p> <p>Co-ordination of Value Chain Activities</p>	<p>Export / Import Start-up</p>	<p>Multinational Trader</p>
	<p>Geographically Focused Start-up</p>	<p>Global Start-up</p>
<p>Many Activities Co-ordinated Across Countries</p>	<p>Few</p>	<p>Many</p>
<p>Number of Countries Involved</p>		

Table 4.1: Types of International New Ventures

(Source: Oviatt and McDougall, 1994, p59)

Although evidence of the emergence of international new ventures exists (Knight and Cavusgil, 1996), few empirical studies have been conducted. Furthermore, the small number of studies that have been conducted are primarily case study based and lack large sample and quantitative analysis. Academic knowledge of the factors influencing their formation, their characteristics, the impact of cultural differences and their success factors is severely limited. This thesis will explore these issues and

address these gaps in the literature by providing qualitative and quantitative evidence of international start-ups.

4.2 INTERNATIONALISATION THEORIES/Frameworks RELATIONSHIPS TO INTERNATIONAL START-UPS

The previous section defined international new ventures, and hence international start-ups, as a type of new venture that from inception seeks to derive competitive advantage by conducting business and utilising its resources in multiple countries (Oviatt and McDougall, 1994). Providing a definitional and organisational foundation, Oviatt and McDougall's international new venture paradigm plays a pivotal role in the explanation and understanding of international start-ups. As furtherance to this explanatory theme, this section examines the relationships of the internationalisation theoretical approaches and frameworks highlighted in Chapter 3 to international start-ups in order to facilitate an understanding of this unique business enterprise.

The transaction cost approach applies the principles of transaction cost minimisation and efficiency to governance structure decisions. As will be detailed in Section 4.5, international start-ups are generally small and possess limited resources due to their newness and international scope. As a result, international start-ups typically lack the resources required for extensive internalisation and often rely on alternative governance structures, such as strategic alliances and networks, for many of their value chain activities. This requisite strategy thus has roots in the transaction cost approach since resource conservation and efficiency play an integral role in governance structure decisions. However, as stated in Chapter 3, the transaction cost approach has been criticised for its lack of generality and practical relevance, particularly with innovating firms and their R&D linkages, due to the approach's emphasis on asset specificity and absence of the recognition of economies of scope generated by technology/knowledge gained through R&D efforts (Kay, 1991; Casson, 1992; Ghoshal and Moran, 1996). Since international start-ups are often

innovation oriented (see Section 4.5), the relationship of the transaction cost approach to international start-ups is limited to its underlying principles of transaction cost minimisation and efficiency as applied to choice of governance structures.

Internalisation theory holds that MNEs exist as a result of firms internalising foreign production activities in order to minimise transaction costs. The theory is based on the principle that firms choose the least cost locations for each of their activities and that they grow by internalising markets up to the point where they reach the benefit/cost threshold (Buckley, 1988). While the theory is widely acclaimed for its explanatory capabilities for multinational enterprise, it provides little explanation for the existence of international start-ups. Since international start-ups typically possess scant resources, internalisation of value chain activities is severely limited in terms of FDI. Rather, they depend on alternative governance structures such as strategic alliances and network relationships to control key activities, thereby conserving critical resources. Therefore, internalisation theory provides little explanatory value for the existence of international start-ups. Furthermore, a study conducted by McDougall, Shane and Oviatt (1994) found that international start-ups are not generally driven by the principles of least cost location for their activities or cost reduction as the basis for internalisation decisions. The authors further contend that the firm-level focus of the theory on large, mature company internalisation rather than on entrepreneurs and their network alliances precludes an understanding of the internationalisation of international start-ups. Thus, internalisation theory does not provide a comprehensive explanation for the existence of international start-ups.

The eclectic paradigm provides a holistic framework for the explanation and analysis of the determinants of international production. The paradigm holds that the extent, form and pattern of foreign production are determined by a firm's perception of the ownership, location and internalisation (OLI) advantages to be derived from the activity. While the paradigm is widely acclaimed for its explanatory and analytic abilities regarding MNE international production, it offers little explanatory value and application for international start-ups since the perception of OLI advantages

does not appear to be highly influential in their establishment of foreign production. As indicated in the preceding paragraph on internalisation theory, empirical evidence, albeit limited, suggests that international start-ups are not generally driven by the principles of least cost location or transaction cost reduction as a basis for internalisation decisions. Furthermore, international start-ups, being new and often small, typically lack the requisite resources for the substantial FDI associated with internalising foreign production. Due to these resource constraints, international start-ups commonly engage in strategic alliances and network relationships when foreign production is deemed to be advantageous. However, in the limited number of cases where international start-ups do internalise foreign production, the expectation of ownership, location and internalisation advantages likely play a role in the decision making process. Thus, while the eclectic paradigm has limited relevance to international start-ups, it largely lacks explanatory value for their international production activity.

The resource-based perspective applied to internationalisation focuses on a firm's ability to acquire and maintain resources, which provide capabilities that can lead to competitive advantage and facilitate its survival and growth (Wernerfelt, 1984; Grant, 1991). Initial country market and entry mode decisions are based in part on the intended exploitation of its competences, within resource constraints. The resource-based perspective provides valuable insight into the internationalisation of small firms, with particular relevance to small international start-ups due to their inherent resource deficiencies, which are exacerbated by their newness and the extent of their internationalisation. Specifically, the resource-based perspective provides an understanding of the extensive reliance of small international start-ups on alternative governance structures and business/social networks (to be detailed in Section 4.5) in order to effectively target and enter foreign markets. Empirical evidence suggests that the founders of international start-ups leverage their experience and network competences by combining international resources in an effort to exploit international opportunities (McDougall, Shane and Oviatt, 1994). While not rendering an all-encompassing explanation of international start-ups, the resource-based perspective provides a partial understanding of their critical resource

accumulation, conservation and utilisation processes that enable their early internationalisation despite severe resource constraints.

Network approaches to internationalisation highlight the influence of inter-firm network relationships, which form to provide access to critical external resources, on a firm's decision to internationalise and on its subsequent strategic decisions related to country market selection and entry modes. The network approach to internationalisation has particular relevance and applicability to international start-ups since their idiosyncratic newness and frequent small size generally equate to resource scarcity, which leads to their common reliance on business and social network relationships to compensate for these resource deficiencies. An international start-up's foreign network partners, such as its suppliers and distributors, exert influence on the extent of its internationalisation, foreign markets targeted and choice of entry modes. The substantive contribution of this approach in providing an explanation and understanding of international start-ups is expounded in the work of McDougall, Shane and Oviatt (1994) and Madsen and Servais (1997). While the network approach does not provide a complete explanation for the existence of international start-ups, it nevertheless renders a partial explanation for their internationalisation behaviour.

Internationalisation process models provide an explanation for a small firm's gradual internationalisation, based on a staged sequence of progressively larger foreign market resource commitments as experiential knowledge increases and risk perception diminishes. The models recognise the impact of the inherent resource constraints of young, small firms on entry mode decisions and the selection of new country markets based on a firm's perception of psychic distance. While the models conceptually provide explanatory value for small firms, they have little application and relevance to international start-ups. Empirical evidence indicates that internationalisation process models fail to provide an explanation for international start-ups (McDougall, Shane and Oviatt, 1994; Shrader, Oviatt and McDougall, 1996; Oviatt and McDougall, 1997; Madsen and Servais, 1997). The studies noted numerous divergences from the constructs of the models and stage sequence tenets in

that international start-ups were found to not have domestic origins or slow internationalisation patterns, but rather possess an international vision from inception and exhibit very rapid internationalisation. Additionally, international start-ups were observed to often leapfrog over stages and/or concurrently engage in more than one stage activity. Furthermore, the studies found that international start-ups do not internationalise based on gradual learning or risk aversion, but instead capitalise on the founders' past experiences and aggressively pursue international opportunities from the outset. Thus, while internationalisation process models facilitate a general understanding of traditional small firm internationalisation, they fail to provide an explanation for the existence and internationalisation behaviour of international start-ups.

This section highlighted the principal tenets of several internationalisation theoretical approaches and frameworks and their relationships to international start-ups in an effort to facilitate an explanation for and an understanding of their existence and internationalisation behaviour. Table 4.2 provides an overview of the relationships of these frameworks to international start-ups. Analysis of the frameworks leads to the conclusion that the resource-based perspective and network approaches to internationalisation provide a partial explanation for international start-ups. These two frameworks coupled with the constructs of both the international new venture paradigm and entrepreneurship/international entrepreneurship principles (discussed in Chapter 2) render a general, albeit limited, understanding of the existence and nature of international start-ups.

Internationalisation Framework	Relationships to International Start-ups
<p><i>Rational Approaches:</i></p> <p>Transaction Cost Approach</p>	<ul style="list-style-type: none"> • Limited relationship, but the principles of transaction cost minimisation and resource efficiency are loosely applicable • Governance structure decisions based on resource conservation and efficiency • Inter-firm co-operative arrangements form to conserve critical resources
<p>Internalisation Theory</p>	<ul style="list-style-type: none"> • Minimal relationship since international start-ups are not driven to internalise, and in the process become multinational, based on transaction cost reduction motives
<p>The Eclectic Paradigm</p>	<ul style="list-style-type: none"> • Little explanatory value for international start-ups since their international production activity is not generally based on perceived ownership, internalisation and location advantages
<p>Resource-Based Perspective</p>	<ul style="list-style-type: none"> • Provides a partial explanation for international start-up critical resource accumulation processes, which facilitate their early internationalisation, despite severe resource constraints • Renders an understanding of their extensive reliance on alternative governance structures and network relationships to access and conserve critical resources • External network and alliance relationships in order to build and leverage competences in addition to compensating for resource deficiencies
<p><i>Behavioural Approaches:</i></p> <p>Network Approaches</p>	<ul style="list-style-type: none"> • Provides a partial explanation for the internationalisation behaviour of international start-ups • Reliance on business and social networks to obtain access to

	<p>critical external resources and facilitate the sale of its products/services</p> <ul style="list-style-type: none"> • Foreign network partners exert influence on its internationalisation decisions, as well as on its selection of foreign markets and entry modes
Internationalisation Process Model	<ul style="list-style-type: none"> • Little explanatory value for international start-ups since they exhibit very rapid internationalisation and do not base commitment decisions on gradual experiential learning and risk aversion

Table 4.2: Internationalisation Framework Relationships to International Start-ups

(Source: the author, derived from the literature)

4.3 EXISTENCE AND EMERGENCE OF INTERNATIONAL START-UPS

Academic researchers as well as the OECD (1997) have recently noted the world-wide emergence of new ventures that are international from inception, thereby deviating from traditional internationalisation models (Rennie, 1993; McDougall, Shane and Oviatt, 1994; Brush, 1995; Knight and Cavusgil, 1996; Lindqvist, 1997; Oviatt and McDougall, 1997; Knight, Madsen, Servais and Rasmussen, 2000). These firms view their marketplace as being international in nature and pursue world-wide opportunities from the outset. They possess geocentric mindsets (Perlmutter, 1969; Chakravarthy and Perlmutter, 1985) from the beginning and source and employ their resources as well as sell their products and services in strategic international locales. These unique enterprises have been labelled by a variety of terms, including ‘born globals’, ‘high technology start-ups’, ‘international new ventures’ and ‘global start-ups’ (Madsen and Servais, 1997). Research suggests that these international start-ups are becoming increasingly common and represent the vanguard of an emerging business phenomenon (Rennie, 1993; McDougall, Shane and Oviatt, 1994; Oviatt and McDougall, 1995; Madsen and Servais, 1997; Knight et al., 2000).

Rennie (1993) noted the sharp rise of small and medium-sized (SME) “born global” firms in his study of 310 Australian high value-added manufacturing exporters. He found that the average firm began exporting within two years of founding and had export sales accounting for 76% of total firm sales. Furthermore, the study indicated that these firms were successfully competing against larger, established international players. Interestingly, the author stated that born global SMEs were responsible for 20% of new trade growth in Australia. While this study focused on born global exporters, these firms cannot be properly classed as global start-ups. Rennie indicated that the SMEs in his study exported to numerous and geographically dispersed countries. However, there were few, if any, value chain activities located outside Australia. Therefore, while the author utilises the term born global to describe these firms, they are more accurately classed as international start-ups. Thus, the findings are highly relevant and insightful to this study of small international start-ups since they provide evidence of the emergence of SMEs that are international from inception.

McDougall, Shane and Oviatt (1994) examined 24 international new venture (i.e. international start-up) case studies. Their methodology included reviewing company documents and products as well as conducting personal interviews. Their study led to three important conclusions pertaining to the emergence of international start-ups. First, they are not a local phenomenon. There is evidence of the existence of international start-ups in Europe, North America, South America, Asia, the Middle East and the South Pacific. Second, international start-ups appear to be a relatively new phenomenon, since many of the firms examined were formed in recent years. And third, they conducted business in a multitude of industries including service industries, although most were engaged in high technology fields. The study provides further empirical evidence of the existence and emergence of international start-ups.

Two additional studies supporting the existence and emergence of international start-ups warrant acknowledgement. Lindqvist’s (1997) study of 95 small technology-based Swedish firms found strong evidence of rapid internationalisation,

international orientation at inception, operations in a multitude of countries and the employment of value chain activities across nations. Finally, Brush's (1995) study of firm age and internationalisation provided further evidence of the existence and emergence of international start-ups. 13% of her nation-wide random sample of 134 small internationalised US manufacturers engaged in international activity during their first year of business.

Collectively, these studies provide cogent empirical evidence of the existence and emergence of international start-ups. Furthermore, the study findings provide support for Oviatt and McDougall's (1994) international new venture paradigm. More recently, Bell, McNaughton and Young (2000) found evidence of a related emerging phenomenon, 'born-again global' firms. These firms differ from international start-ups in that they begin as domestic firms but suddenly and rapidly internationalise. The study, which encompassed a case study methodology of firms in the UK, Australia and New Zealand, found that the sudden and rapid internationalisation was triggered by one or more 'critical incidents' or 'episodes' such as a change of ownership, acquisition or client followership. Having established the existence and emergence of international start-ups, it is crucial to understand the factors influencing their formation. This topic is examined in the following section.

4.4 FACTORS INFLUENCING THE FORMATION OF INTERNATIONAL START-UPS

The previous section documented the advent of international start-ups. A list of explanatory factors accounting for this emergence will now be delineated. This section reviews empirical literature pertaining to factors influencing their formation and facilitates an understanding of the reasons and circumstances leading to their distinctive early internationalisation. The findings of numerous empirical studies will be outlined, followed by a summarising framework.

Brush's (1995) study of 134 small internationalised US manufacturers enhances academic knowledge of the driving forces for early internationalisation. The study included an examination of the reasons why companies sold abroad based upon their age at initial internationalisation. Table 4.3 provides a list of the most important reason for selling abroad cited by firms less than six years old at the time of internationalisation, along with a comparative list of reasons for firms older than seven years at the time of internationalisation. The two dominant reasons or factors influencing early internationalisation were found to be to *fill foreign customer requests* and *management's personal knowledge of the existence of foreign markets*. This second factor was found to be rather insignificant for older firms. This can be intuitively attributed to the influence of the founder(s) and the entrepreneurial nature of young firms. While this study does not directly address the driving forces for the formation of international start-ups, it nevertheless provides key insights into factors influencing their early internationalisation.

Reason	<6 Years Old at Internationalisation	>7 Years Old at Internationalisation
To fill customer request	20%	30%
Personally knew market existed	20%	5%
To increase sales and profits	14%	15%
To broaden markets	11%	19%
Demand for product	8%	4%
Opportunity	7%	--
Personal contacts	6%	--
Followed customers	--	7%
To develop new market	--	5%
Other	14%	15%
Total	100%	100%

Table 4.3: Reasons Why Firms Sell Abroad

(Source: Brush, 1995)

Oviatt and McDougall conducted an extensive qualitative study of six international start-ups and concluded that six factors played a crucial role in influencing their creation (McDougall and Oviatt, 1991; Oviatt, McDougall, Simon and Shrader, 1991, 1993). The first factor noted was the *international/global vision of the founders*, whereby they sought to procure the best resources, including human resources, at the lowest prices, no matter where in the world they were located. The second factor was the *need to obtain financing*, which may be easier and less costly in international markets. The third factor was the necessity in some industries to expand beyond domestic markets in order to achieve *economies of scale*, as well as to provide *additional market opportunities*. The fourth factor was the need to *rapidly respond to competitor initiatives world-wide*, particularly in light of advancements in global communications. The fifth factor was the need to *exploit a proprietary technology or process internationally* in order to *set a world-wide standard* and *pre-empt competitors*. Finally, the sixth factor was to *avoid the complications associated with altering domestic inertia* and shifting to international markets following a period of exclusive home market operations. Whereas the findings of Oviatt and McDougall's study were based on observations from only six international start-ups, as will be illustrated they are supported by other studies performed by researchers spanning several continents.

Coviello and Munro (1995) conducted four in-depth case studies of entrepreneurial firms in the New Zealand software industry. They found that the rapid internationalisation of these firms across a number of geographically dispersed countries was influenced by several factors. First, the *highly competitive nature of their international industry* along with its relatively *short product life cycles* demanded rapid internationalisation in order to successfully compete and survive. The international nature of the industry driver was later supported by Rasmussen, Madsen and Evangelista (2001). Second, since the *size of the domestic market* for the firms was very limited, rapid international expansion was essential in order to achieve growth. This small domestic market driver was further supported by the studies of Lindqvist (1990, 1997) and Madsen and Servais (1997). Finally, the *influence of the firms' network partners* provided a catalyst for rapid

internationalisation. This influence exerted by network partners was later supported by Roberts and Senturia's (1996) qualitative study of 19 US based international start-ups in the computer industry. Whereas the firms in Coviello and Munro's study cannot be precisely classed as international start-ups due to their lack of being international from inception, although they exhibited early and rapid internationalisation, they nevertheless mirror the key traits and attributes of international start-ups and as such provide an understanding of the factors influencing their formation.

Bloodgood and Sapienza's (1996) study of the internationalisation of 61 new high-potential US ventures shed additional light on factors influencing the formation of international start-ups. They found that these firms sought initial international presence because either *industry conditions* required it in order to be competitive or to *capitalise on its unique set of resources*. Examples of these resources are the founding management team's international experience or the firm's new technologies and innovations. The impact of the *founders' international experience* as an influential factor was supported by the studies of Oviatt and McDougall (1995), Roberts and Senturia (1996) and Madsen and Servais (1997). Bloodgood and Sapienza (1996) further found that the *increasing homogeneity of international markets* as well as *major advances in international communications and transportation* has both enabled and spurred rapid internationalisation. The homogeneity of international markets finding and its resulting simplification and opportunities was supported by Bloodgood, Sapienza and Almeida (1995) and Madsen and Servais (1997), while the advances and cost reductions in international communications and transportation factor dovetailed with *advances in information and process technologies* and was supported by Oviatt and McDougall (1994), Knight and Cavusgil (1996) and Fraser and Oppenheim (1997). Since the firms in Bloodgood and Sapienza's study approximated the characteristics of international start-ups, the findings are highly relevant to the determination of factors influencing their formation.

Numerous additional factors influencing the formation of international start-ups exist. In conjunction with McDougall and Oviatt's (1991) foreign financing driver, Fraser and Oppenheim (1997) noted the *growth, mobility and integration of the world's financial markets* as a driver of rapid internationalisation. The advent of increased specialisation leading to *international niche markets* and their subsequent targeting has also been found to be a significant influential factor (Lindqvist, 1990, 1997; Knight and Cavusgil, 1996; Madsen and Servais, 1997; Keeble et al., 1998). Lindqvist (1990, 1997) further noted that *high research and development costs*, particularly in industries characterised by continuous innovation, might require a company to be international at or near inception in order to recoup its expenses and be economically viable. Roberts and Senturia (1996) found that a key driver of early and rapid internationalisation was the *external "pull" exerted by a firm's domestic and international customers*. Another influential factor identified was the need to *avoid intense or direct competition in a firm's domestic market* (Jolly, Alahuhta and Jeannet, 1992; Shrader, Oviatt and McDougall, 1996).

Two final factors influencing the formation of international start-ups are of paramount importance. First, the increasing irrelevance of national borders leading to a '*borderless world*' as trade regulations and barriers diminish provide unprecedented opportunities for international start-ups to transact business throughout the global economy (Ohmae, 1990, 1995; Rennie, 1993; Fraser and Oppenheim, 1997). And second, the creation of international start-ups is influenced by *alert international entrepreneurs* who envision international opportunities and capitalise on *international market imperfections* by linking resources from around the world (McDougall, 1989; Oviatt and McDougall, 1994).

Before concluding this section it is imperative to consider specific factors influencing the formation of small high technology international start-ups, since this type of firm is the focus of this thesis study. Small high technology firms are often driven to be international at or near inception as a result of the idiosyncrasies of their industry. Empirical studies indicate that small high technology firms are frequently required to engage in early internationalisation in order to survive, grow and succeed (Litvak,

1990; Coviello and Munro, 1995; Oakley, 1996). The studies found that small high technology firms were driven to internationalise early in their existence due to the *accelerated pace of world-wide technological innovation*, leading to *shortened product life cycles*, which coupled with the *high costs of R&D* effectively precludes exclusive domestic orientation if a firm's financial goals are to be achieved. Furthermore, the studies found that *intense international competition* and the *extensive internationalisation of their high technology industries* necessitated rapid internationalisation.

This section has delineated the findings of several empirical studies identifying factors influencing the creation of international start-ups. Figure 4.2 provides a summary of these influential factors, which are clustered under the categories of internal firm factors, external factors (i.e. industry and competitive environment) and facilitating factors. While numerous factors have been chronicled in this section, much work remains (Knight and Cavusgil, 1996; Madsen and Servais, 1997). A general framework illustrating factors influencing the creation of international start-ups is lacking. This thesis will address this gap in the literature by qualitatively and quantitatively identifying key factors influencing small high technology start-ups to be distinctly international in nature at or near inception.

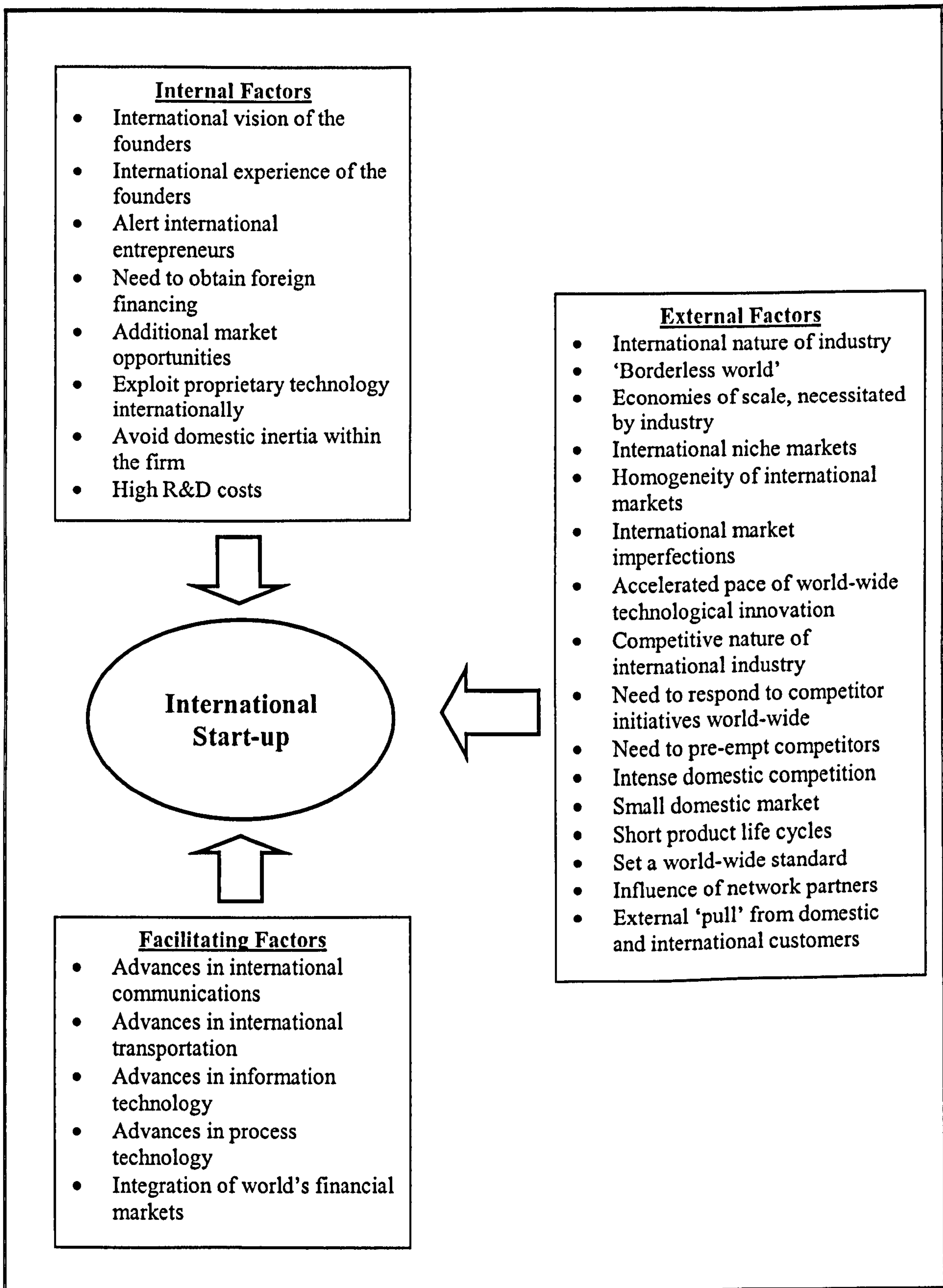


Figure 4.2: Factors Influencing the Formation of International Start-ups

(Source: the author, derived from the literature)

4.5 CHARACTERISTICS OF INTERNATIONAL START-UPS

International start-ups possess numerous distinguishing characteristics. The most striking difference between these firms and traditional companies is the view of their founders and top management teams that the *world is their marketplace* as opposed to international markets being an adjunct to domestic markets (McKinsey & Co., 1993; Harveston, Kedia and Davis, 2000). This *international vision from inception* is held by the founding international entrepreneurs, who visualise international opportunities and develop the means for their exploitation (McDougall, 1989; McDougall, Shane and Oviatt, 1994; Oviatt and McDougall, 1995; McDougall and Oviatt, 1997). International start-ups frequently *target large and leading industry markets world-wide* early in their existence (Jolly, Alahuhta and Jeannet, 1992; Oviatt and McDougall, 1995; Bell, 1995; Lindqvist, 1997). Furthermore, they commonly employ foreign value chain activities early-on in order to *establish a physical presence in key foreign markets* and to *enhance regional sales and service support* (Litvak, 1990; Lindqvist, 1997).

In conjunction with an international vision, the founders and top management teams of international start-ups often have *extensive industry and international business experience* (Mamis, 1989; Oviatt and McDougall, 1995; Madsen and Servais, 1997; Harveston et al., 2000). Empirical studies have demonstrated the significance of this experience to the ultimate success of the start-up (Jolly et al., 1992; Oviatt and McDougall, 1995; Bloodgood, Sapienza and Almeida, 1995). Industry experience enables entrepreneurs to both envision international opportunities and obtain crucial knowledge of the product/service, distribution chain and customers, which serve as the foundation for the new venture (Shrader, Oviatt and McDougall, 1996). International experience provides critical knowledge of the mechanics for conducting international business, for example in the areas of financing, transportation, and the cognition and respect of cultural differences (Oviatt and McDougall, 1995; Burgel and Murray, 2000). Additionally, international experience provides knowledge of foreign markets and facilitates the recognition of opportunities (Bloodgood et al., 1995; Shrader et al., 1996; Madsen and Servais, 1997).

International start-ups often *enter volatile and rapidly changing industries* (Oviatt and McDougall, 1994; Shrader et al., 1996). While a *large percentage of international start-ups are high-technology oriented, others are in service and low-technology industries* (The Economist, 1993; McDougall, Shane and Oviatt, 1994; Oviatt and McDougall, 1994). Their *product lines are usually narrowly focused* and their *products are often innovation oriented* (Rennie, 1993; Shrader et al., 1996) and involve substantial value adding (McKinsey & Co., 1993). For example, major growth has recently been experienced in the number of US small international start-ups producing medical products, scientific instruments, environmental systems and computer-related products (Knight and Cavusgil, 1996). They tend to *operate in international niche markets* (Knight et al., 2000), where their *flexibility and swift response capabilities* provide competitive advantage (Rennie, 1993; The Economist, 1993). Furthermore, niche markets enable small international start-ups *to avoid or minimise direct competition with larger, established companies* (Knight and Cavusgil, 1996, Knight et al., 2000).

The possession of a *unique intangible asset* is a common attribute of a small international start-up and is paramount to its survival (Oviatt and McDougall, 1994, 1995). Successful international start-ups almost always depend on *unique knowledge* such as *patented technology* or *superior techniques and processes* in order to achieve sustainable competitive advantage (McDougall, 1989; McKinsey & Co., 1993; Oviatt and McDougall, 1995). The exploitation of their intangible assets, such as unique knowledge, often results in a marketplace where they have *virtually no competitors* (Rennie, 1993).

Due to their infancy and common small size (McKinsey & Co., 1993), international start-ups generally *lack the critical resources required for their operation* (Oviatt and McDougall, 1994). Oviatt and McDougall (1994) contend that these resource constraints result in international start-ups *owning a smaller percentage of key assets* than do mature organisations. International entrepreneurs forming international start-ups generally *minimise internalisation* and subsequently *rely on alternative*

governance structures and methods for controlling many vital assets. One method is through the *use of hybrid structures* such as licensing and franchising (Oviatt and McDougall, 1994; McDougall, Shane and Oviatt, 1994). Another frequently utilised method is the *establishment of strategic alliances*, enabling access to foreign alliance partner resources such as manufacturing capacity or established marketing channels (Jolly et al., 1992; Oviatt, McDougall, Simon and Schrader, 1993; Oviatt and McDougall, 1994, 1995; McDougall and Oviatt, 1997).

A final resource conservation method is the *utilisation of networks*. Many international start-ups *rely on social and business networks* to facilitate their international operations (Shrader, Oviatt and McDougall, 1996; Coviello and Munro, 1997; Madsen and Servais, 1997). These networks are informal and operate on trust rather than contracts, thereby conserving critical resources (Oviatt and McDougall, 1994). International entrepreneurs often have extensive international experience and have built up a network of trusted financiers, suppliers, and distributors (Oviatt and McDougall, 1995). These social and business networks help overcome some of the limitations of distance, political boundaries, and lacking capabilities inherent in the initial engagement of international business (Shrader et al., 1996).

While the international start-up characteristics delineated in this section are common and typical, they nevertheless lack universality. Numerous differentiating variables (e.g. industry and culture) inhibit international start-up characteristic typification. This is exacerbated by the relative newness of the phenomenon and the resulting limited nature of academic knowledge of international start-ups (Madsen and Servais, 1997). Despite these limitations, a general profile of an international start-up has been constructed and is presented in Table 4.4. The impact of the characteristics outlined in this section, along with numerous additional attributes, on the success of international start-ups will be examined in Chapter 5.

	Common International Start-up Characteristics
Type of Organisation	International new venture; international at or near inception
Size	Generally small
Scope and Initial Country Market Selection Factors	Conduct business world-wide in large and leading industry markets
Foreign Value Chain Activities and Factors Influencing their Establishment	Foreign-based organisational activities commonly employed in order to establish a local presence in key industry markets and to provide enhanced regional sales and service support
Structure	Minimal internalisation; utilisation of alternative governance structures including strategic alliances and networks
Marketplace	World; geocentric mindset; international vision
Industry	Generally high technology industries, but also found in low technology and service industries
Products	Innovation oriented; narrow product lines; international niche markets
Competitive Advantage	Unique intangible asset; often unique technological knowledge or superior processes
Experience	Extensive founder/top management team industry and international experience

Table 4.4: Common International Start-up Characteristics

(Source: the author, derived from the literature)

4.6 INTERNATIONAL START-UP STRATEGY

Founding a new business venture is both highly challenging and perilous. Adding an international dimension greatly compounds the challenges and risks. Therefore, an intricate and tightly woven strategy is essential in order to facilitate the success of an international start-up. Prescribing a universal winning strategy for international start-ups is problematic and imprudent due to the impact of various industry and product idiosyncrasies, as well as other environmental variables, on appropriate individual

company strategy (McDougall, Robinson and DeNisi, 1992; McDougall, Covin, Robinson and Herron, 1994). However, general strategic components applicable to most international start-ups can be discerned from the literature. This section will synthesise the findings of empirical studies examining common strategic elements associated with successful international start-ups. Methodological details of the studies cited will only be provided if they were not previously described in this chapter.

McDougall (1989) conducted a study to determine differences between the strategies of domestic and international new ventures. Her methodology consisted of quantitative analysis of 188 surveys from domestic and international new ventures within the computer and communications equipment manufacturing industries. She concluded that stark differences existed between the strategies of the two classes of start-ups. Of particular relevance to this section is the findings related to distribution and marketing strategy and entry strategy. The distribution and marketing strategy of international start-ups was found to be characterised by:

- *broad market coverage through developing and controlling multiple distribution channels*
- *service of many customers in diverse market segments*
- *developing a high level of market/product visibility*

The entry strategy of international new ventures was found to emphasise:

- *entering numerous international markets on a grand scale, facilitated by securing outside financial and production resources*
- *obtaining patent technology*

McDougall's findings were later supported by other empirical studies. The entering of numerous international markets on a grand scale finding was supported by Roberts and Senturia's (1996) *aggressive foreign market entry* strategy finding in their qualitative study of 19 US internationalising high technology companies. The

securing of outside financial and production resources finding was supported by Shan's (1990) finding of the significance of an *international co-operative strategy* in expediting rapid international expansion in the wake of relatively short innovative product life cycles in his study of high technology entrepreneurial firms. The obtaining of patent technology finding is consistent with Baird, Lyles and Orris's (1994) conclusion in their international strategies for small businesses study that *patent or manufacturing capability* and *process changes* are the cornerstones of these companies' international strategies.

Whereas McDougall's (1989) study provides highly insightful data on commonly employed international new venture strategies, its precise applicability to this study is somewhat limited. For purposes of the study McDougall classifies international new ventures as start-ups with international sales exceeding 5% of total firm sales. While this criterion demonstrates at least some international orientation, it fails to capture the international vision and commitment characterising international start-ups. Nevertheless, the study's international new venture focus approximates that of international start-ups and the findings are therefore fundamentally idiosyncratic.

Jolly, Alahuhta and Jeannet's (1992) study of international start-up strategies is particularly relevant and insightful to this review. Their methodology consisted of four in-depth case studies of high technology start-ups that competed internationally. The companies selected in the study can be classed as international start-ups since they meet the definitional criteria previously set forth. Each start-up competed in international markets from the beginning as well as co-ordinated many value chain activities across the numerous geographically dispersed countries in which it conducted business. Furthermore, they are all involved in high technology industries, which is a common international start-up characteristic and consistent with the focus of firms in this thesis study. While caution should be exercised about drawing international start-up strategy generalities based on only four case studies, the findings are further supported by additional studies, which will be subsequently outlined.

Seven strategic components leading to success for international start-ups emerged from Jolly et al.'s (1992) study. The authors contend that a winning strategy for international start-ups entails the collective implementation of all seven strategic elements. The first strategic component is an *international vision from the beginning* of the firm by its founders. This serves to set the international mindset of the firm from its origin and allows it to visualise and pursue international opportunities and markets. The second strategic component is a *product that is high quality, innovation oriented and rides on an industry change or shift*. The authors note the importance of *early entry* and finding a *niche within an industry transition*. The third strategic component is a *standardised product* coupled with *early success in lead markets*. Whereas the debate over the appropriateness of standardisation versus adaptation of products in an international strategy continues to rage (Douglas and Wind, 1987; Ghoshal, 1987), resource deprivation suffered by most international start-ups precludes significant product adaptation. A more prudent international start-up strategy is one that emphasises *minimal product and marketing mix adaptation* and *targets homogeneous market segments world-wide*. The authors further point out that many international start-ups act as original equipment manufacturers (OEMs) in their early growth stages. Early lead market presence and success is also crucial in order to *pre-empt competition* and *serve as a learning experience for other markets subsequently entered*.

The fourth strategic component is *broad and rapid market access*, often employing alliances, which supports McDougall's (1989) findings. In order to offset high R&D, manufacturing and other start-up costs, large markets must be targeted quickly due to short product life cycles in rapidly changing industries, as well as to generate critical cash flow allowing the continuance of operations. International start-up growth is often facilitated by the *utilisation of strategic alliances*, since they frequently lack resources, market access and an international presence. Successful international start-ups commonly *focus on their core competencies* such as product development and manufacturing and *rely on alliances for other critical value chain activities*, such as marketing and sales.

Jolly et al.'s (1992) fifth strategic component is making *selective international investments*. As previously discussed, resource deprivation mandates *minimal internalisation* and leads international start-ups to develop strategic alliances. However, successful international start-ups *do not develop long-term dependence on the alliances*, opting instead to engage in foreign direct investment in key value chain activities as they are able. Furthermore, Almeida and Bloodgood (1996) found in their international start-up study that these firms are more likely to invest in foreign downstream activities (marketing and sales and service) than in upstream activities (inbound logistics, operations and outbound logistics), supporting Porter's (1986) contention that it is a higher imperative to locate downstream activities closer to the buyers. Jolly et al.'s sixth strategic component is the necessity to *add follow-on products* in order to avoid single product dependency and broaden the company's breadth of competence. Finally, the seventh strategic component is the need for a *tightly networked global organisation*, co-ordinated as a single global entity.

Rennie's (1993) study, the methodology of which was described earlier in the chapter, provides further insight into common, effectual international start-up strategy. His McKinsey & Co. research found that international start-ups successfully compete with larger, established companies by employing several strategic tactics. The findings indicate that they *compete on quality and value, at competitive prices*. Successful international start-ups were found to *create value through innovative technology and product design*. They *emphasise customer satisfaction* and *strive to be the best in the world* at meeting particular customer needs in order to effectively eliminate competition. Finally, they *operate in niche markets* and *utilise flexibility and rapid response capabilities* as a means of attaining competitive advantage. Rennie's study provides support for Jolly et al.'s (1992) international start-up strategy findings of producing high quality, innovative products and operating in niche markets.

McDougall, Shane and Oviatt's (1994) study of international start-ups, the methodology of which was likewise described earlier in the chapter, provides further support for Jolly et al.'s findings. The study highlighted the strategic importance of

conserving limited international start-up resources by *employing hybrid governance structures* such as strategic alliances and international networks. The *international vision of the founders* was another key strategic component noted in the study. The authors assert that engaging in international business from inception creates international business competencies and avoids subsequent problems that may be encountered when shifting from a domestic orientation to an international company.

Oviatt and McDougall's (1995) study of international start-ups renders further empirical evidence of successful strategy components. The methodology consisted of extensive interviews with 12 US and European international start-up firms. A correlation of several strategic elements to the survival or failure of the firms in the study was made. The findings included additional confirmation of the importance of the *founders' international vision* strategy in shaping an effective international organisation. In conjunction with this, the founding strategy should include the retaining of a top management team with *extensive international experience* and the possession of *strong international business networks*. Other successful strategic components noted were the value of an *unique intangible asset* such as unique knowledge and the imperatives of *continual innovation* and *close co-ordination of world-wide value chain activities*, which supports Jolly et al.'s and Rennie's findings. Oviatt and McDougall's (1995) study also supports Lindqvist's (1990) findings that *international vision, foreign commitment, unique products* and *continuous innovation* were key strategic components for internationalising small high technology firms.

Oviatt and McDougall (1995) observed the significance of two additional strategic components in their study. First, successful international start-ups were found to employ *pre-emptive technology or marketing*. Being a *first mover* with a *unique product or service* in *leading markets* was noted to be a crucial strategy for enhancing the likelihood of success, which supports Jolly et al.'s findings. Second, successful international start-ups were found to *follow their initial product or service with closely linked extensions*, such as selling supplies or providing consulting services, thereby providing diversification and supplementing cash flow.

This section has highlighted the findings of several empirical studies examining international start-up strategies. Table 4.5 provides a synthesis of these findings categorised by type of strategy. While the strategies outlined are not universal and vary according to industry and specific firm product and circumstances, they nevertheless represent common strategic components that have led to the success of international start-ups. International start-ups that collectively employ these strategies mitigate the substantial risk associated with these new ventures, which is the topic of the following section.

	Common International Start-up Strategies
Founding Strategies	<ul style="list-style-type: none"> • Instil an international vision throughout the organisation • Hire managers with extensive international experience and strong international business networks
Product / Service Strategies	<ul style="list-style-type: none"> • Unique, high quality products or services • Innovative technology and product design • Patent technology • Superior processes • Product rides on industry change or shift • Niche within an industry in transition • Product differentiation • Standardised product • Minimal product adaptation • Compete on quality and value • Competitive prices • Continuous innovation • Follow-on products • Closely linked product/service extensions
Distribution / Marketing Strategies	<ul style="list-style-type: none"> • Target homogeneous market segments world-wide • Broad market coverage • Service of numerous customers in diverse market segments • Develop and control multiple distribution channels

	<ul style="list-style-type: none"> • Minimal marketing mix adaptation • Develop a high level of market/product visibility • Emphasise customer satisfaction
Entry Strategies	<ul style="list-style-type: none"> • Aggressive foreign market entry • Enter numerous international markets on a grand scale • Broad and rapid market access • International co-operative alliances • Utilisation of alternative/hybrid governance structures such as strategic alliances and networks • Secure outside financial and production resources • First mover / early entry • Early success in lead markets • Pre-empt competition • Selective international investments (foreign direct investment) • Minimal internalisation • Negate long-term dependence on alliances • Focus on core competencies • Learning experience for subsequent market entry • Flexibility and rapid response employment • Tightly networked international organisation

Table 4.5: Common International Start-up Strategies

(Source: the author, derived from the literature)

4.7 INTERNATIONAL START-UP RISK

International start-ups face many intrinsic risk factors that threaten their survival. The risk stems from the dovetailing of risks associated with any new venture with those of international operations. While founding a new venture and internationalisation are both regarded as being inherently risky, the creation of an international start-up greatly compounds the risk (Oviatt and McDougall, 1995; Shrader, Oviatt and McDougall, 1996). Harveston et al. (2000) found in their

quantitative study of US high technology firms that the top managers of international start-ups have significantly higher levels of risk tolerance than those of gradually internationalising firms. New venture risk manifests from the firm's newness and small size, which equates to liabilities such as inexperience, lack of an operating infrastructure and severely limited resources. Conducting international business exposes a firm to political, foreign exchange and international economic risks. Thus, international start-ups must contend with and mitigate these risks in order to survive and prosper. This section will outline several specific risks endemic to international start-ups and provide measures to effectively minimise them.

As previously discussed in this chapter, international start-ups commonly utilise alternative and hybrid governance structures such as strategic alliances to counteract their characteristic resource deprivation. However, this activity exposes the firm to a relatively high level of risk of alliance or hybrid partner opportunism or asset expropriation (Oviatt and McDougall, 1994; McDougall, Shane and Oviatt, 1994). Despite the realisation of this risk, international start-ups are frequently compelled to engage in such resource conservation measures in order to conduct international operations since they lack the required resources to internalise essential value chain activities. International start-ups can mitigate this risk by selecting hybrid partners that are part of their personal networks in order to enhance trust and operate on a moral foundation (Oviatt and McDougall, 1994; McDougall, Shane and Oviatt, 1994). Additionally, international start-ups should minimise long-term dependence on alliance and hybrid partners in order to reduce their risk exposure.

Another prevalent international start-up risk is the dependence on a single product (Jolly et al., 1992). International start-ups often originate from the basis of a sole product that is innovative and niche market oriented. While this is the basis for their competitive advantage, it also increases the vulnerability of the firm. Short product life cycles in the rapidly changing industries in which these firms typically operate make the continuance of the firm problematic if relying on a single innovation or product. Furthermore, a single product may not generate sufficient or timely cash flow critical for the sustenance of operations. In order to reduce these risks,

international start-ups should develop follow-on products soon after their original innovation and adopt a policy of continual innovation (Jolly et al., 1992).

This section has highlighted some of the key risks encountered by international start-ups. While the risks are substantial, they are surmountable. International start-ups can and do succeed. Success is achieved in part by the development and implementation of a detailed strategic plan that identifies specific risks facing the firm and stipulates action to be taken to eliminate or minimise them. In addition to the risk management techniques previously noted in this section, international start-ups can manage risk by assessing the risk of each country-market entered, analysing the risk associated with entry mode alternatives, adjusting their level of FDI and determining the firm's optimal degree of foreign market dependence (i.e. adjusting the proportion of foreign sales to total firm sales). Managing risk facilitates the successful performance of international start-ups, which is the topic of the following section.

4.8 INTERNATIONAL START-UP PERFORMANCE

Evidence of successful international start-up performance exists. While studies chronicle both their successes and failures, there is substantial evidence that international start-ups can compete and prosper. Despite performance evaluation being subjective and problematic, as well as greatly impacted by industry and environmental variables, generalities can still be drawn. This section reviews the findings of international start-up performance studies. Methodological descriptions of the studies not previously outlined in this chapter will be provided.

Jolly et al.'s (1992) study of how high technology start-ups compete internationally against established multinational companies led to their conclusion that international start-ups can successfully compete when appropriate strategy is implemented. Their case studies indicated that international start-ups can be viable international players in a relatively short period of time. While recognising the advantages of larger,

established multinational companies, the study found that the employment of a specific set of strategic components renders a winning strategy for international start-ups and facilitates successful performance. The study's specific strategy findings were delineated in Section 4.6.

Rennie (1993) found that international start-ups were successfully competing against larger, established international companies in his study of Australian high-value-added manufacturing exporters. The firms in the study successfully performed in international markets from inception. The author noted the rise in the number of international start-ups and indicated that they were winning against larger, mature players world-wide. The strategies found to lead to the successful performance of these firms were outlined in Section 4.6.

Oviatt and McDougall's (1995) study of successful international start-up characteristics highlighted both successes and failures. The study indicated that while some international start-ups achieve high levels of performance and create value, others fail. While numerous variables determine their ultimate fate, the study found that the presence of specific success characteristics facilitated successful performance. These success characteristics were previously discussed in this chapter and will be examined in detail in Chapter 5.

Roberts and Senturia's (1996) study of the internationalisation of emerging high technology companies provides further insight into international start-up performance. Their methodology consisted of in-depth interviews with 19 US based computer software and peripheral product firms with the intent of exploring rapid internationalisation patterns. The characteristics of the firms (e.g. new, small, rapid and wide geographic scope) in the study approximated those of international start-ups, making the findings relevant to this review. While international start-up performance was not the focus of the study, it was noted that these firms generally performed well and effectively competed in international markets.

Finally, McDougall and Oviatt (1996) examined the impact of internationalisation on new venture performance. Their methodology involved a longitudinal study surveying 62 US new ventures in the internationalising industries of computer and communications equipment manufacturing. They found that early new venture internationalisation in these high technology industries was associated with higher relative market share in subsequent years, but not associated with return on investment (ROI). Put in other terms, internationalisation by itself was found to not increase the financial performance or profitability of new ventures. The authors posited that in order to be successful, new ventures must include internationalisation as part of their overall organisational strategy rather than being an adjunct to domestic strategy. Furthermore, the authors speculated that their surprising profitability findings may be the result of the 2 year time period of their longitudinal study not being long enough for costly international operations and investments in higher market shares to equate to enhanced profitability. While the study's results are somewhat enigmatic, they suggest that rapid new venture internationalisation leads to higher market share and longer-term superior performance.

Collectively, the studies described in this section support the contention that international start-ups can and do compete successfully in international markets. Although inherently risky, as discussed in the previous section, the implementation of appropriate strategy can clearly lead to successful performance. While many international start-ups fail, others succeed and evolve into global industry leaders.

4.9 CONCLUSIONS

This chapter examined the theoretical underpinning and empirical evidence of international start-ups. International start-ups were found to exhibit idiosyncratic differences from traditional small firms and start-ups. The principal differences emanate from the international orientation of international start-ups from their inception, as opposed to the initial domestic focus and possible subsequent gradual international business expansion of conventional new ventures. While most

independent start-ups possess limited resources, the resources of international start-ups are strained to a greater extent due to their international scope. As a result, international start-ups have a higher propensity to engage in resource conserving governance structures such as strategic alliances and network relationships. The chapter has further shown that differences between international start-ups and traditional small firms and start-ups exist in terms of their formation drivers, organisational characteristics, strategy and risks.

The chapter has provided a foundational understanding and description of international start-ups. This concluding section will narrow the focus by profiling small high technology international start-ups, since these firms are the topic of this thesis study. While the firms in the empirical studies illustrated in the chapter embodied a wide range of industries and sectors, they predominantly represented high technology industries. Furthermore, many of the studies involved small firms. Therefore, the chapter findings are biased towards small high technology international start-ups. This is desirable for two reasons. First, most international start-ups are small-sized and many operate in high technology industries. Thus, the findings are largely representative of the preponderance of international start-ups. And second, it captures the essence of the specific type of firm involved in this thesis study. Although the chapter findings are biased towards small high technology international start-ups, the ensuing profile was assimilated from studies specifically involving this class of firms.

Figure 4.3 provides an organising framework for small high technology international start-ups. The framework commences with theoretical explanations for their existence and manifestations. The resource-based perspective applied to internationalisation, network approaches to internationalisation, entrepreneurship perspectives and the international new venture paradigm holistically provide a partial explanation and as depicted in the framework, facilitate an understanding of international start-ups. Next, key factors influencing their formation are identified, which play a role in the understanding of their organisational characteristics. These influencing factors include: the international vision of the founders, having a small

domestic market, the rapid pace of technological innovation, shortened product life cycles, the high costs of R&D, international competition and the internationalisation of high technology industries. The organisational characteristics of small high technology international start-ups as delineated in the framework are its: international orientation at or near inception, frequent initial small size, conduction of business in numerous geographically dispersed countries, common employment of foreign value chain activities, engagement in and reliance on strategic alliances and network relationships, having innovative products and operating in international niche markets, and founders and top managers possessing extensive industry and international business experience.

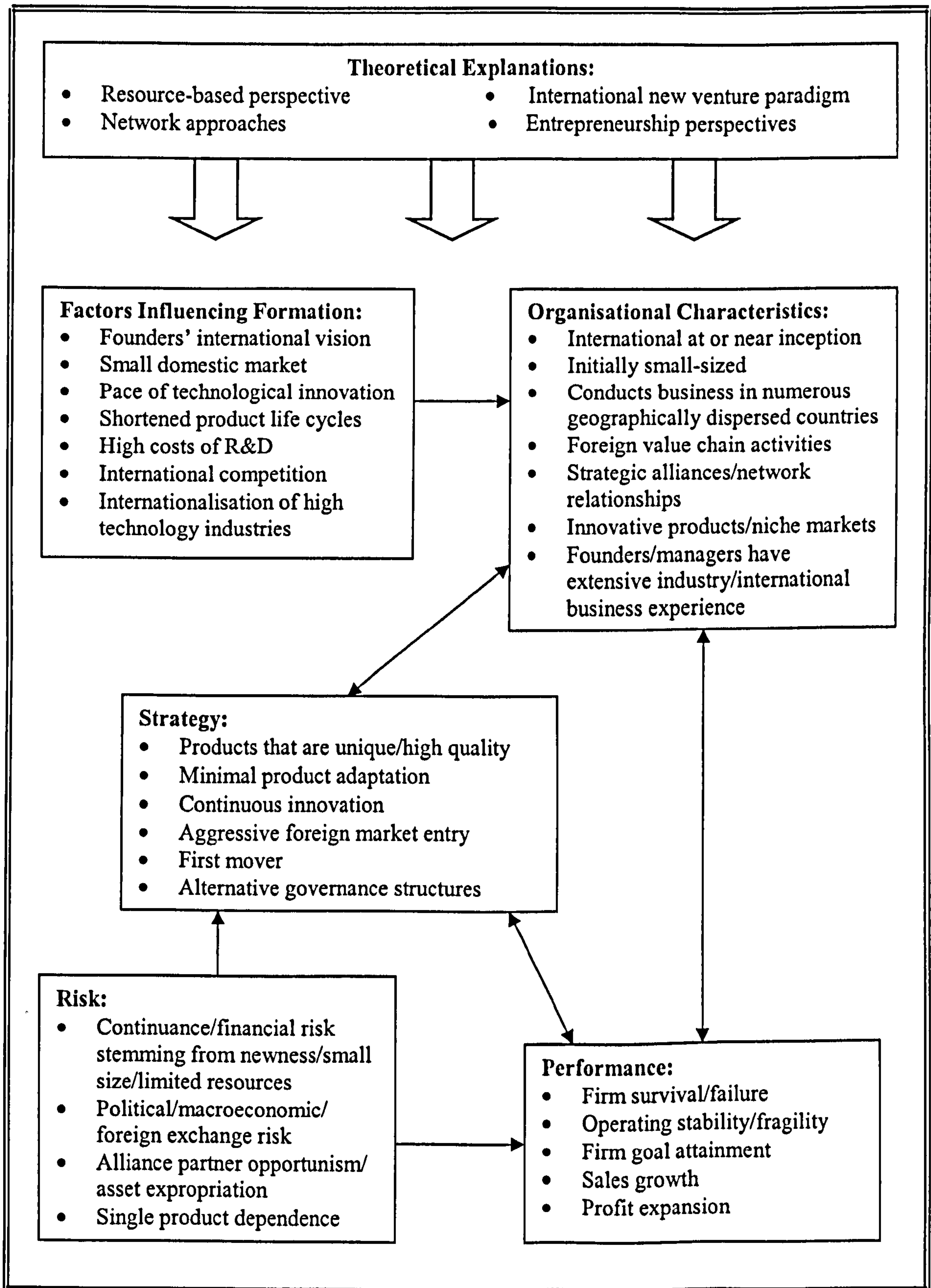


Figure 4.3: Small High Technology International Start-up Organising Framework

(Source: the author, derived from the literature)

The organisational characteristics of small high technology international start-ups impact their strategy and are subsequently impacted by their strategy, as depicted in the framework. Put another way, organisational characteristics and capabilities influence and confine the formulation of strategy and in turn strategy implementation results in the reconfiguration of organisational characteristics. Strategic components noted in the framework include: products that are unique and of high quality, minimal product adaptation, continuous innovation, aggressive foreign market entry, being a first mover and the employment of alternative governance structures to conserve limited internal resources and access critical external resources.

Risk is shown in the framework to influence strategy. Risk factors must be succinctly identified and appropriate strategies formulated to minimise the firm's exposure. Intrinsic risk factors noted for small high technology international start-ups include: the risk of financial failure stemming from the venture's newness, small size and limited resources; political, macroeconomic and foreign exchange risks as a result of their international operations; alliance and network partner opportunism and asset expropriation risks; and the risk associated with single product dependency. Furthermore, as illustrated in the framework, the risks outlined have the potential of negatively impacting the performance of the firm.

The final element in the framework is performance, which is shown to be commonly assessed and measured by the survival or failure of the firm, the operating stability or fragility of the firm, firm goal attainment, sales growth and profit expansion. The framework depicts performance as having interrelationships with organisational characteristics and strategy. Organisational characteristics and capabilities enable the firm to perform, while its performance reshapes and realigns the organisation. The formulation and implementation of appropriate strategy to a great extent determines the overall performance of the firm and the performance, favourable or unfavourable, in turn impacts subsequent strategy formulation.

CHAPTER 5

INTERNATIONAL START-UP SUCCESS FACTORS: PREVIOUS RESEARCH

INTRODUCTION

Chapter 4 provided an organising framework for international start-ups. This chapter builds on this framework and analyses extant literature on the core topic of this thesis: firm-specific determinants of success for small high technology international start-ups. The objectives of the chapter are twofold. First, a synthesis of empirical study findings identifying critical success factors applicable to small international start-ups will be compiled. Second, a framework illustrating the employment of these success factors during the firm's development process will be constructed. The chapter will largely focus on firm-specific or internal factors rather than environmental variables in order to provide high cross-sectional value by centring on factors that can be instituted internally in an effort to enhance the likelihood of success.

A wide range of studies has been conducted on success factors for small start-up firms. Much of the research centres on industry, strategy and entrepreneurial issues to explain performance (Sandberg and Hofer, 1987; Keeley, Roure, Goto and Yoshimura, 1990). While this thesis and chapter focuses on success factors for small international start-ups in high technology industries, study findings for firms in other industries will be presented due to the limited nature of extant literature. However, the preponderance of the studies highlighted involved firms in high technology industries, which appropriately biases the overall findings. Furthermore, study findings involving outside industries will be intuitively analysed in order to determine their relevance to high technology industry success factors. Recognising that each industry possesses specific success strategies (McDougall, Robinson and DeNisi, 1992; McDougall, Covin, Robinson and Herron, 1994), the chapter and

ensuing framework will focus on product and marketing strategies applicable to high technology industries. Finally, entrepreneurial issues will be addressed, since the founder/founding team is paramount to the success of virtually all start-ups. Thus, this chapter will focus on firm-specific attributes of small high technology international start-ups that have been empirically shown to lead to higher relative levels of performance.

Defining success and determining parameters for successful performance is clearly problematic. No universally accepted method for assessing successful performance exists. Ascertaining and measuring success for new ventures is even more challenging due to their lack of historical information, substantial sales variances in early years, common lack of initial profitability and their high propensity to fail. This difficulty is further exacerbated by subjective interpretation of successful performance and the introduction of the international dimension. Despite these formidable obstacles, the determination of a new venture's continuance, growth and profitability is optimal when assessing a level of successful performance. Brush and Vanderwerf's (1992) review of new venture performance estimation methods found that more than 35 different measures of performance were used, with the most common being growth in sales, changes in the number of employees and profitability. While the authors of the studies presented in this chapter have utilised a vast array of measurement techniques, thereby leading to measurement inconsistency, the findings nevertheless provide a platform enabling the correlation of firm factors to specified measures of success.

The review of literature to be presented forthwith includes success factor findings from export firm and domestic start-up studies in addition to international start-up studies. The chapter commences with an examination of empirical studies identifying the determinants of export firm success. Although a high percentage of the firms analysed in the export studies lack the requisite newness to be classed as start-ups, they nevertheless embody the internationalisation element of international start-ups, thereby providing a relevant and related perspective. This is followed by a survey of research findings on small domestic start-up critical success factors. While

domestic start-ups do not possess the internationalisation component of international start-ups, they mirror international start-ups in terms of firm age and as such add value to this analysis. Next, specific studies focusing on small international start-up success factors are reviewed. Analysing success factors from these three strands of literature will enable synergies and differences to be determined as well as provide insight into additional success factors that may be applicable to small international start-ups. Furthermore, incorporating applicable success factors derived from the widely researched export firm and domestic start-up literatures is crucial in order to develop an understanding of international start-up success factors, since extant literature is limited due to their recent emergence. A framework will then be introduced which will facilitate an understanding of key factors that should be present in small international start-ups in order to provide the highest probability of success for these inherently risky ventures. The research design for this chapter is depicted in Figure 5.1.

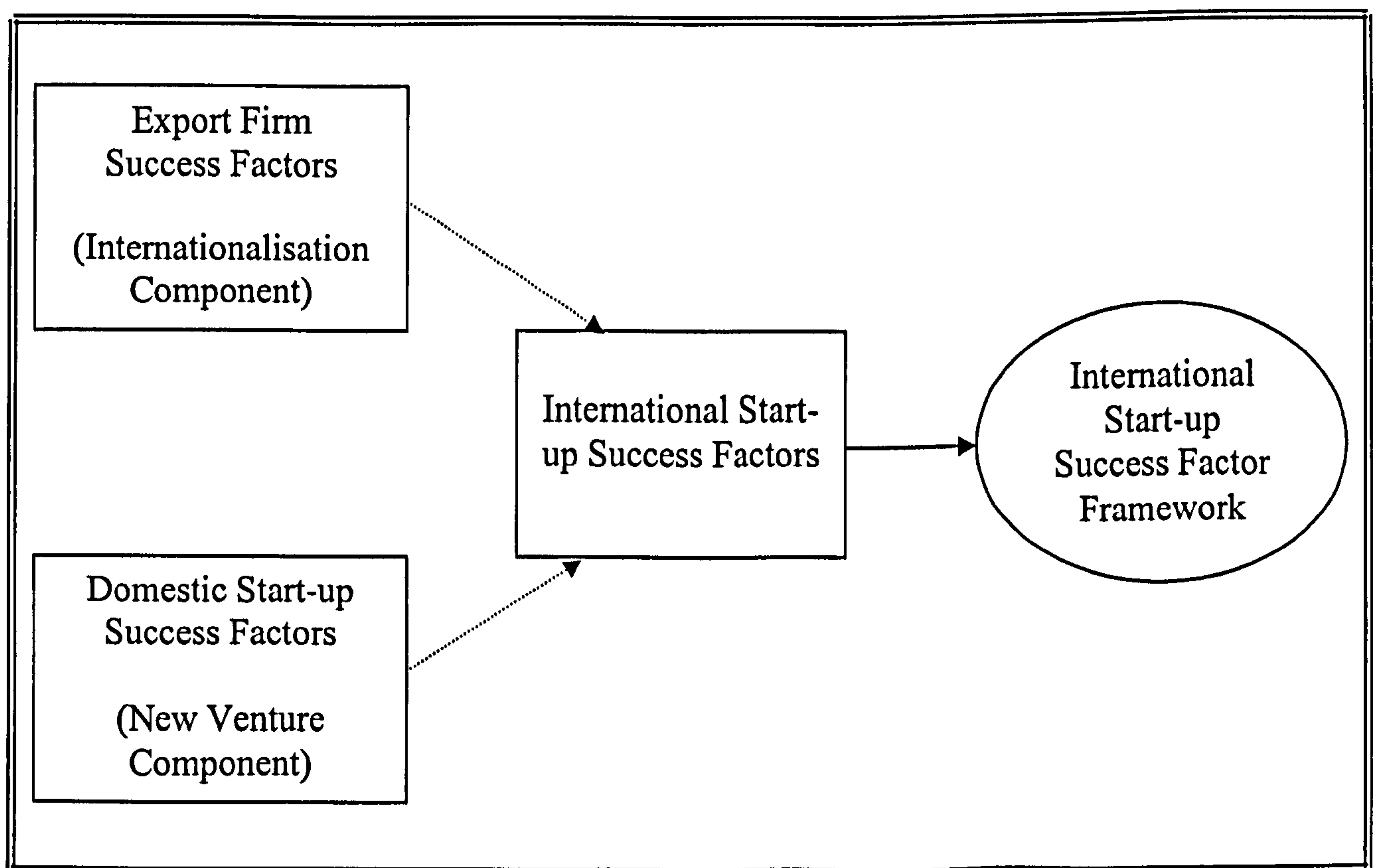


Figure 5.1: Chapter 5 Research Design

(Source: the author)

5.1 PREVIOUS RESEARCH ON EXPORT FIRM SUCCESS FACTORS

This section provides a review of the findings of empirical studies examining the determinants of higher relative levels of export performance and success. Due to the vastness of extant literature in this research area and the limited number of studies that could be illustrated in this condensed section, the selected studies include those that in turn analysed the findings of numerous other studies, so as to capture a wider range of research findings. While few of the firms incorporated in these studies could accurately be classed as new ventures, they nevertheless manifest the internationalisation element present in international start-ups and therefore enhance the analysis of international start-up success factors.

Madsen (1987) conducted a review of the findings of 17 empirical studies examining the impact of numerous independent variables on firm-level export performance. Collectively, the studies analysed data from 3,590 firms during 1963 to 1984. The firms represented a variety of industries and were primarily domiciled in North America and Europe. The performance dependent variable in the studies was generally measured by profitability, sales and growth. While noting wide-spread and consistent problems of specification error, measurement error and direction of causality ambiguity, as well as conflicting study findings, Madsen nevertheless concluded that it was possible to educe successful export guidelines from the analysis of the studies. Overall, Madsen found that the following strategy and organisational structure variables led to higher relative levels of export performance: *top management support, construction of an export knowledge base, close monitoring of export activities, focus on customer benefit, product adaptation, product strength (uniqueness, quality and service), and high levels of both channel/distributor support and technological intensity*. Although the firms in the 17 studies encompassed a wide variety of ages and sizes, the findings are nonetheless relevant to the study of international start-up success factors due to the inclusion of the internationalisation component and thus provide additional insight.

Kamath, Rosson, Patton and Brooks (1987) highlighted a study designed to determine export success factors for 29 Canadian firms that had received Canadian Export Awards in 1983 and 1984. The firms had been judged to be excellent exporters based on one or more of the following criteria: level of export sales, percentage change in export sales, export to sales ratio and success in new international product introduction. The 29 firms varied greatly in terms of size, age, industry, product, technology and markets served. The methodology consisted of open-ended in-depth interviews. Four export critical success factor generalisations emerged from the study: *quality personnel firm-wide, clear company mission, skilful strategy implementation and matching export situations and activities (i.e. market-by-market or product-by-product approach to business)*. The authors noted that these findings are consistent with those of successful firms in general, without regard to internationalisation. Despite the lack of performance measurement and linkages to performance variables, the study provides a list of consistent, albeit generic, firm attributes of successful exporters.

Aaby and Slater (1989) conducted a review of the 1978-1988 empirical literature on the managerially controllable determinants of export performance, comprising firm characteristics, competencies and strategy. The 55 studies in the review represented in excess of 9,000 firms/managers, crossed multiple industries and spanned the Americas and Europe, although heavily US weighted. Numerous performance measures were utilised in the studies, with the most prevalent dependent variables being 'propensity to export' and 'export sales'. The authors posited that while no definitive formula leading to export success existed, sufficient evidence points to a number of general axioms. They concluded that the following success factors led to higher levels of export performance: *management's export commitment, quality planning, export experience, international vision, consistent export goals, favourable perceptions towards exporting, willingness to take risks and capability to positively engage in export activities*. While drawing general conclusions from the findings of such a vast number of studies encompassing a multitude of methodologies and measures is problematic, the review nonetheless provides key insight into success factors that are intuitively applicable to international start-ups. Aaby and Slater's

findings were later broadly supported by Chetty and Hamilton's (1993) meta-analysis of 1978-1991 firm-level export performance literature and Holzmüller and Stottinger's (1996) cross-validation of export success factor models.

Cavusgil and Kirpalani (1993) performed an analysis of 130 published cases of firms that had successfully entered international markets in an effort to determine export success factors. The exporters in the study were based in North America, Europe and Japan, and spanned a wide range of sizes and industries. The study's methodology utilised 'long-term success as perceived by managers' as the dependent variable along with 16 independent variables categorised as descriptive, strategic and marketing mix variables. The approach taken in the study was to assess export success at the product level rather than the firm level. The findings indicated that different success factors existed for small and large exporters. Since the focus of this thesis is on small international start-ups, only the findings related to small firms will be illustrated. The study found that the most important determinants of small export firm success were: *top management commitment, independent distribution channels, new product diversification strategy, multiple market entry and adapting product positioning to foreign markets*. The value of the study's findings to this thesis lies in its isolation of success factors for small firms. However, the impact of the limitations outlined in the paper appears to be understated. All of the firms in the study were taken from published cases, including non-academic business publications, and are severely limited in terms of available data and the emphasis on 'success stories'. This greatly restricts the quality and reliability of the study's findings.

Styles and Ambler (1994) conducted a study of export success factors in the UK by surveying 67 winners of the 1992 Queen's Award for Export Achievement. This award recognises especially successful British exporters, as measured by a set of stringent, quantifiable criteria. The authors used this sample to benchmark successful export practices and asked each firm to indicate how important each of 26 success factors were to its success, using a five-point scale. The study found that the following success factors were the most important in terms of export performance:

consistent quality, overall company reputation, timely delivery, matching customer specifications and establishing and maintaining good relations with customers and distributors. Upon reviewing the results of the study it becomes readily apparent that the success factors identified are generally applicable to all firms. Thus, their significance to the international dimension is in question. Furthermore, the study lacks direct correlation of the success factors to specific performance measures. Despite these shortcomings, the study yields practical and relevant factors that can enhance firm performance.

Cavusgil and Zou (1994) conducted a study designed to identify determinants of successful export market performance at the individual product-market export venture level, as opposed to the firm level. Their exceptionally well-crafted methodology involved extensive interviews and statistical analysis of 202 export venture cases representing 79 US firms in 16 different industries. The sizes and ages of the firms as well as the number and location of foreign markets served varied widely. Performance was measured by analysing management's initial goal achievement and perceived success, sales growth and profitability. The study found that management has the ability to adopt several strategic options that subsequently influence export performance. Specifically, the study found that the following factors led to higher levels of export performance: *deliberate resource allocation, managerial commitment, accumulated experience, product adaptation and channel support.* Despite many of the firms in the study being older and larger with implicitly greater resources than small international start-ups, the highly detailed study nonetheless identifies key success factors that are intuitively applicable to international start-ups.

The studies illustrated in this section render a multitude of success factors that have been empirically shown to lead to higher levels of performance in export firms. A summary of the findings can be found in Table 5.1. Although drawing general population conclusions from such a limited number of studies is problematic, specific success factor consistencies emerge from the studies. Recurring success factors include management commitment, export experience, product quality,

product adaptation and a high level of channel/distributor support. While the studies in this section do not characteristically focus on new ventures, small firms or companies exhibiting high levels of international commitment, they nevertheless capture the internationalisation dimension of international start-ups, and as such provide an additional and relevant perspective.

Study	Findings
Madsen, 1987	<ul style="list-style-type: none"> • Top management support • Construction of an export knowledge base • Close monitoring of export activities • Focus on customer benefit • Product adaptation • Product strength (uniqueness, quality and service) • High level of channel/distributor support • High level of technological intensity
Kamath, Rosson, Patton and Brooks, 1987	<ul style="list-style-type: none"> • Quality personnel firm-wide • Clear company mission • Skilful strategy implementation • Matching export situations and activities (i.e. market-by-market or product-by-product approach)
Aaby and Slater, 1989	<ul style="list-style-type: none"> • Export commitment • Quality planning • Export experience • International vision • Consistent export goals • Favourable perceptions towards exporting • Willingness to take risks • Capability to positively engage in export activities
Cavusgil and Kirpalani, 1993	<ul style="list-style-type: none"> • Top management commitment • Independent distribution channels

	<ul style="list-style-type: none"> • New product diversification strategy • Multiple market entry • Adapting product positioning to foreign markets
Styles and Ambler, 1994	<ul style="list-style-type: none"> • Consistent quality • Overall company reputation • Timely delivery • Matching customer specifications • Establishing and maintaining good relations with customers and distributors
Cavusgil and Zou, 1994	<ul style="list-style-type: none"> • Deliberate resource allocation • Managerial commitment • Accumulated experience • Product adaptation • Channel support

Table 5.1: Export Firm Success Factors

(Source: the author, derived from the literature)

5.2 PREVIOUS RESEARCH ON DOMESTIC START-UP SUCCESS FACTORS

This section examines the findings of empirical studies designed to determine success factors for domestic start-ups. Although the firms in these studies lack an international dimension, they nevertheless capture the new venture characteristic of international start-ups and as such provide a related perspective yielding relevant insight into their success factors. The justification for the inclusion of these studies in this analysis of international start-up success factors is based on the limited nature of extant literature specifically pertaining to international start-up success, whereas previous research on domestic start-up success is extensive due to it being conducted over a much longer period of time.

Stuart and Abetti (1987) conducted a quantitative study involving 24 US new technical ventures in an effort to determine initial success predictors for start-up firms. The firms in the study could accurately be classed as new and small, since the mean age was 2.6 years and the mean number of employees was 7.5. The study's dependent variable, initial success, was measured by utilising both quantitative and subjective methods. Initial quantified success was measured by a combination of sales and employment growth, profitability, return on equity and sales/employee and sales/assets ratios, while subjective success was measured by a combination of attaining original expectations, probability of survival, ability to attract outside capital, employee satisfaction and contributions to society. The independent variables consisted of entrepreneur, company and market characteristics. The study found that a *high entrepreneurial level* in new ventures led to success, which is in accordance with entrepreneurship research and the view of venture capitalists. Another finding was that the founding team's relevant *previous technical and market experience* (labelled as compatibility) was strongly correlated with success. Although the small sample size warrants concern over drawing general population inferences, these findings are widely supported by later studies, which will be outlined in this section.

Goslin's (1987) study of the characteristics of successful high technology start-ups involved a mail survey of approximately 75 firms in the US's Pacific Northwest region. The firms were all less than 5 years old at the time of the study. The study's methodological decision to allow each firm to select its own success criteria clearly hampers performance analysis, particularly in light of the small sample size. While the methodology and statistical correlation outlined in the study lack detail, it nevertheless highlights the positive relationship between the founders' *previous start-up venture experience* and success.

Hofer and Sandberg's (1987) study of new venture success guidelines provided findings based on their review of literature. The authors reviewed 7 studies examining the determinants of new venture performance. The dates of the studies ranged from 1976 to 1987. The studies encompassed a wide variety of dependent

and independent variables, and utilised numerous performance measures. Pertinent success factor findings include the *domination of market segments, product differentiation, continued innovation* and being a *first mover*. First mover advantages are defined by Lieberman and Montgomery (1988) as positive economic profits earned by pioneering firms as a result of pre-empting competitors. Although Hofer and Sandberg's study does not render any new empirical evidence, it synthesises key studies and highlights four vital success factors.

Duchesneau and Gartner (1990) conducted a study of new venture success and failure profiles. Their methodology consisted of qualitative and quantitative analysis of 26 US small, young fresh juice distributors, half of which were successful and half of which were not. Removing industry variables, the study provided numerous pertinent insights. The findings indicated that successful start-ups: *seek to reduce risk, identify clear and broad business objectives, have an extensive planning process, conduct market research, seek professional advice, engage in joint ventures, are highly capitalised and pursue aggressive entry into broad markets*. The last factor noted, aggressive entry, was supported by VanderWerf's (1991) study of US and Japanese new ventures in the high-speed circuit industry. Despite Duchesneau and Gartner's small sample size and focus on a relatively limited and highly specific industry, the study provides a noteworthy contribution to the identification of critical success factors for small start-ups.

Dubini's (1990) study of new venture success assessment provides a European perspective. Though lacking detail, the methodology entailed a qualitative study of 45 European new manufacturing and service ventures over a three-year period. Successful performance was assessed by evaluating the 'consistency' of numerous success factors identified in the study. Despite its methodological brevity, the study nevertheless provides four key success factors for new ventures: *innovativeness, learning ability, willingness to grow and attention to financial aspects*. This last factor was supported by Laitinen's (1992) study of 40 Finnish industrial new ventures, which noted the correlation of survival to both *using less debt as initial financing* and *focusing on sufficient income generation*, particularly in initial stages.

Hart, Stevenson and Dial (1995) conducted a study designed to identify the relationships between founding resource decisions and new venture performance. Their methodology consisted of a grounded research approach involving in-depth case studies of 5 US new ventures crossing several industries. The firms were less than 10 years old at the time of the study. Performance was primarily measured by assessing the 'continuing access to resources' of the firms, and supplemented with traditional financial measures when available. The authors noted that founding resource choices have a significant impact on new venture survival and performance. Specifically, the study concluded that a founder's *industry-related experience*, which in turn provides *unique knowledge* and *reputation* assets, led to enhanced performance. Although the direct correlation of industry-related experience to performance is somewhat unclear in the study, it provides further evidence of new venture success factors utilising an alternative research approach.

Ostgaard and Birley (1996) performed a quantitative study of 159 English owner-managed manufacturing firms in an effort to examine the effect of personal networks on new venture growth and performance. The firms in the study were new (2 to 10 years old) and small (less than 50 employees). Growth and performance were measured by sales growth, increase in the number of employees and increase in profitability over a three-year period. Extensive multiple regression analysis confirmed the significant impact of *personal networks* on new venture performance and development. The nurturing of personal networks in order to gain access to critical resources is therefore a key success factor for small start-ups. This supports Starr and MacMillan's (1990) literature analysis finding that *social networks* provide start-ups with crucial resources and legitimacy.

Stearns (1996) administered a study designed to determine the contributions of strategic alliances to the performance of high technology new ventures. The study involved a mail survey and quantitative analysis of 225 US high technology firms representing 40 industries. The study individually analysed the performance of new, young and old high technology firms. The new firms, which were categorised as less than 6 years old, were also small, since the average number of employees was 15.

Therefore, the findings for these firms are especially relevant to the study of small international start-ups. Performance measurement was based on average annual revenue growth over a 5-year period. The findings confirmed the critical role that *strategic alliances* play in the success of high technology new ventures, particularly marketing strategic alliances. Furthermore, the utilisation of strategic alliances by high technology new ventures was found to be increasingly common and provided critical technical resources and distribution channels which facilitated success. Stearns' study supports Shan's (1990) findings of the commonality and role of *co-operative arrangements* in high technology start-up strategy and success, in the quantitative study of 278 US biotechnology start-up firms.

Finally, Bamford, Dean and McDougall (1996) conducted a study on the effects of initial founding conditions on new firm performance. Their methodology consisted of secondary data analysis of 140 US independent banks over a six-year period following formation. Performance was assessed by analysing profitability and growth, measured by ROA (return on assets) and growth in deposits. While not supplying specific success factors, the study's findings nevertheless provide significant contributions. The findings indicated that *founding conditions* and *initial decisions* have consequential and enduring effects on new venture performance, although the effects of initial founding conditions diminish over time. Additionally, the study found that an analysis of a firm's *initial resources* provided strong predictive power of growth in early years, although not for venture profitability.

Collectively, the studies in this section provide an overview of entrepreneurial, organisational, financial and product and marketing strategy characteristics that have been empirically shown to lead to higher levels of performance in start-up firms. The success factors most consistently identified in the studies were: experience, innovation, attention to financial aspects, utilising personal networks and engaging in strategic alliances and other co-operative arrangements. Table 5.2 provides a summary of the findings. Despite the lack of an international dimension, the findings provide a sound general foundation of attributes that can increase the probability of survival and growth for all new ventures, including international start-ups.

Study	Findings
Stuart and Abetti, 1987	<ul style="list-style-type: none"> • High entrepreneurial level • Previous technical and market experience
Goslin, 1987	<ul style="list-style-type: none"> • Previous start-up venture experience
Hofer and Sandberg, 1987	<ul style="list-style-type: none"> • Domination of market segments • Product differentiation • Continued innovation • Being a first mover
Duchesneau and Gartner, 1990	<ul style="list-style-type: none"> • Risk reduction • Identification of clear and broad business objectives • Extensive planning process • Conducting market research • Obtaining professional advice • Engaging in joint ventures • High level of capitalisation • Aggressive entry into broad markets
Dubini, 1990	<ul style="list-style-type: none"> • Innovativeness • Learning ability • Willingness to grow • Attention to financial aspects
Starr and MacMillan, 1990	<ul style="list-style-type: none"> • Capitalising on social networks
Shan, 1990	<ul style="list-style-type: none"> • Engaging in co-operative arrangements
Laitinen, 1992	<ul style="list-style-type: none"> • Less debt as initial financing • Focusing on sufficient income generation
Hart, Stevenson and Dial, 1995	<ul style="list-style-type: none"> • Industry-related experience • Unique knowledge • Founders' reputation
Ostgaard and Birley, 1996	<ul style="list-style-type: none"> • Utilising personal networks

Table 5.2: Domestic Start-up Success Factors

(Source: the author, derived from the literature)

5.3 PREVIOUS RESEARCH ON INTERNATIONAL START-UP SUCCESS FACTORS

Chapter 4 described international start-ups as a relatively new phenomenon. Due to their recent genesis and emergence, few studies of this business entity have been conducted, and fewer still on their success factors. However, a limited number of studies designed to determine success factors for international start-ups exist. These studies encompass a variety of variables and methodologies. This section highlights the findings of extant research and literature on this exploratory subject and provides the foundation for the development of the small high technology international start-up success factor framework formulated in Section 5.4.

Lindqvist (1990) conducted a study to determine critical success factors during the early internationalisation process of small high technology firms. The methodology included 15 interviews and the analysis of 95 mail surveys of small, young, independent, export-oriented, Swedish firms in high technology industries. These characteristics coupled with the study's high export intensity requirement (over 20% of turnover attributable to foreign exports) closely mirror the characteristics of international start-ups and the findings are therefore highly relevant. The four performance measures utilised in the study were: export intensity, perceived profitability of foreign activities and absolute and relative growth in export sales over a 5-year period. Bivariate and multivariate analysis produced largely mixed and inconclusive results. However, the following factors exhibited a clear correlation with success: 1) *international vision*, manifested firm-wide; 2) *foreign commitment*, as demonstrated by the willingness to invest required resources for foreign operations; 3) *unique products*, displaying technological leadership and providing the possibility of charging high margins; and 4) *continuous innovation*, minimising

reliance on the initial product by making ongoing investments in new product development.

Support for Lindqvist's foreign commitment success factor finding was given the same year in Tyebjee's (1990) study of the internationalisation of high technology ventures. The study involved quantitative analysis of 105 mostly small, young, independent US internationalised high technology ventures spanning 8 industries. A substantial percentage of the firms in the study employed foreign market entry modes other than direct exporting and conducted value chain activities in foreign locales, thereby exhibiting key characteristics of international start-ups. The study found that time spent *planning and managing foreign markets* and a *product adaptation* strategy were significantly correlated with internationalisation success.

Jolly, Alahuhta and Jeannet's (1992) study of winning global strategies for high technology start-ups yielded findings tantamount to critical success factors for international start-ups. The methodology consisted of four in-depth, longitudinal case studies of high technology start-ups that displayed the defining characteristics of international start-ups. Each of the start-ups competed in international markets from the beginning and co-ordinated many value chain activities across geographically dispersed nations. Seven global strategy elements leading to success, or critical success factors, emerged from the case studies. The authors contend that a winning strategy for international start-ups necessitates the harmonious implementation of all seven elements. The success factors noted in the study were:

- *Global vision* of the founders from the onset, permeating the entire company, with organisational resources deployed world-wide.
- *High-quality innovative product* that *rides on an industry change or shift*, thereby allowing easier entry, with the intent of establishing an early niche in a growing market.
- *Standardised products*, requiring minimal adaptation and targeting homogeneous world-wide segments due to start-up firm resource constraints, coupled with *lead market success*, or early success in key international

markets in order to pre-empt competitors and serve as a learning experience for other world markets.

- *Broad and rapid market access*, quickly spreading throughout large markets so as to generate crucial revenue to offset high fixed costs, often achieved through the *utilisation of strategic alliances*, to include original equipment manufacturing (OEM) arrangements.
- *Selective, functionally specialised international investments*, swiftly building a widely dispersed global business system in order to gain market access, facilitate sourcing and avoid alliance dependence.
- *Follow-on products*, given early emphasis so as to avoid single product dependence in a rapidly changing industry environment, thereby widening the company's *breadth of competence*.
- *Tightly networked global organisation*, managed and co-ordinated as a single global entity.

Although Jolly, Alahuhta and Jeannet's (1992) study involves only four firms, it nevertheless provides highly insightful and relevant findings leading towards the succinct identification of international start-up success factors. Furthermore, it supports all four findings of Lindqvist's (1990) study. Jolly et al.'s global vision supports Lindqvist's international vision, selective international investments supports foreign commitment, innovative products supports unique products and follow-on products supports continuous innovation. The convergence of the two studies' findings suggests a strong relationship between these factors and international start-up success.

Rennie (1993), as part of a joint research project between McKinsey & Company and the Australian Manufacturing Council, conducted a study on 'born global' small to medium-sized (SME) exporting firms. The methodology involved focus groups, in-depth interviews and a detailed survey of over 300 Australian high-value-added manufacturing exporters. The study noted the rise of SME born global exporters who successfully competed virtually from their inception with larger companies engaged in international trade. These companies exhibited an international focus

rather than a domestic orientation, as evidenced by exports representing 76% of their total sales. The study found that the success factors for these born global exporters were: *innovative technology, quality products, niche markets, flexibility and fast response*. Since the firms in the study could generally be classed as international start-ups, the findings are highly relevant to the analysis of international start-up success factors. Furthermore, the success factors identified in this study support the findings of Jolly et al. (1992), thereby providing additional substantiation of their importance. Rennie's niche market and quality products findings were later supported by Knight, Madsen, Servais and Rasmussen (2000), who found in their case and quantitative study of American and Danish 'born globals' that *focus* (i.e. a niche market strategy), *marketing competence* and to a lesser extent *product quality* and *product differentiation* were key factors in the international success of these firms.

Oviatt and McDougall (1995) conducted a highly insightful study of the characteristics of successful international start-ups. 12 small, primarily high technology US and European international start-ups were examined in order to determine critical success factors associated with their survival and growth. The methodology included an extensive series of interviews coupled with a review of secondary data for each firm. The findings were derived from a correlation of the level of presence of seven success characteristics to the survival or failure of each firm. The success factors identified were:

- *Global vision* of the founders and their instilling of a global mindset throughout their organisations.
- *Internationally experienced managers* who have a sound understanding of the mechanics of international business as well as an appreciation for cultural differences that are encountered.
- *Strong international business and social networks*, leveraging relationships and forming networks of alliances in order to compensate for resource deficiencies.

- *Pre-emptive technology or marketing*, being a first mover with a unique product or service in lead markets.
- *Unique intangible asset* presence, such as *unique knowledge*, coupled with *continual innovation* in order to attain sustainable competitive advantage.
- *Linked product or service extensions*, developing related products/services to the initial innovation, such as adapting the technology to other products, consulting or selling supplies for the firm's products.
- *Closely co-ordinated world-wide organisation*, whose value chain activities are geographically dispersed, facilitated in part by a *sophisticated communications infrastructure*.

Oviatt and McDougall's study found that successful international start-ups possessed a higher level of presence of these seven success characteristics. Furthermore, the first three success factors listed were found to be the most highly correlated to success, with global vision being the most important. The study provides broad support for the earlier findings of Lindqvist (1990), Jolly et al. (1992) and Rennie (1993). While the study lacks quantitative support, involves only 12 companies and measures success solely on survival, it nevertheless focuses specifically on international start-ups and as such represents highly significant and relevant research into their success factors.

Several studies support Oviatt and McDougall's success factor findings. For example, Coviello and Munro (1992, 1995, 1997) found that network relationships facilitated successful international growth for international new ventures in their case studies of four small, young, New Zealand software firms. Hara and Kanai (1994) found that social and business networks led to successful international strategic alliances between small firms, often through the efforts of an intermediary, in their case study of an alliance between a Japanese firm and three American firms. Finally, Reuber and Fischer (1997) found that internationally experienced managers led to both a higher degree of internationalisation and a higher propensity to engage in co-operative agreements and foreign business networks in their quantitative study of 49 small, internationalised, Canadian software firms.

Bloodgood, Sapienza and Almeida (1995, 1996; Almeida and Bloodgood, 1996) conducted a study of the internationalisation and performance of 61 US new high potential ventures, crossing numerous industries. The SME firms in this quantitative study were noted to have similar characteristics to international new ventures, as defined by Oviatt and McDougall (1994). The study found that new venture initial conditions were significantly associated with performance, as measured by sales growth and income, two years following their formation. *Low cost and product differentiation strategies* and *larger initial size* were found to have significant positive relationships to sales growth, while *innovation* was marginally significant. Drawing general conclusions for international start-ups based on this study is problematic. While the findings enhance the critical success factor identification process, the value is limited due to the cross-industry approach taken, since each industry has its own appropriate success strategy.

Finally, Roberts and Senturia (1996) performed a qualitative study involving in-depth interviews of 19 small, independent, US desktop computing companies with the intent of explaining their very rapid globalisation patterns, as well as ascertaining their success factors. Most of the firms conducted international transactions spanning multiple continents within two years of domestic product release, thereby approximating the defining characteristics of international start-ups. Performance was assessed by analysing non-domestic revenues. The study identified the following key success factors: *founder international experiences*, *founder international predisposition*, *international resource commitment* and *aggressive foreign market entry*. These critical success factor findings further support the earlier findings of the studies previously delineated.

The studies outlined in this section identify highly pertinent and specific success factors for international start-ups. The firms in the studies were largely small, independent and operated in high technology industries, which as discussed in Chapter 4 are common characteristics of international start-ups. Thus, the success factor findings are more applicable to these types of firms, which is optimal since this thesis focuses on small high technology international start-ups, thereby providing

tacit applicability. Consistently identified success factors include an international/global vision firm-wide, foreign commitment, unique and innovative products and continuous innovation. A summary of the findings can be found in Table 5.3. While the findings are insightful, much empirical work remains on this exploratory topic. Additional qualitative and extensive quantitative research on international start-ups is clearly warranted and necessary in order to gain clearer knowledge of this crucial aspect that is linked to their survival and growth. This research project will fill this gap by building on the limited existing research and providing substantive qualitative and quantitative findings based on international start-ups spanning two continents.

Study	Findings
Lindqvist, 1990	<ul style="list-style-type: none"> • International vision firm-wide • Foreign commitment • Unique products • Continuous innovation
Tyebjee, 1990	<ul style="list-style-type: none"> • Extensive planning and managing of foreign markets • Product adaptation
Jolly, Alahuhta and Jeannet, 1992	<ul style="list-style-type: none"> • Global vision firm-wide • High-quality innovative products that ride on an industry change or shift • Standardised products • Lead market success • Broad and rapid market access • Utilisation of strategic alliances • Selective, functionally specialised international investments • Follow-on products • Wide breadth of competence • Tightly networked global organisation
Rennie, 1993	<ul style="list-style-type: none"> • Innovative technology • Quality products • Niche markets

	<ul style="list-style-type: none"> • Flexibility • Fast response
Oviatt and McDougall, 1995	<ul style="list-style-type: none"> • Global vision and mindset throughout the firm • Internationally experienced managers • Strong international business and social networks • Pre-emptive technology or marketing • Unique intangible asset, such as unique knowledge • Continual innovation • Linked product or service extensions • Closely co-ordinated world-wide organisation • Sophisticated communications infrastructure
Bloodgood, Sapienza and Almeida, 1995, 1996	<ul style="list-style-type: none"> • Low cost / product differentiation strategies • Larger initial size • Innovation
Roberts and Senturia, 1996	<ul style="list-style-type: none"> • Founder international experiences • Founder international predisposition • International resource commitment • Aggressive foreign market entry
Knight, Madsen, Servais and Rasmussen, 2000	<ul style="list-style-type: none"> • Focus (i.e. a niche market strategy) • Marketing competence • Quality products • Product differentiation

Table 5.3: International Start-up Success Factors

(Source: the author, derived from the literature)

5.4 ANALYSIS OF SUCCESS FACTORS

Analysis of the export firm, domestic start-up and international start-up success factors leads to the conclusion that synergies and consistencies abound, despite varying study methodologies and samples (e.g. sectors). Few differences exist once the impact of the international versus domestic and the start-up versus mature firm

dimensions are considered. Export firms, domestic start-ups and international start-ups have similar success determinants in terms of founder, organisation, product, marketing strategy and financial characteristics. However, it is imperative to recognise that the success factors identified are largely applicable to all firms, since they provide sound, practical, general business advice. Thus, in order to isolate success factors directly applicable to international start-ups, it is crucial to capture their defining characteristics in terms of age, size and degree of internationalisation. This analysis along with the ensuing conceptual framework presented in Section 5.5 will focus on success factors that are directly applicable to small high technology international start-ups in order to facilitate an understanding of the variables directly associated with superior performance, as measured by continuance, growth and profitability.

As indicated, the entire lists of both export firm and domestic start-up success factors are generally applicable to international start-ups. The key differences are the introduction of the new venture and internationalisation contexts, with international start-ups exhibiting internationalisation at or near inception, competing in international industries and employing appropriate underlying strategies. McDougall's (1989) study of international and domestic entrepreneurship found that the strategy and industry structure of international new ventures was vastly different from that of domestic new ventures. International new ventures were found to pursue much broader market-based strategies and displayed more aggressive entry strategies. Furthermore, market awareness, channel control and penetration played a more integral strategic role. Thus, while domestic start-up success factors provide a sound foundation for international start-up success characteristics, recognition of international industries and associated strategic idiosyncrasies is paramount to the compilation of applicable success attributes.

Before commencing with an analysis of the three sets of success factors, it is paramount to recognise the impact of an overriding limitation. Due to the limited nature of extant literature regarding international start-up success factors as well as the limited number of export firm and domestic start-up studies illustrated, the lists

are not comprehensive. The restricted scale of this review of literature led to the identification of a limited number of success factors. Whereas key, insightful studies in the three strands of literature were illustrated, other success factors exist. The recognition of this limitation was the basis for the delineation of the three sets of success factors to describe applicable attributes for international start-ups. The implication is that had extant literature on international start-ups been more extensive, it would have included many of the success factors noted in the other two literatures, which are greater developed as a result of longer periods of empirical research.

Table 5.4 provides the foundation for a cross analysis of the three sets of success factors. The most consistently identified and significant success characteristics within each set of study findings are categorised under the corresponding subheadings of founder, organisation and product and marketing strategy, and are delineated in the far-left column. The empirical identification of the various success factors in the outlined export firm, domestic start-up and international start-up studies is noted with an 'X'. The table allows for complementarities as well as differences to be discerned.

	Export Firm Success Factors	Domestic Start-up Success Factors	International Start-up Success Factors
Founder:			
International/Global Vision	X		X
Foreign Commitment	X		X
Managerial Experience	X	X	X
Planning/Managing Markets	X	X	X
Attention to Financial Aspects		X	
Business/Social Networks		X	X
Organisation:			
Close/Tight Co-ordination	X		X
Channel/Distributor Support	X		
Strategic Alliances/ Co-operative Ventures		X	X
Product and Marketing Strategy:			
Quality/Unique/Innovative Products	X	X	X
Continuous Innovation	X	X	X
Niche Markets			X
Aggressive Market Entry	X	X	X
First Mover		X	X

Table 5.4: Success Factor Complementarities and Divergences

(Source: the author, derived from the literature)

Reviewing Table 5.4 leads to piquant, albeit limited, conclusions. All three sets of success factor findings recognised the importance of management's experience, extensive planning and managing of markets, having products that are high quality, unique and innovative, continuous innovation and aggressive market entry. The

convergence of these five factors is indicative of their significance to the success of international start-ups. Firm-wide international/global vision, foreign commitment and the close co-ordination of a firm's world-wide organisation were found to be crucial for both export firms and international start-ups. The convergence is clearly logical since both entities conduct international operations involving geographic asset dispersion. The presence of these three factors in both sets reinforces their significant role in international start-up success. The absence of these factors in the domestic start-up success factor findings is obviously due to their lack of international orientation. The possession and utilisation of business and social networks, engaging in strategic alliances and other co-operative ventures and employing a first mover strategy were found to lead to success in both domestic start-ups and international start-ups. The presence of the first two factors in both sets is due to the newness of these firms and their frequent small size, requiring networks and alliances to compensate for resource deficiencies, which supports the principles of network theory. Being a first mover, or having a pre-emptive technology or marketing strategy, could be inferred as a necessary strategic component for small start-up firms that lack the requisite resources to directly compete with larger companies in established product-markets. The presence of these three success factors in both sets of literature provides additional support for their relevance to the success of international start-ups. The absence of these factors in the export firm literature can be attributed to their implicit advanced maturity, larger size and greater resources negating their necessity to rely on networks, alliances and first mover strategies.

Three final success factors require analysis. Attention to financial aspects and channel/distributor support were noted solely in the domestic start-up success factor studies. However, these two factors are intuitively applicable to export firms and international start-ups as well. Their absence can be attributed to the small-scale limitation previously stated. They represent sound, universal business advice for all firms, and as such are deemed to be success factors for international start-ups. The final success factor, operating in niche markets, was only found in the international start-up literature. The importance of operating in niche markets for international

start-ups is due to their limited resources to compete internationally with larger, established firms. The implication is that mature export firms have greater resources, enabling direct competition in established markets, while domestic start-ups are not confronted with the additional resource requirements associated with international competition, thus limiting their necessity to operate in niche markets.

Two divergences exist in the three success factor literatures, pertaining to product adaptation versus standardisation and low cost versus product differentiation strategies. The literature on international start-ups identifies all four as success factors (as well as product adaptation for export firms and product differentiation for domestic start-ups). Strategic management principles dictate that a firm must choose between product adaptation and standardisation, as well as between a low cost and product differentiation strategy as a means of competitive advantage. The paradoxical findings can be readily explained. Each industry/sector/product has its unique success strategies. The conflicting strategies in the literature are a result of study findings in different industries and sectors. Since this thesis and chapter focuses on small high technology international start-ups, product and marketing strategies directly applicable to these entities will be highlighted.

5.5 FRAMEWORK DEVELOPMENT

Recognising the contribution and applicability of the noted export firm and domestic start-up success factors, a holistic approach was taken in the construction of a comprehensive framework depicting critical success factors for small high technology international start-ups (see Figure 5.2). While the specific success factor findings for international start-ups were given the greatest weighting, intuitively applicable success factors from the other two literatures were included in the framework, consistent with the small-scale limitation previously addressed. The framework focuses on 'small' international start-ups for three reasons. First, as pointed out in Chapter 4, international start-ups are generally small-sized. Second, most of the firms in the international start-up studies involved small firms, with the

weighting of this literature in the framework development leading to a bias towards these firms. And third, it is congruent with the size of the firms in this research project, thereby providing applicable and possible independent success factor variables for the quantitative research phase. Similarly, the framework concentrates on factors applicable to firms in high technology industries for the same three reasons. International start-ups are often high technology oriented, many of the firms in the highlighted studies were involved in high technology industries and the research phases of this thesis focus on high technology/knowledge-intensive industries. Finally, the framework is biased towards 'independent' international start-ups as opposed to company sponsored start-ups for the same three reasons. Thus, the framework illustrates critical success factors for small, independent, high technology international start-ups.

One additional framework facet requires clarification. In light of the discussion in the previous section regarding strategy related to product adaptation/standardisation and low cost/product differentiation and their industry/sector/product specificity, inclusions applicable to small high technology international start-ups were made in the framework. The framework identifies standardised products with minimal adaptation and differentiated products allowing premium pricing as success factors. Justification for the inclusion is based on the framework's focus on 'small' and 'high technology' international start-ups. Small new ventures commonly lack the resources required for both extensive product adaptation and competing on price, which generally requires economies of scale. Thus, resource constraints typically predispose small international start-ups to employ standardised and differentiated product strategies. The additional expenses associated with innovation in high technology industries further exacerbates the resource constraints associated with being small and new, leading these firms to likewise employ product standardisation and differentiation strategies.

The framework is comprised of founder, organisation and strategy success factors situated along a time horizon, facilitating a sequential perspective. Founder factors represent characteristics of the founder or founding team that have been empirically

shown to lead to higher levels of performance. They include an international mindset and commitment, experience, planning, network utilisation and attention to financial aspects. Organisation factors encompass organisational attributes leading to success, such as high quality and internationally experienced managers, unique knowledge, employment of strategic alliances, co-ordination of globally dispersed resources and flexible and swift response capabilities. Finally, strategy components relate to product and marketing strategy, for example innovative products, continuous innovation, operating in niche markets, pre-emptive technology or marketing, broad and rapid market access and lead market success.

The framework's founder, organisation and strategy success factors are divided into three time phases. The first phase is the formation process, entailing conceptualisation and planning, whereby the founder(s) recognise an international opportunity, conceptualise a firm, obtain key resources, develop a unique organisation and determine its competitive advantage. The second phase is the commencement of operations, encompassing the implementation of the organisational plan, participation in strategic alliances, making selective international investments, tightly networking the ensuing international organisation and launching the product and marketing strategy. The third phase delineates success factors that are crucial in the initial or early years of the firm, such as swift response to industry or competitive changes, follow-on products and engaging in linked product or service extensions in order to enhance firm revenue.

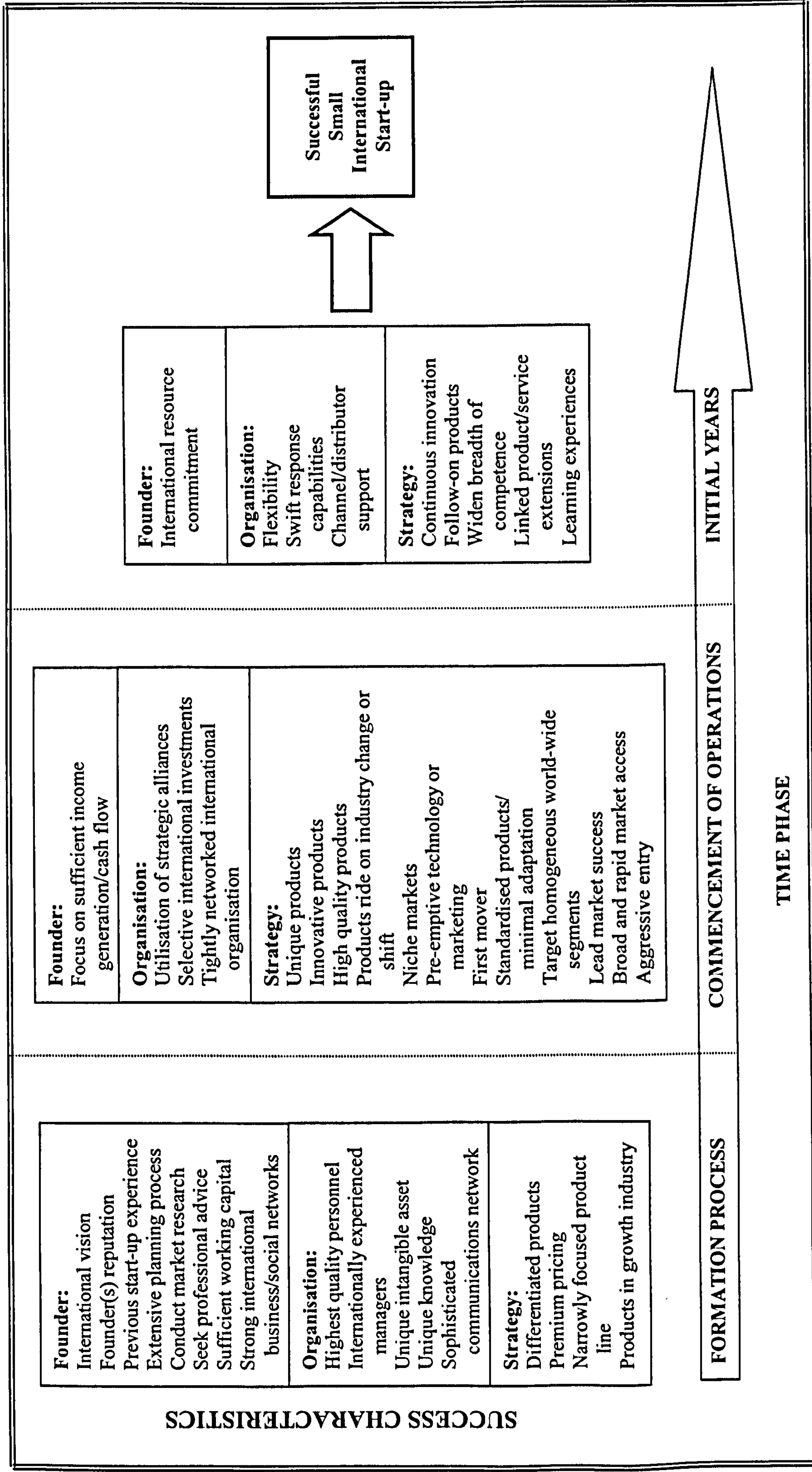


Figure 5.2: Success Factor Framework for Small High Technology International Start-ups

5.6 CONCLUSIONS

The framework developed in this chapter provides a holistic summary of critical success factors for small high technology international start-ups. While a multitude of factors were identified, some are especially correlated with successful performance, based on the consistency of the study findings and the particular significance noted by the various researchers. These key success factors include: the international vision of the founders, the international commitment of the founders and top management team, having internationally experienced and culturally aware managers, having strong international business networks, continuous innovation and competing in niche markets with products that are unique, innovative and of high quality.

The methodological approach taken in the construction of the framework necessitates the outlining of several limitations. First, as discussed throughout the chapter, the restricted scale of the review of literature equates to somewhat limited findings. Second, it must be clearly understood that while the success factors illustrated in the framework are empirically based, the framework does not represent a prescribed formula for success, nor are all the listed factors universally applicable. It delineates general guidelines and acknowledges that each international start-up possesses decisively unique variables, which alter its key success factors. Third, the framework broadly focuses on high technology industries, requiring a firm to analyse the ramifications of its particular sector/product and its appropriate underlying success strategies. And fourth, the framework takes an international perspective and crosses study findings from nations throughout the world, although primarily North American and European, thus necessitating a consideration of the impact of cultural variances on the stated success factors. It should be noted that no literature could be located that provided a direct comparison of success factors for UK and US international start-ups.

Knight and Cavusgil (1996) proposed that a success factor model be constructed and empirically tested with international start-ups spanning the world. The framework

illustrated in this chapter provides a starting point for such a study and will serve as a foundation for the research phases of this thesis. The critical success factors identified in the framework will constitute independent variables to be explored in the qualitative research phase and tested in the quantitative phase. While the findings are insightful, much empirical work remains on this exploratory topic. This thesis will fill this gap by building on the limited existing research and providing substantive qualitative and quantitative findings based on international start-ups spanning two continents.

CHAPTER 6

RESEARCH METHODOLOGY

INTRODUCTION

The preceding chapters provided a review of pertinent literature regarding both internationalisation theory and previous research related to the study's research objectives, with emphasis on the primary objective of identifying success factors for small high technology international start-ups. This chapter builds on the literature review and its frameworks by analysing and developing an appropriate research design so as to achieve the study's objectives and specifically address the research questions. The selection of the most optimal research design amongst the alternatives can be likened to the development of a blueprint of the collective research process whereby each sequential step is formulated and delineated, ultimately leading to the successful accomplishment of the study's objectives (Churchill, 1987; Chisnall, 1997; Aaker, Kumar and Day, 1998).

The chapter commences with a restatement of the study's research objectives and questions, and the delineation of the study's research propositions. This is followed by a review of research design alternatives and approaches as well as the description of common data collection methods. Then, the adopted research design and process are described, along with the rationale for the selection. This is followed by a description of the population definition and sampling frame. Next, the details of the qualitative phase of the research are outlined. Finally, the quantitative phase of the research is described, including details regarding the construction of the questionnaire and the administering of the postal survey.

6.1 RESEARCH OBJECTIVES, QUESTIONS AND PROPOSITIONS

Chapter 4 provided evidence of the existence and emergence of international start-ups. As was discussed in the chapter, academic knowledge of this emerging class of new ventures is severely limited due in part to their recent advent on the world stage. This research project set out to enhance academic knowledge of international start-ups in general as well as to specifically address crucial gaps in the literature. These gaps constitute the basis for the study's research objectives. The primary research objective was to *identify firm-specific success factors for small high technology international start-ups* in order to understand what specific founder, organisation and product and marketing strategy characteristics are correlated with higher relative levels of performance. The secondary objective, albeit still of paramount importance, was to *identify factors influencing their markedly early internationalisation*, so as to understand why small high technology start-ups are increasingly international in nature at or near inception. Two final tertiary objectives were to *identify factors influencing both the selection of their initial country markets and their frequent early establishment of foreign-based organisational activities* in order to gain an understanding of these key dimensions. The study focused on small high technology international start-ups (as defined in Chapter 2) in the UK and US since international start-ups are commonly small in size, frequently operate in high technology industry sectors and are able to be identified in sufficient quantity to conduct the research in the UK and US. The study's research questions, which are framed around its objectives, are restated below.

Research Question 1

- a) *Which founder, organisation and product and marketing strategy characteristics of small high technology international start-ups are significantly correlated with performance?*
- b) *Which of these characteristics are the best predictors of performance for small high technology international start-ups?*
- c) *What differences exist, if any, between these findings for UK and US international start-ups?*

Research Question 2

- a) *What are the key factors influencing small high technology start-ups to be international at or near inception?*
- b) *What differences exist, if any, between these factors for UK and US start-ups?*

Research Question 3

- a) *What are the principal factors influencing the selection of initial country markets for UK and US small high technology international start-ups?*
- b) *What differences exist, if any, between these factors for UK and US international start-ups?*

Research Question 4

What are the primary factors influencing small high technology international start-ups to establish organisational activities (e.g. sales or service offices) in foreign countries in the early years of their existence?

Briefly summarising the literature, Chapters 4 and 5 provided a review of extant literature regarding international start-ups, with an emphasis on previous research related to the four stated research questions. Chapter 4 highlighted relevant internationalisation theory as well as prior empirical study findings regarding several dimensions of international start-ups, including those related to Research Questions 2-4. Accordingly, a detailed analysis of factors influencing the formation of international start-ups was incorporated in this review (see Section 4.4), along with findings pertaining to factors influencing both their selection of initial country markets and their early establishment of foreign-based organisational activities. An organising framework illustrating these dimensions was presented in Figure 4.3. Chapter 5 focused on previous research related to international start-up success factors, so as to address Research Question 1. The ensuing success factor framework for small high technology international start-ups was presented in Figure 5.2.

The study's research propositions, which are directly linked to the research questions, are derived from the recurrent findings of both prior empirical studies, as

outlined in Chapters 4 and 5, and this study's exploratory interviews, which are presented in Chapter 7. Whereas sufficient, albeit limited, literature existed to construct Research Propositions 1 and 2, extant literature regarding the final two propositions as applied directly to international start-ups was inadequate. Therefore, the development of Propositions 3 and 4 was largely based on this study's qualitative findings. The four propositions and key supporting literature are listed in Table 6.1.

Proposition 1: That the founder, organisation and product and marketing strategy characteristics of small high technology international start-ups which are both significantly correlated with performance and the best predictors of performance are:

- a) the founders' international vision, international commitment and strong international business and social networks
- b) the organisation's internationally experienced managers
- c) the product and marketing strategies of continuous innovation, operating in niche markets world-wide and having products that are unique, innovative and of high quality.

Key Literature: Lindqvist, 1990; Jolly, Alahuhta and Jeannet, 1992; Rennie, 1993; Oviatt and McDougall, 1995; Bloodgood, Sapienza and Almeida, 1995, 1996; Roberts and Senturia, 1996.

Proposition 2: That the key factors influencing small high technology start-ups to be international at or near inception are the founders' previous international experience and the international and competitive nature of the firms' industry.

Key Literature: Coviello and Munro, 1995; McDougall, 1995; Roberts and Senturia, 1996; Madsen and Servais, 1997.

Proposition 3: That the principal factors influencing the selection of initial country markets for small high technology international start-ups are the assessments of being large and leading industry markets.

Key Literature: Jolly, Alahuhta and Jeannet, 1992; Bell, 1995; Oviatt and McDougall, 1995; Lindqvist, 1997; current study's qualitative findings.

Proposition 4: That the primary factors influencing small high technology international start-ups to establish organisational activities in foreign countries during the early years of their existence are the establishment of a local presence in key industry markets and the provision of enhanced regional sales and service support.

Key Literature: Litvak, 1990; Lindqvist, 1997; current study's qualitative findings.

Table 6.1: Propositions and Key Literature

6.2 RESEARCH DESIGN ISSUES

The formulation of the most appropriate research design involves an analysis of alternative designs in relation to the study's objectives, while considering resource constraints (Churchill, 1987). A wide range of research designs, approaches and instruments exist. This section briefly reviews each of the key alternatives in order to provide the background for the development of the adopted research design. The research design and instruments chosen in this research project are delineated in Section 6.3.

Research designs can be broadly classified as being exploratory, descriptive or causal in nature, or any combination of the three (Churchill, 1987). If little is known about a particular research interest and extant literature is limited or non-existent, the research is best described as exploratory in nature and an exploratory research design is appropriate (Hartman and Hedblom, 1979). The primary objective of exploratory research is to discover new ideas and insights and it is commonly employed in new and emerging research areas (Kinnear and Taylor, 1991; Chisnall, 1997; Aaker et al., 1998). If more is known about a research topic and the purpose of the research is to describe characteristics, determine frequencies or make predictions, a descriptive research design is appropriate (Churchill, 1987; Chisnall, 1997). Finally, if knowledge exists about a research topic and it concerns cause and effect relationships, often involving experimentation, a causal research design is appropriate (Hartman et al., 1979; Chisnall, 1997).

Another critical research design issue is the appropriate selection of qualitative versus quantitative techniques. Table 6.2 illustrates the philosophical perspectives behind these two techniques by presenting the tenets of the positivist paradigm and associated quantitative methods versus the phenomenological paradigm and associated qualitative methods. Easterby-Smith, Thorpe and Lowe (1991) argue that although the positivist and phenomenological paradigms offer opposing perspectives, a mix of qualitative and quantitative methods is often appropriate since it provides richer insights. The remainder of this section involves a more in-depth examination

of qualitative and quantitative data and techniques, addresses strengths and weaknesses and discusses commonly employed data collection instruments for each technique.

	Positivist Paradigm	Phenomenological Paradigm
Basic beliefs:	The world is external and objective Observer is independent Science is value-free	The world is socially constructed and subjective Observer is part of what is observed Science is driven by human interests
Researcher should:	focus on facts look for causality and fundamental laws reduce phenomena to simplest elements formulate hypotheses and then test them	focus on meanings try to understand what is happening look at the totality of each situation develop ideas through induction from data
Preferred methods include:	operationalising concepts so that they can be measured taking large samples	using multiple methods to establish different views of phenomena small samples investigated in depth or over time

Table 6.2: Positivist vs. Phenomenological Paradigms

(Source: Easterby-Smith, Thorpe and Lowe, 1991, p27)

Qualitative techniques seek to describe and interpret the meaning, rather than the frequency, of a phenomenon (Van Maanen, 1983). They produce non-quantified and non-statistical findings designed to discover and understand the essence of little known phenomena (Strauss and Corbin, 1990). Qualitative methods provide a rich representation of phenomena by uncovering explanatory and influential factors (Chisnall, 1997), which is useful when the objectives involve traditional preliminary exploration and screening and exploring complex behaviour (Hart, 1987). On the other hand, qualitative data is subject to interpretation and thus lacks analytical

method uniformity (Miles and Huberman, 1994) as well as objectivity (Hart, 1987). Furthermore, the collection of qualitative data is highly time intensive and its credibility is widely challenged, particularly amongst policy-makers (Easterby-Smith et al., 1991).

Quantitative techniques involve the collection and analysis of quantifiable data. Quantitative methods are appropriate for hypothesis testing, synthesising large numbers of variables in order to determine associations and controlling for generalisability (Hart, 1987). Hart (1987) contends that the strength of quantitative methods is its comparability, assuming common methodologies employed, due to its utilisation of standardised numerical format, which reduces bias associated with subjective interpretation. Furthermore, it is faster and more economical than qualitative methods and its allowance for large samples facilitates generalisability (Easterby-Smith et al., 1991). However, its weaknesses include its inflexibility and its inability to provide rich understandings of processes and perspectives (Easterby-Smith et al., 1991).

Several data collection instruments are available for both qualitative and quantitative techniques. The two most common qualitative collection instruments are observation and interviews. Observation involves observing the research phenomena by watching the behaviour of individuals or by analysing recorded data (Chisnall, 1997). Interviews, specifically face-to-face personal interviews, represent a commonly employed qualitative technique that allow interaction between the interviewer and interviewee, thereby enabling responses to be probed, questions to be explained and new dimensions to be explored. However, the interaction can lead to response bias (Kinnear et al., 1991) and the process requires that the interviewer be highly skilled in interviewing techniques in order to achieve maximum potential (Crimp, 1990; Chisnall, 1997). Personal interviews can be structured, unstructured or depth, depending upon the research objectives (Hart, 1987; Baker, 1991).

The most common data collection instrument for quantitative techniques is the mail survey. Although other options exist, such as telephone and computer surveys, the

mail survey is a highly popular quantitative data collection method (Cavusgil and Elvey-Kirk, 1998). Mail surveys or questionnaires represent the most appropriate data collection instrument when a substantial amount of data need to be recorded through structured questions from large geographically dispersed samples at a minimal cost (Tull and Hawkins, 1993). However, mail surveys have several inherent shortcomings. The questions are subject to misinterpretation since clarifications are not possible due to the absence of interaction between the researcher and respondent. Furthermore, problems associated with non-response and response error are commonplace, although steps can be taken to minimise their effects (Kinnear et al., 1991; Delener, 1995; Chisnall, 1997). Still another obstacle is the complexity involved with implementing international surveys. Specific measures taken to reduce the magnitude of these problems will be discussed later in the chapter.

6.3 ADOPTED RESEARCH DESIGN AND PROCESS

The previous section provided a brief overview of research design issues and approaches. This section builds on this framework by describing the selected research design for this thesis study. Based on the research objectives stated in Section 6.1, the limited nature of extant literature as outlined in Chapters 4 and 5 and in recognition of the advantages and disadvantages of the various research design alternatives presented in Section 6.2, the researcher concluded that a combination of research design methods was the most appropriate methodology for this research study. Although the study can fundamentally be classified as being exploratory in nature, it has elements of descriptive and causal design as well and requires both qualitative and quantitative data in order to discover influential factors and generalise the findings. This mix of research design methods is supported by a host of scholars (see for example Churchill, 1987; Baker, 1991; Chisnall, 1997; Aaker et al., 1998). Thus, a triangulation approach to the research was undertaken, incorporating a review of literature, qualitative data (interviews) and quantitative data (mail surveys).

The adopted research design and process is illustrated in Figure 6.1. The process commenced with a review of extant literature, which was presented in Chapters 3-5. The literature review facilitated the formulation of specific research objectives and questions, based in part on discovered gaps in the literature. This was followed by a series of 12 exploratory personal interviews (6 in the UK and 6 in the US) designed to probe and explore the research issues so as to gain a deeper understanding of pertinent influential factors. Next, the qualitative data collected from the interviews was analysed and the findings utilised both to enhance the development of the mail survey questionnaire and to augment literature review findings for the development of the research propositions. A mail survey was then conducted in the UK and US using a questionnaire developed from both prior empirical study findings and this study's qualitative findings, rendering large samples that facilitated the generalisation of the findings. The quantitative findings were then statistically analysed and the conclusions and resulting framework described.

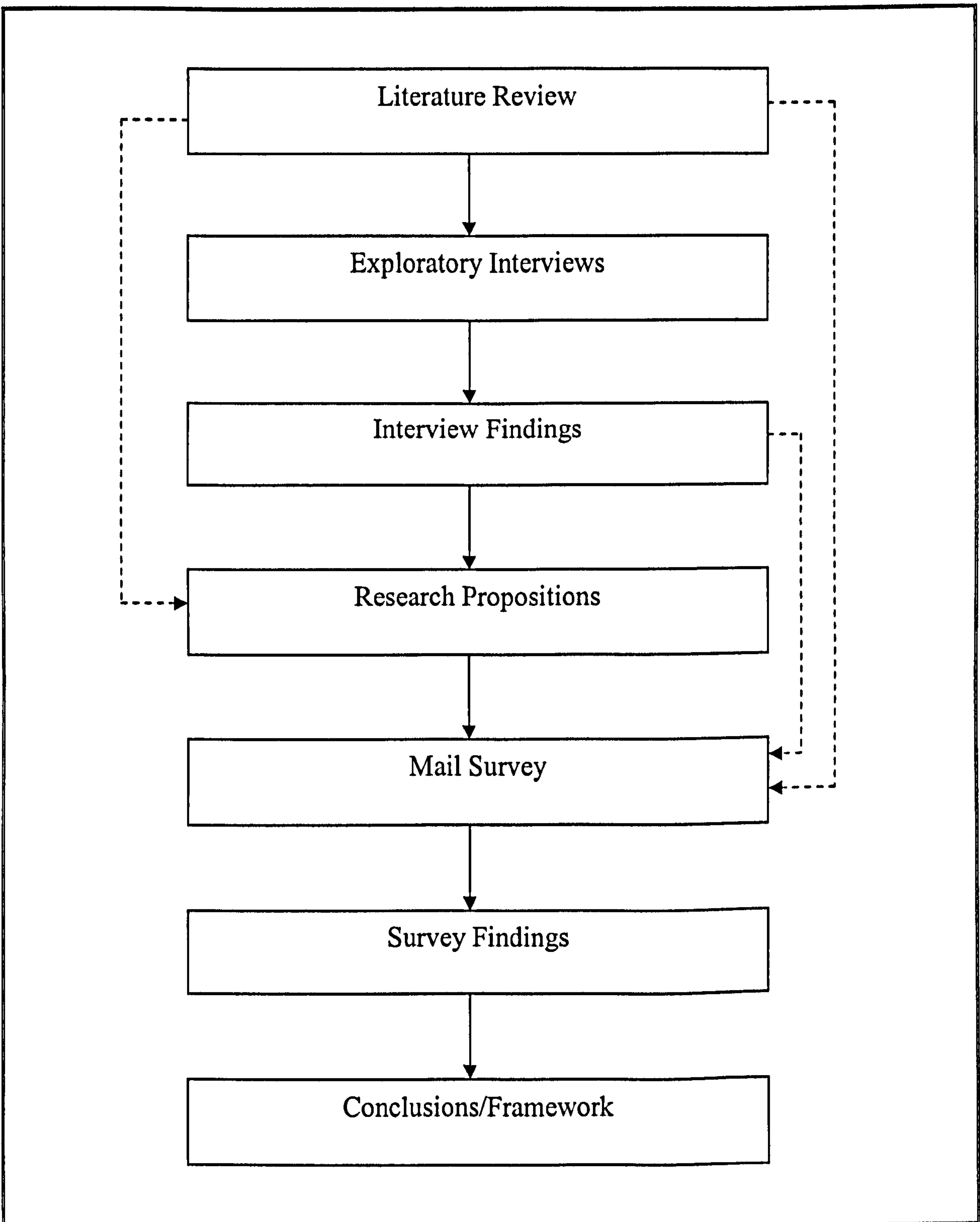


Figure 6.1: Research Process

Whereas this section provided a broad overview of the study's research design and process, the following sections chronologically detail the research methodology. Section 6.4 defines the study's population and stipulates the selection criteria for the study's counties, sectors and companies. Section 6.5 describes the qualitative phase of the research, including the selection process for the interviewed firms, the design

of the questions and the procedures followed. Finally, Section 6.6 outlines the methodological specifics of the quantitative phase of the research, including the questionnaire design, pre-testing, mailing and follow-up procedures, response rate and tests for non-response bias.

6.4 POPULATION DEFINITION AND SAMPLING FRAME

Sampling success is dependent on the efficacy of the population definition and sampling frame (Chisnall, 1997). Population definition refers to the classification of people or elements of interest in a research study from which a sample will be drawn (Alreck and Settle, 1995), while a sampling frame is the list of all members of a population. This section defines the study's population and describes the sampling frame, along with providing the rationale for the selection of the countries, sectors and firms involved in the study.

The two populations examined in this research study were UK and US small high technology international start-ups. Each of the elements comprising the population definition will be individually reviewed in this section, followed by the delineation of the sampling frame. The UK and US were selected as the study's countries for three principal reasons. First, based on both prior academic study findings and the magnitude of international business activity conducted in each nation, international start-ups in the two countries were likely to be present and identifiable in sufficient quantity to conduct the study. Second, the two countries represent leading world economies in the key international business hubs of North America and Europe, with business and cultural similarities, providing the basis for a sound comparison of international start-ups in the two nations. And third, the researcher's US nationality and UK domicile provided vital background knowledge of the business environment of two countries as well as facilitated the logistics of the study.

With the basis for the study's countries selection established, the population definition elements of 'small' and 'high technology' will now be described. 'Small'

was defined for purposes of this study as having fewer than 100 employees at the time of initial international activity (see Chapter 2), which is in congruence with the OECD's (1997) definition in its report on globalisation and SMEs. Small firms were the focus of the study since most international start-ups are small in size initially (see Chapter 4) and the harmonisation of firm size facilitates comparison. Firms in the study were regarded as being 'high technology' if they operated within prescribed high technology sectors and exhibited evidence of ongoing R&D activity (see Chapter 2). Three high technology sectors were selected for inclusion in the study: computer software, computer hardware and electronics. The sectors were selected based on their international nature (i.e. world-wide application and usage), the substantial size of each sector in both countries (facilitating sampling) and their comparability across countries (e.g. laws pertaining to biotechnology products are restrictive and vary by country, thereby making comparisons problematic). High technology firms were the focus of the study due to their prevalence amongst international start-ups, as noted by prior empirical studies (see Chapter 4), as well as the comparability of many high technology sectors across nations.

The final element of the population definition to describe is an 'international start-up'. An international start-up was defined in Chapter 2 as a new venture that exhibits an innate propensity to engage in a meaningful level of international business activity at or near inception, with the intent of achieving strategic competitive advantage. The determination of definitional fit was gauged in this study by the analysis of the following indicators and measures, which were influenced and supported by the work of researchers in this area (for example Oviatt and McDougall, 1994, 1997; Knight, Madsen, Servais and Rasmussen, 2000; Zahra, Ireland and Hitt, 2000):

- The founder(s) of the firm must have had an international vision (i.e. international outlook and aspirations) for the company at or within one year of inception, so as to evidence its founding international intent.

- The firm must demonstrate its commitment to international activity by conducting business in at least four foreign countries, including evidence of geographic dispersion measured by at least one country in a different continent than the home country, within five years of founding.
- International sales must represent a minimum of 20 per cent of total firm revenue over the first five years of the company's international activity, indicating substantive international business intensity.
- Although not a direct definitional criterion, evidence of foreign value chain activity (for example foreign-based sales or service offices) indicating early globalisation efforts is reviewed and regarded as indicative of a higher degree of internationalisation.

Having described each element of the population definition, UK and US small high technology international start-ups, the sampling frame will now be delineated. The criteria for the inclusion of firms in the study were:

- computer software, computer hardware, and electronics sectors
- independent, UK or US owned
- formed between 1981-1993
- current international sales
- total sales exceeding £2 million or \$2.5 million.

The rationale for the first company criterion, the study's sectors, was previously discussed in this section. Independent, UK or US owned firms were targeted since the study sought to focus on entrepreneurial start-ups that were not sponsored by other companies and that were not foreign owned. The firms in the study were formed between 1981 and 1993 (i.e. 6-18 years old), so as to be old enough to meet the study's requirement of providing five years of performance data and yet young enough to retain founding-era knowledge. Evidence of international sales was a criterion since the study focused exclusively on international firms. Finally, only

those firms with total current sales exceeding £2 million or \$2.5 million were targeted, so as to exclude exceptionally small firms that likely conducted minimal international business.

The sampling frame was developed using the Kompass Directory for the UK and the CorpTech Directory of Technology Companies for the US. Both directories are highly regarded and widely used for academic studies. A fee was paid to both companies to conduct a search of their databases. Utilising the sampling frame parameters specified above, the searches resulted in the identification of a UK population comprised of 658 firms and a US population comprised of 1036 firms. The sampling frame, including a breakdown by sector, is illustrated in Table 6.3. As will be detailed in the Quantitative Phase section of this chapter (see Section 6.6), a total of 600 firms were surveyed in each country. The 600 firms were randomly selected from each underlying population by the database companies' computers, while maintaining the same ratio of firms for each sector. The breakdown of the UK and US samples by sector is illustrated in Table 6.3.

Sector	UK Population	UK Sample	US Population	US Sample
Computer Software	83	76	558	323
Computer Hardware	164	150	266	154
Electronics	411	374	212	123
Totals	658	600	1036	600

Table 6.3: Sampling Frame

6.5 QUALITATIVE PHASE

Baker (1991) contends that qualitative research is frequently a prerequisite to quantitative research since it aids in the clarification of issues to be addressed, the parameters to be defined and the identification of likely relationships. Based on this argument and the limited nature of academic knowledge regarding international start-

ups, it was appropriate for the research process to commence with exploratory personal interviews so as to identify, in conjunction with extant literature, factors related to the study's research questions, which in turn could be quantitatively tested with large sample sizes in order to make inferences about the populations. Thus, the overall objective of the exploratory personal interviews was to qualitatively determine success factors (i.e. Research Question 1) and influential factors (i.e. Research Questions 2-4) for small high technology international start-ups so as to confirm prior empirical study findings and more importantly to explore and uncover factors not noted in the limited extant literature.

To accomplish this objective, a series of personal interviews were conducted in both countries involved in the study. Accordingly, 12 interviews were undertaken between April and June of 1999 with founders and top executives of firms that were deemed after initial analysis to approximate the characteristics of small high technology international start-ups. Six of these firms were located in the UK and six in the US. In order to facilitate the research process and in light of resource constraints, the interviewed UK firms were all located in Central Scotland, while the US firms were all located in the greater Boston area. Both locations represent key high technology centres in the two nations.

Prospective UK interviewees were identified with the assistance of Scottish Enterprise as well as University of Strathclyde academics, while prospective US interviewees were identified through American academics involved in the research of international start-ups and the CorpTech directory. An analysis of secondary data was then conducted in order to determine the suitability of the firms for inclusion in the study. Firms were deemed to be acceptable and were subsequently targeted if they appeared to meet the study's criteria to be classed as small high technology international start-ups, as described in the previous section. Based on the results on the analysis, the top executives of 12 UK and 12 US firms encompassing the study's three sectors were sent letters describing the study and asking for their participation (see Appendix C). The importance of the study was emphasised and participating individuals were offered a copy of the study's findings. The executives were told in

the letter that they would be receiving a telephone call shortly to confirm their participation and arrange an interview. During the ensuing telephone conversations, the researcher screened the firms to ensure their suitability for inclusion in the study. Furthermore, the importance of meeting with a founder or original member of the top management team was explained (i.e. the critical nature of first-hand founding-era knowledge to the study). The 6 UK and 6 US firms ultimately included in the study were selected based on their likely inclusion in the small high technology international start-up population, as well as the executive's availability and willingness to participate.

Each of the interviews was face-to-face and lasted at least one hour. The interviews were not tape recorded, so as to encourage an open dialogue and be provided with sensitive company data. The full and free disclosure of sensitive company data was further supported by the researcher's promise of anonymity. The interviews were semi-structured in design, enabling the researcher to explore issues related to the study's research objectives, while maintaining an element of control. A detailed interview template (see Appendix A) was developed and utilised in order to direct the flow of questions and rapidly and accurately record key data.

The interview questions were structured into two distinct phases. The first phase was qualitative in nature, with open-ended questions. The questions were designed to explore and probe factors related to each of the study's four research questions. The 24 questions comprising Phase 1 sought to:

- determine if the firm met the study's definitional parameters to be classed as a small high technology international start-up
- identify the firm's initial country markets and the factors influencing their selection
- determine if foreign organisational activities were established early in the firm's existence, why they were established, how the locations were selected and how any why they were co-ordinated

- identify factors influencing the firm's early internationalisation and why the firm had an early international focus rather than domestic
- identify founder, organisation and product and marketing strategy characteristics leading to the success of the firm's early internationalisation as well as additional factors that could have enhanced the success of the firm if they had been implemented.

Whereas Phase 1 was qualitative in nature, represented the core of the interview agenda and encompassed the majority of the interview time, Phase 2 was highly structured in nature, designed to rapidly examine prior empirical study findings related to the study's primary and secondary research questions (i.e. Research Questions 1 and 2). The principal objective was to explore the understanding and wording of numerous factors noted in previous studies so as to aid in the ensuing questionnaire development process. The interviewees were asked to rate the level of importance of 19 factors (discerned from the literature) leading to the early internationalisation of the firm, utilising a 5-point Likert scale ranging from 'none' to 'substantial'. Similarly, the interviewees were asked to rate the level of importance of 39 founder, organisation and product and marketing strategy factors (as identified by previous empirical studies) to the firm's early internationalisation success, utilising the same 5-point Likert scale.

The interview findings, which are presented in Chapter 7, were in turn utilised in conjunction with previous research findings to develop the study's research propositions and construct the questionnaire for the mail survey. The design of the questionnaire and its operationalisation as described in the next section.

6.6 QUANTITATIVE PHASE

The qualitative phase of the research was designed to explore and identify factors relating to each of the study's research questions. The principal objective of the ensuing quantitative phase was to test the propositions emanating from these

qualitative findings juxtaposed with previous research findings. A mail survey was selected as the data collection instrument since it enabled a substantial amount of data to be collected from both nations within research budget constraints, with the resulting large samples facilitating generalisability (Tull and Hawkins, 1993). This section describes the design and development of the questionnaire, its pre-testing and the main survey mailing procedures coupled with response analysis.

6.6.1 QUESTIONNAIRE DESIGN

The purpose of the questionnaire (see Appendix B) was to collect data pertaining to each of the study's research questions in order to statistically test the propositions and draw inferences for UK and US small high technology international start-up populations. Accordingly, the instrument was designed to obtain data regarding the firm's characteristics, internationalisation process and history and factors related to the study's four research questions. Additionally, questions were asked to determine if the firm met the study's criteria to be classed as a small high technology international start-up. The structure of the questionnaire, which was comprised of four broad sections, is illustrated in Figure 6.2.

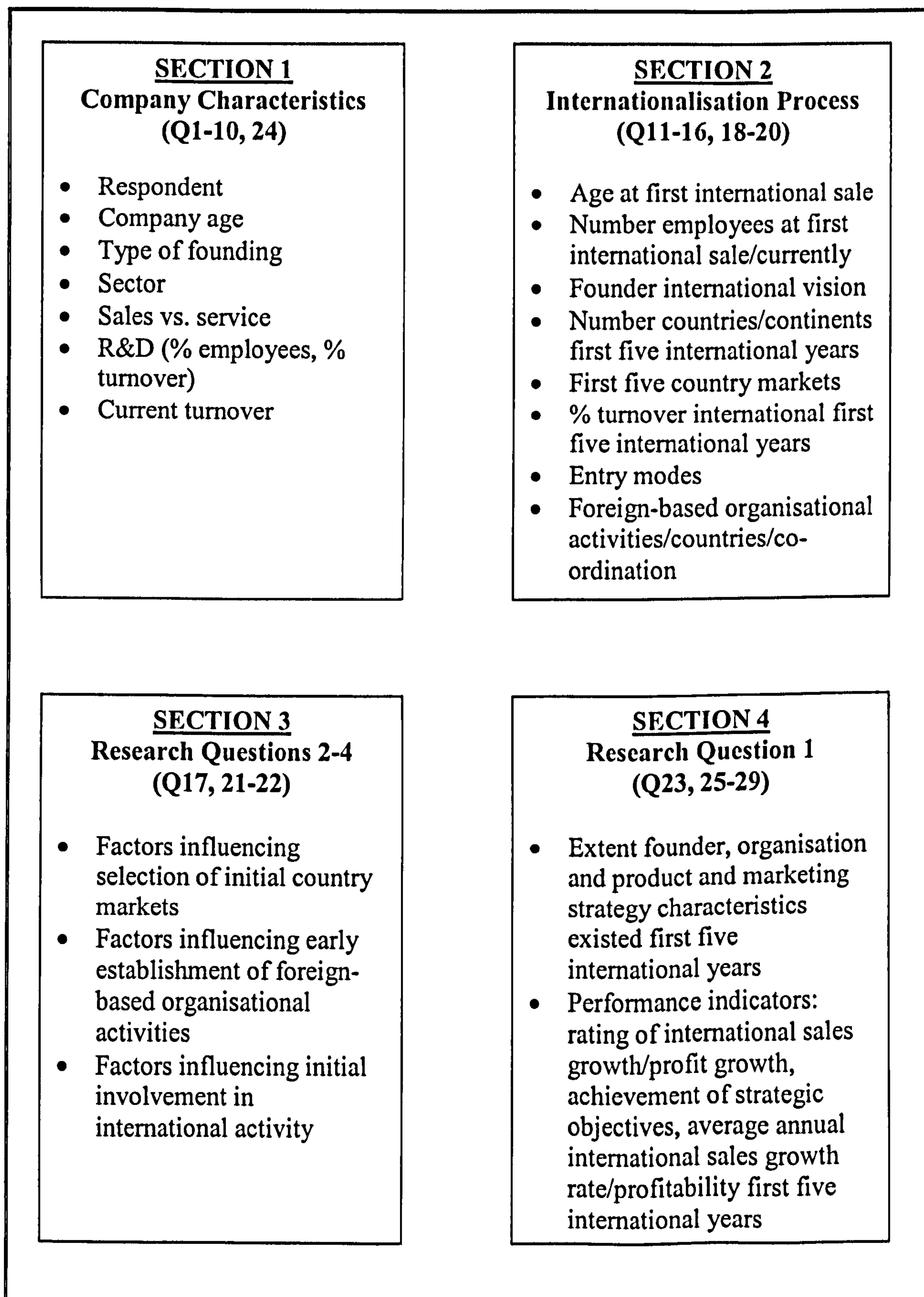


Figure 6.2: Questionnaire Format

The basis for the instrument's questions, specifically the rated factors for each research question, was rooted in theory (see Chapters 3 and 4), previous research

findings (see Chapters 4 and 5) and this study's qualitative findings (see Chapter 7). As will be detailed in Chapter 9, the questionnaire collected data encompassing the study's five performance indicators. Chapter 5 described the measurement of a start-up's performance as problematic and concluded that while no universally accepted method for assessing successful performance exists, the determination of a new venture's continuance, growth and profitability is optimal. Based on a review of international business literature, performance in this study was assessed by subjective and objective measures of international sales growth and international profitability and by the achievement of international strategic objectives (Madsen, 1987; Aaby and Slater, 1989; Brush and Vanderwerf, 1992; Cavusgil and Zou, 1994; McDougall and Oviatt, 1996).

The design of the questionnaire encompassed numerous considerations. Given that the instrument was quite long (i.e. 12 pages including instructions), steps were taken to encourage response. These included the sparse utilisation of open-ended questions, with fixed-alternative and scaled questions being dominant, which also served to facilitate quantitative analysis. Another tactic was to place 'sensitive' company performance questions at the end of the instrument, so as to increase the likelihood of the respondent completing this final section of the questionnaire and returning it. Furthermore, the especially sensitive questions relating to profitability did not ask for specific numbers, but rather utilised 'less threatening' Likert scales to record data, thereby reducing the incidence of item non-response. Finally, the questionnaire was designed to be aesthetically pleasing by being professionally printed in a booklet style, with boldface questions and abundant blank space creating the perception of a less time-consuming survey, thereby further encouraging participation.

A draft of the questionnaire was distributed to eight highly experienced academic researchers, including two from universities other than the University of Strathclyde, in order to evaluate the instrument prior to mailing. Numerous suggestions were given regarding the structure and wording of questions as well as data analysis considerations. The advice led to a series of revisions and drafts of the questionnaire

and the preparation of the instrument for subsequent pre-testing. The pre-testing of the questionnaire is the topic of the next subsection.

6.6.2 QUESTIONNAIRE PRE-TESTING

After revising the questionnaire based on suggestions from experienced academic researchers, a pre-test with small, representative samples was conducted. The purpose of the pre-test was to test the instrument and amend any noted shortcomings prior to commencing with the main mail survey. Applying the recommendations of Reynolds, Diamantopoulos and Schlegelmilch (1993) in their review of questionnaire pre-test design literature, the firms in the pre-test sample were asked to complete the questionnaire and provide assessments of the following attributes on an attached survey comment sheet: ambiguous questions, unclear word meanings, missing response alternatives, layout, sequence and flow, length, cover letter and 'other' comments.

25 UK and 25 US firms were included in the pre-test samples. The firms were randomly selected from the Kompass and CorpTech directories, in accordance with the procedures and criteria delineated in Section 6.4. The firms were sent a questionnaire, survey comment sheet, postage-paid return envelope and cover letter describing the study and pre-test and asking for their participation. 5 usable UK responses were received (20% response rate) along with 4 usable US responses (16% response rate).

Several valuable comments and suggestions were received from the pre-test and actions were subsequently taken to improve the instrument. In a few instances, terms or response choices were found to be unclear and the wording was amended accordingly. For example, the term 'strategic alliance' created confusion and was consequently replaced with 'business partnership'. Another important pre-test finding was the need for a benchmark in two of the performance indicators (Q25-26), which led to the insertion of 'relative to its objectives'. Finally, concern was raised

over the difficulty of estimating the company's average annual growth rate of international sales over its first five years of international activity due to it being "lumpy", "not steady growth" and "difficult to assess". This concern was further exacerbated when 2 of the 9 responding firms failed to answer the question. The problem was rectified by including 'recognising the likelihood of an irregular growth pattern' in parenthesis at the end of the question. Having revised the instrument in accordance with the pre-test findings, the final questionnaire was printed and prepared for posting.

6.6.3 MAILING PROCEDURES AND RESPONSE

600 UK firms and 600 US firms were sent questionnaires in September 1999. The firms were randomly selected from their underlying populations according to the sampling frame described in Table 6.3. Two weeks later, a reminder postcard was sent to all non-respondents. A further two weeks later, a third mailing consisting of another copy of the questionnaire was sent to all firms who had still not responded. The cover letters (see Appendix D) were addressed to a top officer of each firm and both the cover letter and questionnaire instructions emphasised the necessity of the survey being completed by a founder or executive with direct knowledge of the founding conditions and characteristics of the company, due to the retrospective nature of the study.

Numerous measures were taken to increase the likelihood of achieving high mail survey response rates. Following the advice of several scholars researching industrial mail survey response rate (Jobber and Saunders, 1988; Baker, 1991; Diamantopoulos and Schlegelmilch, 1996; Jobber and O'Reilly, 1998), the following procedures were implemented to increase response rate:

- the cover letters were personalised with the executive's name and included the hand-written signature of the researcher in blue ink

- the cover letters were printed on coloured university-headed paper and utilised a combination of ‘egoistic’, ‘altruistic’ and ‘social utility’ appeal
- the respondents were offered confidentiality and a copy of the executive summary of findings
- the questionnaire asked for ‘approximate’ rather than exact figures and incorporated several design features intended to encourage response, as described in Section 6.6.1
- two follow-up mailings were sent, as discussed in the previous paragraph
- pre-paid addressed envelopes were provided for the return of the questionnaire
- the US surveys were given a ‘domestic’ look (i.e. sent and collected from within the US) rather than a ‘foreign’ mail survey appearance.

The last measure noted, creating a ‘domestic look’, led to a major unforeseen problem. The American surveys were all mailed from inside the US. However, while the return envelopes provided for the respondents displayed a US mailing address (Dallas, Texas), they were disguised and coded to be collected in Dallas but forwarded directly on to Glasgow, where the researcher was located. This was an established service offered by Royal Mail. Whereas in principle everything should have proceeded according to plan, in actuality a significant problem developed. Due to the inexperience of Royal Mail’s collection facility personnel in London, which was exacerbated by the somewhat infrequent utilisation of this service, numerous survey responses received in London were improperly returned back to the US since the envelopes had a Dallas mailing address on them. The London personnel failed to comprehend that the mail was to be forwarded to Glasgow. The post office in Dallas then received the mail and sent it back to the UK. A vicious cycle ensued. The researcher realised that a problem existed when the response rate was exceptionally low and several executives e-mailed upon being sent reminder mailings and stated that they had returned the questionnaire quite some time before. After substantial efforts to correct this problem with Royal Mail, it was finally rectified and the researcher ultimately received the ‘well-travelled’ responses. Thus, a key lesson

learned from the research process was to 'expect the unexpected' and understand the complexity of international survey implementation.

As detailed in Table 6.4, a total of 102 usable responses were received from the UK (19.25% response rate) and 89 from the US (18.09% response rate). In order to test for non-response bias, two-sample *t*-tests were conducted for each country with early-to-late responding firms (Armstrong and Overton, 1977). As illustrated in Table 6.5 and 6.6, no significant differences ($p < 0.05$) were found between these two groups amongst a purposive selection of key variables, suggesting minimal bias between responding and non-responding firms.

	UK Firms	US Firms
Original Sample	600	600
Less Discounted Firms:		
<i>Firm not willing to participate</i>	(8)	(19)
<i>Firm not suitable for inclusion in study</i>	(30)	(11)
<i>Addressee no longer with firm</i>	(14)	(31)
<i>Firm moved away</i>	(14)	(25)
<i>Firm ceased trading/bought out</i>	(4)	(22)
Total:	(70)	(108)
Adjusted Sample (original minus discounted)	530	492
Usable Responses	102	89
Response Rate (usable responses / adjusted sample)	19.25%	18.09%

Table 6.4: Response Rate Analysis

	t-test for Equality of Means			
	t	df	Sig. (2-tailed)	Mean Difference
	International Experience	1.102	98	.273
Strategic Alliances/Joint Ventures	1.289	97	.200	.4841
Willingness to Commit Resources Internationally	-.263	97	.793	-.0861
Internationally Experienced Managers	.681	98	.498	.2449
Customer-driven Product Design	1.555	97	.123	.4608
Growth Industry	1.385	97	.169	.4583
Success Rating of International Sales Growth	-.576	100	.566	-.1765
Success Rating of International Profit Growth	-.148	99	.882	-.0427
Founders' International Experience	-.645	97	.521	-.2733
Capitalise on Proprietary Technology Internationally	.291	96	.772	.1239
Key Industry Markets	-.029	93	.977	-.0084
Influence of Network and Alliance Partners	-.338	94	.736	-.0983

Table 6.5: UK Test for Non-response Bias

	t-test for Equality of Means			
	t	df	Sig. (2-tailed)	Mean Difference
International Experience	-.744	85	.459	-.3599
Strategic Alliances/Joint Ventures	-1.024	84	.309	-.4426
Willingness to Commit Resources Internationally	-.845	86	.400	-.2500
Internationally Experienced Managers	-.767	84	.445	-.3023
Customer-driven Product Design	-.165	84	.869	-.0465
Growth Industry	.551	84	.583	.1634
Success Rating of International Sales Growth	-.338	87	.736	-.1086
Success Rating of International Profit Growth	.750	80.201	.455	.2364
Founders' International Experience	-.244	85	.808	-.1205
Capitalise on Proprietary Technology Internationally	1.466	84	.146	.6512
Key Industry Markets	-.985	87	.327	-.2848
Influence of Network and Alliance Partners	.531	84	.597	.1628

Table 6.6: US Test for Non-response Bias

6.7 METHODOLOGICAL NOTE AND SUMMARY

It should be noted that this research project originally focused on global start-ups and later evolved into a study of international start-ups due to the limited number of global start-ups found. As was described in Chapter 2, global start-ups are differentiated from international start-ups by the depth, scope and intensity of their international business activity, including the early establishment of foreign based organisational activities. Firms were classed as global start-ups in this study if they established organisational activities in at least two foreign countries within five years of founding, representing a co-ordinated firm strategy with shared learning experiences, in addition to meeting each of the study's definitional parameters to be classed as international start-ups. Of the 102 UK usable responses received from the mail survey, 49 firms met the definitional parameters to be classed as international start-ups (discussed in Chapter 8), with 18 of these firms meeting the study's criteria to be further classed as global start-ups. Of the 89 US usable responses, 45 were classed as international start-ups, while 24 of these could more precisely be classed as global start-ups. Since the sizes of the UK and US global start-up samples were both small (i.e. $n < 30$), the focus of the study was expanded to international start-ups, so as to facilitate higher level statistical analysis.

This chapter reviewed several alternative approaches to research design and presented and explained the rationale for the adopted research methodology and process. It was concluded that the research was largely exploratory in nature, with accompanying elements of descriptive and causal design, which necessitated a combination of qualitative and quantitative methods to address the research questions. Exploratory personal interviews were conducted in the UK and US, followed by a postal survey in both nations. The combination of methodological approaches enabled the collection of both rich qualitative data and abundant quantitative data from large samples, leading to higher levels of validity, reliability and generalisability. The qualitative findings are presented in the next chapter, while the quantitative findings are described in Chapters 8 and 9, along with details regarding data analysis methods.

Before concluding the chapter, the researcher would like to acknowledge, with great gratitude, the receipt of a research grant by Scottish Enterprise. The researcher was selected as the 1999 Scottish Enterprise John Condliffe Bursary Award recipient for the best Scottish University research proposal contributing to the economic development of Scotland. The grant, which was intended to help cover travel expenses to conduct overseas research, greatly aided the implementation of the research process.

INTRODUCTION

The first part of this chapter presents and discusses the study's qualitative findings, which stem from a series of exploratory interviews conducted with founders and top executives of UK and US early-internationalising high technology firms. The primary objective of the interviews was to collect qualitative data pertaining to each of the study's four research topics/questions in order to identify possible new variables, confirm variables previously identified in the literature and to develop case study material. The study's qualitative findings play a crucial role in the study's overall research design since they serve as the basis, in conjunction with extant literature, for the variables tested in the quantitative phase of the research project. The specific qualitative findings for each research topic are delineated and discussed in Section 7.1.

The second part of the chapter presents six concise case studies derived from the interviews. The primary objective of the case studies was to provide comprehensive illustrations of international start-ups, focusing on the study's four research topics/questions, so as to facilitate a richer and deeper understanding of key variables. The case studies contribute by revealing the details from the viewpoint of the participants as well as by describing the context (Yin, 1994). The six case studies are presented and discussed in Section 7.2.

7.1 QUALITATIVE FINDINGS

As detailed in Chapter 6, the study's qualitative findings are based on exploratory interviews with founders and top executives of 12 UK and US early-

internationalising small high technology firms, which were conducted between April and June of 1999. Six of these firms were located in the UK (Scotland) and six in the US (greater Boston area). The firms that were interviewed were selected based on their adherence to the specific selection parameters delineated in the Research Methodology chapter, as well as their location, willingness to participate in the study and availability to meet. The intent of the selection process was to include likely international start-ups, with foreign-based organisational activities, so as to enable analysis of the study's four research questions.

The profile of the interview participants was as follows. Five of the UK and four of the US interviewees were founders of their firms, with the remaining three being top executives with distinct knowledge of the founding characteristics and strategy of their firms. Four of the UK and three of the US firms were in the computer software industry/sector, two UK and two US firms in the electronics industry/sector and one US firm in the computer hardware industry/sector. Four of the UK firms and five of the US firms established foreign-based organisational activities very early in their existence, while the remaining three established foreign-based organisational activities at a later stage. Finally, four of the UK and four of the US firms rated the early internationalisation of their firms to be an economic and strategic success, while the remaining four indicated a lesser degree of initial success, particularly economic.

All six of the UK firms and three of the US firms met the study's definitional criteria to be classed as small high technology international start-ups (as defined in Chapter 2). The three residual US firms, while not meeting the parameters, were markedly close to satisfying the study's requirements. While these three firms closely mirrored the characteristics of international start-ups, they are best described as early-internationalising small high technology firms. Based on this international start-up data coupled with the profile data in the previous paragraph, the interviewed firms were highly suitable for inclusion in the study and facilitated the ensuing qualitative analysis of the research questions.

As described in the Research Methodology chapter, the interviews were exploratory in nature and semi-structured. The interviewees were asked numerous open-ended questions in order to collect unbiased data. The interviews focused primarily on the study's four research topics/questions, which were delineated in Chapter 6. The interview findings for each of the four research questions are individually presented in the following four subsections, followed by a discussion of the key findings.

7.1.1 EARLY INTERNATIONALISATION SUCCESS FACTORS

This section examines the qualitative findings pertaining to Research Question 1, the primary research question of the study. The research question sought to identify founder, organisation and product and marketing strategy characteristics leading to the success of small high technology international start-ups. The interviewees were asked four open-ended questions in order to collect the pertinent data (see Interview Template Questions 21-24 in Appendix A). The first three questions individually sought the identification of founder, organisation and product and marketing strategy characteristics that led to the success of the firm's early internationalisation. The fourth question asked for the identification of additional founder, organisation and product and marketing strategy characteristics that could have enhanced the success of the firm if they had been implemented.

When the interviewees were asked to identify specific factors that led to the success of their early international activity, a wide variety of responses were recorded. Table 7.1 illustrates the success factors identified by the firms, along with the frequency of the factor identification. The identified factors were categorised under the headings of founder, organisation and product and marketing strategy. The factors in the table printed in italics indicate that they have not been previously identified in the international start-up literature.

Identified Success Factors	UK Firms n=6	US Firms n=6	Total Firms n=12
Founder:			
International experience	1	3	4
Affiliation and recognition within scientific community	1	1	2
<i>Determination and tenacity</i>	4	1	5
International vision	1	1	2
Previous industry experience	1	0	1
<i>Mix of technical and business skills</i>	1	1	2
Acquisition of adequate capitalisation	1	0	1
<i>Support for sales function</i>	0	1	1
<i>Commitment to be an industry leader</i>	0	2	2
<i>Open-mindedness regarding international opportunities</i>	0	1	1
Organisation:			
Experienced and proven sales personnel	1	0	1
High quality personnel	3	1	4
<i>Customer focused staff</i>	1	0	1
<i>Ambitious, goal-driven internal behaviour</i>	1	0	1
<i>Flat organisational structure</i>	2	0	2
<i>Entrepreneurial spirit amongst staff</i>	1	0	1
Internationally experienced managers	0	1	1
Emphasis on R&D activities	0	1	1
<i>Business minds amongst staff</i>	0	1	1
<i>Strong accounting and legal functions</i>	0	2	2
Product and Marketing Strategy:			
Unique products	1	0	1
<i>Clear marketing strategy</i>	2	0	2
<i>Customer-driven product design</i>	1	0	1
Flexibility due to short product life cycles	1	0	1
Clear understanding of market	1	0	1

<i>Participation in trade shows</i>	1	1	2
<i>Creation of the perception of a 'local' company in foreign markets</i>	3	0	3
<i>Sales to academics and universities</i>	0	1	1
Products designed for widespread international markets	0	1	1
<i>Unique licensing structure</i>	0	1	1
Utilisation of strategic alliances and partnerships	0	1	1

Note:

Italics indicates success factor not previously identified in the literature

Table 7.1: Identified Early Internationalisation Success Factors

Four success factors identified by the interviewees were of particular importance, as indicated by the frequency of the responses (i.e. ≥ 3 of 12, or 25%). The *international experience of the founder(s)* was identified by three of the six interviewed US firms as well as by one UK firm as being of importance to the success of their early international activity, which supports the findings of Oviatt and McDougall (1995) and Roberts and Senturia (1996). Additionally, the *founders' determination and tenacity* was noted as being of great importance to their success, as evidenced by the identification by four of six UK firms and one US firm, thereby representing a newly identified international start-up success factor. In terms of organisational factors, having *high quality personnel* was noted as being key to the early internationalisation success of three UK firms and one US firm, which supports the export success factor findings of Kamath et al. (1987). Lastly, the *creation of the perception of a 'local' company in foreign markets* was listed by three UK firms as being important to their marketing success, which represents a new-found international start-up success factor.

While it is alluring to make deductions about international start-ups based on these qualitative findings and propose explanations for differences in the findings for the UK and US firms, caution must be exercised due to the small sample sizes of the interviewed firms. The interviews were exploratory in nature and intended to gain

insight into key success factors for international start-ups as well as to provide a list of factors to be examined in the subsequent mail survey phase of the research. The mail surveys enable statistical inferences to be drawn for UK and US international start-up populations due to their large underlying sample sizes. The quantitative analysis and mail survey findings for this research question are presented in Chapter 9.

7.1.2 FACTORS INFLUENCING EARLY INTERNATIONALISATION

This section presents and analyses the qualitative findings associated with Research Question 2, which represents a key research question in the study. The research question seeks to identify factors influencing small high technology start-ups to be international at or near inception. Since all of the interviewed firms were international markedly early in their existence and were small high technology start-ups, the sample was highly appropriate for addressing the research question. Interview Template Question 19 (see Appendix A) asked the interviewees to identify factors that led to the new venture being international early in its existence as well as to explain the firm's early international focus rather than domestic. Table 7.2 illustrates the influential factors identified by the firms as well as the frequency of the factor identification.

Identified Factors	UK Firms n=6	US Firms n=6	Total Firms n=12
Founders' international experience	1	1	2
<i>Prospective customers were foreign</i>	1	2	3
Firm's technology widely applicable world-wide	2	1	3
<i>Personal knowledge of international customers</i>	1	0	1
International nature of product/industry	4	1	5
Short product life cycles required international marketing	1	0	1
Small domestic market	3	1	4
Founders' international vision	1	0	1
Easier to build international company when young and small	1	0	1
Inherent opportunities of international markets	0	2	2
<i>OEM customers sold firm's products internationally</i>	1	1	2
<i>International contacts and sales leads</i>	0	1	1
<i>Desire to be an international market leader</i>	0	1	1
'First entry' strategy required international presence	1	1	2
<i>Founders' affinity for international business</i>	0	1	1

Note:

Italics indicates factor not previously identified in the literature

Table 7.2: Identified Factors Influencing Early Internationalisation

Four factors identified by the interviewees were of particular importance, as indicated by the frequency of the responses (i.e. ≥ 3 of 12, or 25%). These key factors influencing small high technology start-ups to be international at or near inception were: *prospective customers were foreign*, *firm's technology widely applicable world-wide*, *the international nature of the product/industry* and *having a small domestic market*. The 'prospective customers were foreign' finding represents a newly identified factor influencing early internationalisation, while the factor 'the firm's technology is widely applicable world-wide' supports the findings of

McDougall and Oviatt (1991), 'the international nature of the product/industry' supports the findings of Litvak (1990), Coviello and Munro (1995) and Bloodgood and Sapienza (1996), and 'having a small domestic market' supports Lindqvist (1990, 1997), Coviello and Munro (1995) and Madsen and Servais (1997). These factors, along with the others identified in the table, were subsequently included in the mail survey and tested with larger sample sizes in order to make statistical inferences about UK and US small high technology international start-ups (see Chapter 8).

7.1.3 FACTORS INFLUENCING SELECTION OF INITIAL COUNTRY MARKETS

This section presents and analyses the interview findings related to Research Question 3. The research question involves the identification of key factors influencing the selection of initial country markets for small high technology international start-ups. Since nine of the interviewed firms met the study's definitional parameters to be classed as international start-ups and the remaining three very closely approximated the criteria, the firms represent a satisfactory sample to qualitatively analyse the research question. Interview Template Question 12 (see Appendix A) asked the interviewees to explain how and why their initial country markets were selected. The responses and frequencies are illustrated in Table 7.3.

Identified Factors	UK Firms n=6	US Firms n=6	Total Firms n=12
Interest of foreign distributor	1	0	1
Direct foreign customer solicitation	2	0	2
International contacts and sales leads	1	2	3
Location of large, leading market	3	3	6
Geographic accessibility	0	1	1
English-speaking country	0	1	1

Table 7.3: Identified Factors Influencing Selection of Initial Country Markets

Two factors identified by the interviewees were found to be particularly influential in the selection of initial country markets, as indicated by the frequency of the responses (i.e. ≥ 3 of 12, or 25%). The two factors were: *international contacts and sales leads*, which supports the findings of Oviatt and McDougall (1995), and *location of a large/leading market*, which supports the findings of Jolly, Alahuhta and Jeannet (1992), Oviatt and McDougall (1995), Bell (1995) and Lindqvist (1997). The final factor, the location of a large/leading market, was found to be of distinct importance, as evidenced by it being identified by half of the firms. All of these factors were incorporated in the mail survey and are quantitatively analysed in Chapter 8.

7.1.4 FACTORS INFLUENCING EARLY ESTABLISHMENT OF FOREIGN-BASED ORGANISATIONAL ACTIVITIES

This final qualitative analysis section presents and analyses the interview findings related to Research Question 4. The research question seeks to identify key factors influencing small high technology international start-ups to establish foreign-based organisational activities (e.g. foreign sales or service offices) early in their existence. While not all international start-ups establish foreign-based organisational activities in their early years, many do and this research question sets out to determine the

underlying reasons. Since 9 of the 12 interviewed firms established foreign-based organisational activities very early in their existence (i.e. ≤ 5 years) and the remaining three firms within ten years, the interviewed firms sample satisfactorily facilitated qualitative analysis of the research question. Interview Template Question 15 (see Appendix A) asked the interviewees to explain why the firm chose to locate organisational activities in foreign countries early in its existence. The responses and frequencies are illustrated in Table 7.4

Identified Factors/Objectives	UK Firms n=6	US Firms n=6	Total Firms n=12
To create perception of a 'local' company	2	0	2
To establish a 'physical' presence in key industry markets	6	5	11
Need for presence at major customer's site	1	1	2
To provide regional support	2	3	5
Obligation to locate near funding source	0	1	1
To better compete in a major competitor's 'home-ground'	0	2	2

Table 7.4: Identified Factors/Objectives Influencing Early Establishment of Foreign-Based Organisational Activities

Two factors/objectives identified by the interviewees were found to be of particular importance, as indicated by the frequency of the responses (i.e. ≥ 3 of 12, or 25%). The two factors were: *to establish a 'physical' presence in key industry markets* (N.B. identified by 11 of the 12 firms) and *to provide regional support*, which support the findings of Litvak (1990) and Lindqvist (1997). All of these factors/objectives were subsequently included in the mail survey and are quantitatively analysed in Chapter 8.

7.1.5 DISCUSSION

Overall, the 12 firms involved in the qualitative phase of the study were highly suitable. The firms largely met the study's definitional parameters to be classed as international start-ups and encompassed all three of the study's industry sectors. Furthermore, all 12 interviewees had distinct knowledge of the founding characteristics and strategy of their firms, which was critical due to the retrospective nature of the study. Consequently, the high suitability of the firms facilitated both the quality of the findings and the accurate identification of factors related to the study's four research questions.

The study's primary research question sought to identify founder, organisation and product and marketing strategy characteristics leading to the success of small high technology international start-ups. The study's interviews with founders and top managers of these firms led to the identification of four key success factors. The first two factors pertain to founder traits. The international experience of the founder(s) was found to be of particular importance to the success of the firm, which is consistent with Oviatt and McDougall's (1995) findings. Several of the interviewees had previous work experience abroad or were previously involved in international business, which served to greatly enhance their understanding of the practicalities of conducting international business as well as raise their cultural awareness. This international experience ultimately proved to be highly valuable during the firms' early internationalisation process. The second important success factor identified was the determination and tenacity of the founder(s). Many of the interviewees expressed the clear need for the founders and top managers to be firmly determined and committed to the pursuit of international opportunities and markets in order to successfully overcome the obstacles and difficulties new firms inevitably encounter when engaging in international activity early-on.

The final two success factors identified in the interviews as being of particular importance pertain to organisational and strategy characteristics. Having high quality personnel was noted as being crucial to the early internationalisation success

of the firms. A recurring theme surfacing during the interviews was the critical need to have top quality employees and managers involved not only in the core technology of the firm, but also in other key functional areas such as marketing and finance. The final success factor identified was the strategy of creating the perception of a local company in foreign markets. This strategy was identified by half of the UK firms interviewed, while not being noted by any US firms. UK interviewees believed that it was critical to be perceived as a local company in international markets and consequently established small sales and support offices in key country markets in order to create a local identity. The UK firms most frequently employed this strategy in the US. The rationale was to enhance the credibility of the firm by not being viewed as a small UK firm attempting to conduct business abroad, but rather as an established and stable local company that was capable of delivering proper after-sale support.

The study's second research question involved the identification of factors influencing small high technology start-ups to be international in nature at or near inception. The interviews led to the identification of four principal factors. The most frequently identified factor was the international nature of the firm's product and/or industry. Several of the interviewed firms explained that their product and industry had become distinctly international in nature and they subsequently felt compelled to pursue key customers in leading industry markets around the world early in their existence in order to compete and be successful. Closely related to this factor are two others found to be of particular importance, that the firm's technology was widely applicable world-wide and that prospective customers were foreign. Thus, the recognition of international opportunities associated with the firm's core technology and the identification of important prospective customers abroad, coupled with international industry competitive pressure, provide a partial explanation for the early internationalisation of small high technology start-ups.

The final factor found to be particularly influential in the early internationalisation of the firms that were interviewed was having a small domestic market. Half of the UK firms identified this factor as being of major importance. Interestingly, one of the

US firms identified this factor as well, despite the overall vastness of the US domestic market. The interviewees explained that small high technology start-ups often conduct business in niche markets, which may be quite small in the home country regardless of the size of the overall domestic market. Therefore, the firms must target these niche markets world-wide in order to expand profits and grow.

The study's third research question sought to identify factors influencing the selection of initial country markets for small high technology international start-ups. The interviews led to the identification of two main factors. The firms were found to principally select their initial foreign markets based on the markets being large and leading industry centres. Despite the typical resource constraints experienced by most new ventures, the founders and top managers of international start-ups are generally determined to penetrate these large and leading markets, which is often achieved through business partnering and strategic alliances. They believe that it is critical to the success of their firms to do business in these key industry markets and consequently target these markets early-on. Firms were also found to select initial country markets based on international contacts and sales leads. Founders and top managers often had previous international business experience and as a result had developed important international business contacts as well as had identified potential sales opportunities. Their initial selection of country markets was frequently influenced by these contacts and specific international sales opportunities.

The final research question set out to identify factors influencing the early establishment of foreign-based organisational activities. The firms resoundingly identified the primary objective as being to establish a physical presence in key industry markets. Leading industry markets were targeted from the beginning and the founders and top managers felt that it was crucial to locate sales and support offices in these markets to effectively penetrate these markets as well as provide better regional support. This latter objective, to provide better regional support, was found to be the second most influential factor for the early establishment of foreign-based organisational activities.

7.2 CASE STUDIES

This section presents six concise case studies selected from the firms included in the interview phase of the research. The case studies, three from the UK and three from the US, were selected based on their ability to depict and exemplify the dimensions of the study's four research questions. The objectives for including case studies in the thesis were to add depth and richness to the qualitative findings of the study through case narratives and to enhance the understanding of international start-ups by providing company illustrations. Each case study provides an overview of the company's background and current business profile, describes its early internationalisation activity, examines factors influencing its early internationalisation and analyses early internationalisation success factors. The information for the case studies was derived from in-depth interviews with the founders and top management of the firms as well as secondary company data. The names of the firms are disguised, since the researcher promised anonymity in order to encourage an open dialogue and be provided with sensitive company data.

7.2.1 'ALPHA' CORPORATION (US)

Background and current profile. 'Alpha' is a Boston area computer software firm providing process manufacturers with solutions to enhance the design, operation and management of their production facilities and international supply chain. These solutions facilitate the reduction of raw material, energy and capital expenditures, improve customer service, reduce inventory, enhance product quality, ensure compliance with environmental and safety regulations and truncate the time required to convert production processes. The origins of the company stem from a 1976-1981 research project conducted at the Massachusetts Institute of Technology (MIT). Eight faculty members from the university's chemical engineering department commercialised the technology developed during the six-year project and founded Alpha in 1981. Since then, the company has further developed the initial technology as well as designed new products and grown to become a world leader in the process

manufacturing software industry. Evidence of its market penetration in its three largest market segments is illustrated by its products being used by 44 of the world's top 50 chemical companies, 17 of the world's top 20 petroleum companies and 16 of the world's top 20 pharmaceutical companies.

Alpha has experienced revenue gains every year since 1983 and currently has an annual turnover exceeding \$250 million, yielding \$28 million in net income. Approximately 55% of this revenue is derived from the licensing of its software products, while the other 45% is generated from consulting services. International sales account for 45-50% of the revenue. While the company is headquartered in the Boston area, it employs more than 1500 people across 30 offices world-wide, spanning North America, South America, Europe, Asia and Africa. In addition to this extensive international presence, the firm maintains distributors or representatives in seven additional countries. 26% of its workforce is dedicated to new product development, with about 17% of its revenue being allocated to R&D. The firm became a publicly traded company in 1994.

Early internationalisation activity. Alpha had an international orientation from inception, as evidenced by approximately 50% of its revenue being derived from international sales during each of its first five years of operation. This early commitment to international business emanated from the 1976-1981 MIT research project, which was funded by more than 50 industrial participants from around the world, as well as by the US Department of Energy. The inclusion of international investors in the project led to high world-wide visibility and recognition of the project's leading-edge technology. When the company spun-off in 1981 these investors were responsible for numerous international sales leads, which in turn resulted in half of the new company's total revenue being derived from overseas sales.

In the first five years of the company's existence it conducted business (i.e. software licensing and consulting services) in eight foreign countries spanning the world. The country markets initially targeted were: China, Australia, Germany, France, Belgium,

Holland, Norway and the United Kingdom. The country markets were chosen as a result of contacts received through participation in the MIT research project, as previously discussed.

In support of this international business activity, Alpha engaged in early foreign direct investment. The company opened a sales support office in Holland, which was later moved to Belgium, in 1983. The rationale for the foreign direct investment was to create a European presence in a neutral and central location and to support its European business activity. The company likewise opened a sales support and service office in Japan in 1987 in order to have a local presence and support its sales endeavours. Japan had a very strong chemical engineering industry at that time and the company concluded that foreign direct investment was essential. These foreign organisational activities were and continue to be part of a co-ordinated firm-wide strategy, with free-flowing information and extensive key-person travel.

Alpha can definitively be classed as an international start-up, as defined in Chapter 2. The basis for this classification of the company stems from its meeting the definitional criteria previously set forth in this thesis, as evidenced below. First, the founder interviewed for this case study indicated that the founding team had a profound international vision for the company from inception. Second, the company sold its products and services in eight foreign countries spanning three continents in its first five years of existence. Third, international sales accounted for approximately 50% of total firm revenue during each of its first five years. And fourth, while not a requisite criterion to be classed as an international start-up, the company demonstrated its commitment to early globalisation by the establishment of two foreign sales support offices encompassing two different continents in its first five years of operation, representing a co-ordinated strategy with shared learning experiences. (N.B. the opening of the Japan office was initiated in 1986 and completed in early 1987). Based on these attributes, its industry/sector coupled with significant ongoing R&D activity and having only ten employees at the time of initial internationalisation, Alpha was a small high technology international start-up (as defined in this study).

Factors influencing early internationalisation. The early internationalisation of Alpha can largely be attributed to the international contacts and sales leads that emerged from the MIT project that preceded the company formation. These leads rapidly turned into contracts, resulting in Alpha engaging in international business from the outset. The ensuing globalisation process (i.e. early foreign direct investment) resulted from the necessity to provide local support to its geographically dispersed international markets.

The founder interviewed for this case study identified the following factors as being the most important to the firm's decision to be international from inception: the international vision of the founders, founders' international experience, identification of specific international opportunities, desire to exploit a proprietary technology internationally, to provide additional market opportunities and the international and competitive nature of the firm's industry. These factors were given the highest rating when presented with a list of factors that were found by previous empirical studies to influence the formation of international start-ups.

Early internationalisation success factors. The founder of Alpha interviewed for this study deemed the early internationalisation of the firm to be a success, both strategically and economically (i.e. revenue and profits). The founder provided numerous explanations for this success, which will be detailed in this sub-section. However, the overriding success factor noted was the "belief in the possibility of doing business on an international scale". The interviewee went on to state that a new firm aspiring to engage in international business must believe that there are "not any instrumental barriers and that it can do it".

The interviewee provided four characteristics and activities of the founders that contributed to the success of the firm's early internationalisation. First, several of the founders were well known in the industry as a result of their academic publications. This recognition of technical proficiency and expertise facilitated the securing of contracts at the firm's founding. Second, the founders had strong business

orientations in addition to their technical qualifications, which was paramount to the survival, development and marked growth of the company. Third, the founders earnestly believed in and supported the sales function and invested considerable resources to facilitate its success. And fourth, the founding team was strongly dedicated both to providing leading technology and being the leader in their industry.

The interviewee likewise deemed the early emphasis placed on internal business functions to be contributory to the success of the firm's early internationalisation. The company recognised the "importance of business minds amongst the staff" from the beginning. For example, the company had a very strong internal accounting function and retained the services of one of the world's largest and most prominent accounting firms early in its existence. This, in tandem with the firm's in-house lawyer, assured that the company's accounting, tax and legal interests were being properly attended to during its initial and subsequent engagement in international business.

The company founder interviewed for the study identified the firm's unique licensing structure as being a key marketing strategy success factor. While front-end fee with small annual retainer arrangements were the industry norm for licenses, the company chose to receive its software license payments in annual instalments for a period of 3-5 years, which not only attracted licensees but also ensured a constant revenue stream to the firm. Furthermore, due to the licensees' satisfaction with the software along with their growing familiarity and dependence on the product, the company enjoyed a renewal rate of approximately 95% once the license term expired.

When presented with an extensive list of founder, organisation and product and marketing strategy success factors identified in previous academic studies, the interviewee rated the following as the most important to the firm's early internationalisation success: having the highest quality personnel available, competing with differentiated products, having high quality products and engaging in a process of continuous innovation. The company founder interviewed for this case study contended that these factors along with the others described in this section

largely accounted for the tremendous success realised by this small high technology international start-up.

7.2.2 'BETA' CORPORATION (US)

Background and current profile. 'Beta' is a Boston area computer software firm providing database marketing software and consulting services designed to assist businesses in maximising the value of their customer relationships. The software and consulting services enable businesses to identify customer segments with the highest profit potential and subsequently optimise the value of these segments by planning a highly targeted direct-marketing campaign. Beta was formed in late 1994 by a single founder who transformed his marketing consulting firm into a marketing software solutions company. The new company began selling licenses for its proprietary software in 1996 and has since experienced rapid expansion and growth through a series of strategic alliances and partnerships. These alliance partners, who include prominent computer firms such as IBM, NCR and Compaq, resell Beta's software, resulting in its products being utilised by companies world-wide. Its impressive customer list crosses numerous industries and includes Federal Express, Staples, Bank of America, NatWest, Sky TV and Dutch Railways. Furthermore, its software has been the recipient of numerous awards and has received wide-spread recognition.

Although the company is very young, it has achieved noteworthy sales growth and currently has an annual turnover of approximately \$25 million. However, the company is presently unprofitable, with a current annual net loss of nearly \$1 million. 60% of Beta's revenue is derived from software licensing, while the remaining 40% stems from its consulting services. 20-25% of this revenue is currently attributable to international sales. The company employs 70 people and maintains offices in London, Sydney and Denver in addition to its headquarters in Boston. 35% of its employees and 22% of its revenue is dedicated to R&D. Beta became a publicly traded company in 1998.

Early internationalisation activity. Beta sold its first international license, which was implemented across three European countries, in 1997, the year following its commercial product release. Over the next two years, 1997-1999, the company's international business rapidly expanded, as evidenced by its sales in 20 foreign countries spanning several continents. These country markets included: Australia, Singapore, Hong Kong, Japan, Taiwan, India, Argentina, Chile, Canada and most of Europe. The selection criteria for these markets were primarily based on market potential, ease of delivery and language (i.e. English speaking markets first). The company's rapid international sales growth is further illustrated by 5% of its total 1997 revenue being attributed to international sales, 20% of 1998's revenue and 29% forecasted for 1999. Beta's goal is to expand its international business to a level equating to 40% of total firm revenue.

In support of its expanding international business the company invested in two sales, service and support offices abroad. In 1997 it opened an office in London, with a staff of 20 people. Then in 1998 it opened a 7-person office in Sydney. Beta's chief operating officer (COO), who was interviewed for this study, stated that these offices provided both a springboard and a presence into their regions. In addition, the company's largest European competitor was located in the UK and it felt compelled to have a presence in the competitor's home ground. The interviewee indicated that these foreign sales offices are very much part of a co-ordinated strategy throughout the firm and are computer linked to benefit the entire organisation. Two additional sales, service and support offices were later opened in 1999, one in Germany and the other in Japan.

Beta can clearly be classed as an international start-up, as defined in Chapter 2. The founder of the company had international aspirations for the firm from the beginning, which was manifested very early in its existence. In its first five years the company conducted business in 20 foreign countries spanning several continents in addition to investing in two foreign sales, service and support offices. The company's commitment to internationalisation is further demonstrated by its early and rapid international sales growth and its opening of two additional foreign sales offices in

1999, which is within the first five years of its existence. Based on this data, its industry/sector coupled with high R&D intensity and having only 70 employees, Beta is a small high technology international start-up.

Factors influencing early internationalisation. While the founder of Beta had clear international aspirations for his new company from the outset, international sales were not pursued until 1997. During the first two and one-half years of the company's existence the founder focused on preparing his software products for commercial release and marketing them to the large US domestic market. The founder recognised the necessity of hiring an experienced specialist in international marketing in order to achieve his international objectives and hired such an individual in June 1997. The specialist was made executive vice president, world-wide sales and service, and later promoted to chief operating officer. His background included extensive international business experience in the software industry, where his accomplishments included expanding his previous employer's international business to 45% of total revenue across 40 countries, as well as the formulation of an international strategic alliance with IBM. This new executive was largely responsible for the sale of the company's first international license one-month later and its subsequent transformation into an international company.

The interviewee contends that several factors led to the company being international very early in its existence. The primary driver was the international vision of the founder. The founder had a genuine appreciation for the opportunities offered by expansion into international markets and planned to pursue these markets once the initial products were introduced into the domestic market and an experienced international marketing executive could be retained. Furthermore, the founder strongly desired to be a market leader in his industry, which he believed required international presence. He held that being a market leader necessitated the ability to be the first to enter markets world-wide and consequently cultivated Beta into an international company.

Early internationalisation success factors. The COO interviewed for this study, who was the driving force for the firm's rapid internationalisation, deemed the early internationalisation of the company to be a major strategic and economic success. He stated that all of the company's international growth, revenue and profit goals had been reached or surpassed. While the interviewee expounded on numerous factors accounting for this success, he indicated that the principal success factor was the founder's determination that Beta be an international leader.

The interviewee identified five other characteristics of the founder that played a crucial role in the firm's early internationalisation success. The first two success characteristics have been previously discussed, the founder's international vision for the company and his appreciation for the inherent opportunities associated with expansion into international markets. Closely associated with this was the founder's "affinity for international business" and his open-mindedness regarding internationalisation issues. Finally, the founder's prior career experience, which encompassed international operations, contributed to his international business knowledge and ultimately Beta's early internationalisation success.

The interviewee identified the international experience amongst the senior management of the firm as a key organisational characteristic leading to the success of its internationalisation. He went on to describe himself as the "brick" of the company's internationalisation efforts, basing this self-analogy on his 15 years of international business experience. In terms of product and marketing strategic elements enhancing the firm's early internationalisation success, the interviewee pointed to the flexibility of the company's products. He stated that the products required little customisation and were easily adaptable to other cultures, which facilitated rapid world-wide market expansion and minimised foreign adaptation costs.

When presented with an extensive list of success factors discerned from previous academic studies examining international start-ups, the interviewee rated the following to be the most important to Beta's early internationalisation success: the

founder's resource commitment to international operations, having internationally experienced managers, engaging in strategic alliances and joint ventures, ensuring distribution channel support, having products in a growth industry, having products that ride on an industry change or shift, having standardised products requiring minimal foreign adaptation, lead market success and aggressive entry into broad markets. While Beta's internationalisation process was viewed as a tremendous success by the interviewee, he added that it would have achieved greater success if an international culture had been built into the firm earlier-on.

7.2.3 'GAMMA' CORPORATION (US)

Background and current profile. 'Gamma' is a Boston area computer hardware and software firm providing telecommunications solutions to the computer telephony industry. These solutions include several products designed to enable its OEM customers to develop and implement high-value computer telecommunications systems, which in turn enable applications such as long distance least-cost routing, telephone banking, medical alert services, hotel information systems and transaction card authorisation. The company was founded in 1983 by four individuals who developed the first commercial product incorporating digital signal processor (DSP) technology in the PC-based telephony industry. The firm has continued to be an industry leader since its original innovation and has played an integral role in the development of other key industry technological breakthroughs. Gamma's leading-edge technologies have gained widespread international recognition, as evidenced by its products being installed in more than 40 countries world-wide, and has led to its transformation into an international company.

Although the company has current annual sales of \$80 million, it realised a net loss of \$5.3 million for the most recent financial year. Approximately 23% of this \$80 million revenue was generated by direct international sales, while a further 25% was derived indirectly through its domestic OEM customers' international sales. In addition to its headquarters in the Boston area, the firm's 250 employees are located

throughout 15 offices spanning the world. The company maintains a logistical support factory in Belgium, a manufacturing, R&D, sales and service facility in France and 13 foreign sales offices, with locations including China, Hong Kong, Japan, Singapore, Argentina, Chile, Italy, Spain, Germany and the United Kingdom. Gamma became a publicly traded company in 1994.

Early internationalisation activity. Gamma transacted its first international sale in 1985, two years after its founding. The company steadily increased its international business activity following this transaction and sold its products and services in Canada, Germany, France and the UK during the succeeding three years. These initial country-markets were selected as a result of specific sales leads with companies in these nations. Collectively, international sales accounted for approximately 10% of total firm revenue for the first five years of Gamma's existence.

In support of its expanding European business, the company entered into a non-equity joint venture in 1991 that provided usage of a logistical support factory in Belgium. Then in 1994 it opened a sales office in Hong Kong to facilitate its increasing commerce in the region. Since 1994, the firm has invested in 12 additional foreign sales offices throughout the world as well as in a multifaceted operational facility in France, which provides manufacturing, R&D, sales and service functions. The locations for these facilities were selected based on the perceived need to both establish a presence in and augment the sales efforts in key industry locales world-wide. The interviewee stated that despite the firm's centralised organisational structure, its foreign organisational activities were part of a coordinated firm-wide strategy with shared information and extensive internal electronic communication between the subsidiaries.

While Gamma is presently an international company, it does not explicitly meet the definitional parameters outlined in Chapter 2 to be classed as an international start-up. The interviewee, who was a company co-founder and is currently Senior Vice President International, stated that the founders had an international vision for the

company near its inception. Furthermore, international sales commenced in the company's third year and included business in four foreign countries across two continents in its first five years of existence. However, international sales accounted for only approximately 10% of total firm revenue over the first five years of its international activity, falling short of the study's criterion of 20% (established to indicate substantive international business intensity). While Gamma closely approximates the defining characteristics of an international start-up and subsequently adds value to the study, it is more accurately classed as a small high technology early-internationalised firm, based on its early internationalisation history, industry/sector with evidence of ongoing R&D activity and having only 20 employees at the time of its initial international activity.

Factors influencing early internationalisation. Two influential factors led to the company's early internationalisation. The first was the international nature of the firm's industry. Due to the competitive environment of the computer telephony industry, the company felt compelled to engage in international business early in its existence in order to compete and survive. The second factor was the company's domestic OEM customers' resale of its products internationally. This in turn led to foreign consulting contracts for Gamma as well as world-wide company recognition, ultimately leading to increased international business activity.

The interviewee identified the following factors as playing a very important role in the firm's decision to internationalise soon after its inception: the founders' international experience, the identification of specific international opportunities, the desire to exploit a proprietary technology or process internationally, to provide additional market opportunities, the international and competitive nature of the firm's industry, the need for the ability to respond to competitor initiatives world-wide, to pre-empt competitors, pressure exerted by the firm's customers and advances in global communications, information technology and transportation, which facilitated international operations. These factors were identified when presented with a list of factors found in previous academic studies to influence early internationalisation.

Early internationalisation success factors. The interviewee considered the early internationalisation of the firm to be a success, both strategically and economically. He pointed to the founders' previous international business experience and the products' design for international sales as key initial internationalisation success factors. However, he postulated that the overriding success factor for the firm was the founders' "respect for technology in other countries". He went on to explain the importance of not regarding foreign technology as being inferior, since the assumption that US technology is superior can lead to catastrophic product and marketing blunders and misfortunes.

When presented with a list of success factors noted in prior academic studies, the interviewee identified the following as being the most important to the firm's early internationalisation success: the international vision of the founders, the previous start-up experience of the founders, having strong international business and social networks, obtaining sufficient working capital, focus on income generation and cash flow, having a unique intangible asset, having a sophisticated internal communications network, having differentiated products, premium pricing, having products in a growth industry, having unique and innovative products, having high quality products, operating in international niche markets, pre-emptive technology or marketing, standardised products requiring minimal foreign adaptation, follow-on products from the same technology, having linked product and service extensions and capitalising on the firm's learning experiences.

7.2.4 'DELTA' LIMITED (UK)

Background and current profile. 'Delta' is a Glasgow area computer software firm providing management solutions to the telecommunications industry. More specifically, the company develops complex software systems designed to enhance the management of broadband telecommunications networks. Delta was founded in 1992 by three individuals, who all presently remain with the company, with extensive technical and management backgrounds in the computer and

telecommunications industries. They transformed their fledgling company into a world leader of network management system solutions over a period of only a few years. The company's technical expertise and marketing skills are perhaps best exemplified by its software being utilised by well-known telecommunications companies world-wide, such as AT&T, Bell Atlantic, MCI, British Telecom, Deutsche Telecom and Swisscom. Delta is both ISO9001 and ISO9000-3 (TickIT) certified.

Although Delta currently has an annual turnover of approximately £8 million, it remains marginally unprofitable. 80% of its revenue is obtained from the licensing of its software, while the other 20% is generated from consulting services. The company's focus on international business is clearly manifested by nearly 100% of its revenue being derived from international sales and consulting since its inception. The company employs 104 people throughout its Glasgow area headquarters and 5 offices in the United States. The United States offices perform sales, service and support functions and are located in Boston, Denver, San Jose, Columbus and Raleigh. All of the company's overseas staff is American. Delta maintains a high level of R&D intensity, as evidenced by 65% of its employees and 60% of its revenue being allocated to R&D activities.

Early internationalisation activity. Delta engaged exclusively in international business activity from the outset. All of the company's direct customers are located in the United States, where it licenses its software on an OEM basis. Indirectly, through its United States customers, it has conducted consulting services in an additional six countries. These countries are Sweden, Italy, Spain, Switzerland, Germany and its home nation, the United Kingdom. Delta transacted business in each of these nations in the first five years of its existence.

Delta established five sales, service and support offices in the United States between 1997-1998. The company's chief executive officer (CEO)/co-founder, who was interviewed for this study, indicated that customer circumstances led to the opening of these offices. The decision to set up the offices was based on the perceived needs

to establish a presence in key United States markets in order to enhance sales efforts and to physically locate near important customers in order to facilitate the delivery of high calibre service. The company's foreign offices are part of a firm-wide coordinated strategy with shared information and open discussion, achieved in part by computer groupware communications.

Delta can definitively be classified as an international start-up, based on the definitional criteria stipulated in Chapter 2. Its founders had a profound international vision for the company from the beginning. As previously indicated, virtually all of the company's revenue has been attributable to international sales and consulting services since its inception. In its first five years the company conducted business in six foreign countries across two continents. Moreover, the company has demonstrated early globalisation intent by the establishment of foreign value chain activity (i.e. foreign-based sales, service and support functions). Based on these attributes, its industry/sector coupled with a high degree of R&D intensity and having fewer than 100 employees during its first five years of existence, Delta can clearly be labelled a small high technology international start-up.

Factors influencing early internationalisation. The origin of the founders' distinctive international vision for Delta can be traced back to their previous work experience in the United States. They not only gained industry knowledge from this experience, but valuable business contacts and customer knowledge as well. This accumulated industry and market knowledge ultimately led to the United States being selected as Delta's initial target market. Three additional reasons for the selection of the United States as the company's initial target market were given. First, it represented a large and key market for the company's industry. Second, its common language and culture greatly eased the international business process, particularly in light of the company's lack of experience. And third, the founders recognised that the world-wide relationships and international sales presence of their prospective United States customers could subsequently lead to unparalleled opportunities for the young company.

Aside from country-specific explanations, the interviewee identified several industry factors as having played an integral role in the firm's early internationalisation. The founders believed that the international and competitive nature of the company's industry necessitated an international strategy from the beginning in order to survive and prosper. Furthermore, very short product life cycles likewise necessitated an international strategy in order to achieve profitability. The interviewee stated that industry characteristics led the founders to conclude that the company must "address the global market from day one", and hence transformed Delta into a distinctly international company.

Early internationalisation success factors. The interviewee deemed the early internationalisation of the company to be a success, both strategically and, in the longer term, economically. While he identified several factors as being key to the company's success, he believed that the most important was getting its first large international customer on a multiple year/site basis. He went on to explain that this achievement of securing its first sizeable international customer served as a "catalyst to launch the firm from its business plan".

The interviewee identified the determination and tenacity of the founders as being a crucial success factor during the firm's early internationalisation. He emphasised the necessity of combating disillusionment, which he contends is inevitably encountered when a young, inexperienced and resource-constrained firm internationalises. In terms of organisational characteristics that facilitated the company's internationalisation success, the interviewee pointed to the firm's ambitious and goal driven internal behaviour, customer-focused staff and flat organisational structure. He stressed the importance of the character of the people in the organisation, since he contends that they build the culture of the company. The product and marketing strategy characteristics that led to Delta's internationalisation success included having a clear business development plan, customer-driven product design and flexibility due to short product life cycles. Finally, when asked what additional factors could have enhanced the success of the firm if they had been implemented, the interviewee stated that access to people who had prior international experience

would have greatly eased their internationalisation process and made them more successful at an earlier stage.

7.2.5 'EPSILON' LIMITED (UK)

Background and current profile. 'Epsilon' is an Edinburgh-based computer software firm providing person-to-person question and answer infrastructures for company Intranets as well as the Internet. Its software brings people and information together, creating an environment whereby users can ask questions, locate experts and share knowledge. The company was formed in 1994 by three founders, two of which provided the technical expertise and focused on product development, while the final founder contributed to business development and organisation management. The latter co-founder is the current Chief Executive of the company and the interviewee for this case study. In its short history, the firm has evolved into a leading international provider of company knowledge management software.

Although Epsilon's current annual sales are approximately £1.5 million, the firm remains unprofitable. While sales have increased substantially each year, the firm continues to experience losses due to expenses related to product development and international marketing. The company, which received nearly £15 million in venture capital funding from several investors, expects to achieve profitability within two years. Approximately 50% of Epsilon's revenue is derived from product sales and the other 50% from consulting services. 75% of the firm's total revenue is attributable to international sales and consulting. The company employs 40 people in the UK and US. In addition to its software development operation and European headquarters in Edinburgh, it maintains a US headquarters in Boston as well as sales offices in San Jose (Silicon Valley area) and London. 60% of its employees are involved in R&D activities. Whereas the company was privately held at the time of the interview, it was floated on the London Stock Exchange in 2000.

Early internationalisation activity. Epsilon developed and released its first commercial product in 1997. International sales commenced that same year and have accounted for approximately 75% of total firm revenue ever since. In its first five years of existence, the firm conducted business in the United States, Canada, Italy and parts of Asia. Epsilon's initial and principal target market was the US, with the UK domestic market being viewed as an opportunity to pursue at a later date. While the interviewee stated that the UK market was "on our doorstep and could not be ignored", it did not transact business domestically until it was approached by a UK customer. The US was chosen as the firm's primary market due to the large size of the country's technical market. Coupled with this was the high level of technological acceptance in the US as well as its advanced stage of technology. The interviewee contended that the UK lagged the US in terms of knowledge management technology by 6-12 months.

In support of its marketing focus in the US, Epsilon established a sales and support office in the Silicon Valley area of California in 1997. This was followed by the 1999 opening of a US headquarters in Boston, where administrative matters were dealt with in addition to providing sales and support functions. Each office was staffed with six personnel. The principal objective of the early establishment of organisational activities in the US was to facilitate the development of business in the firm's primary target market. It chose San Jose and Boston as the sites for its offices based on their being the two foremost technological hubs in the US coupled with the perceived need to partner and sell in these two key locales. These foreign organisational activities are part of a co-ordinated firm-wide strategy, although to a lesser degree at first, which is maintained through extensive use of video conferencing as well as quarterly meetings in Scotland.

Epsilon can unquestionably be classed as an international start-up, based on the study's parameters. The founders had a very clear international vision for the firm from the outset. International sales were the overriding focus and commenced in the same year as its first commercial product release. The company conducted business in more than four countries spanning three continents in its first five years.

International sales accounted for approximately 75% of total firm revenue for each year of its international activity. Furthermore, the firm demonstrated its international commitment by the establishment of foreign-based organisational activities early in its existence. Based on Epsilon's internationalisation history, industry sector coupled with a high level of R&D intensity and having only 15 employees at the time of its initial international activity, the firm clearly meets the study's criteria to be classed as a small high technology international start-up.

Factors influencing early internationalisation. The interviewee identified several factors as being influential with regards to the firm's early internationalisation. He contended that as a technology company it was important to immediately pursue large markets with high levels of technological adoption in order to survive and grow. Hence, the firm concentrated its marketing efforts in the US, as well as subsequently in other leading nations, from the beginning. The interviewee stated that the early international focus was also influenced by the perceived needs to get to key markets quickly, be at the centre of international technology and to compete with international competitors. Finally, the firm's early internationalisation was influenced by the founders' belief that it was easier to build an international company with an international culture while it was small and young.

When presented with a list of factors found by previous empirical studies to influence early internationalisation, the interviewee identified the following as being the most important to the firm's decision to be international from the beginning: the international vision of the founders, the small UK domestic market, the international and competitive nature of the firm's industry, the need for the ability to respond to competitor initiatives world-wide and to minimise the complications of later shifting to international markets following a period of exclusive domestic focus. In light of these factors and objectives, Epsilon's founders created a markedly international firm from the outset.

Early internationalisation success factors. The founder interviewed for this case study considered Epsilon's early internationalisation to be a strategic success based

on the achievement of its objective of establishing a recognised US presence. However, he rated the economic success to be limited to sales growth rather than profitability, pointing out that the company was still quite young. The interviewee identified the overriding success factor for the firm as its ability to maintain access to capital and remain well capitalised. As previously indicated in this case study, the firm has successfully attracted nearly £15 million in venture capital funding over its short lifetime.

The interviewee believed that the founders' "blind ambition", strong drive to succeed and focus on the achievement of small-step objectives were key factors in the firm's success. The organisational factors leading to the success of the firm included the recruitment and retention of top technical and marketing staff as well as the inclusion of a professional operations manager in the organisation who improved the company's decision making process as well as addressed ongoing personnel issues. In terms of product and marketing strategy factors leading to the firm's success, the interviewee identified the focus on its core technology, appearing as a US company and the recognition of technical and business differences between the UK and US as being of particular importance. Finally and somewhat surprisingly, when asked what additional factors could have enhanced the success of the firm if they had been implemented, the interviewee stated that the firm should have raised capital in Boston or Silicon Valley from the start and located the entire organisation there in order to be more successful.

7.2.6 'ZETA' LIMITED (UK)

Background and current profile. 'Zeta' is an Edinburgh area electronics firm providing leading edge networked video solutions to OEM manufacturers world-wide. The company's applications enable real time full motion video to be transmitted over local and wide area networks for uses such as CCTV surveillance, digital VCR, motion detection systems, video-conferencing and red-light and speed camera traffic enforcement. The firm was founded in 1994 by a single founder, who

is the Chief Executive Officer of the firm and the interviewee for this case study. In its short lifetime, Zeta has developed into one of the world's leading OEM suppliers in its industry through partnerships with prominent manufacturers in the US, Japan and Europe.

Although Zeta's sales are increasing and the firm's current annual revenue is approximately £750,000, it remains unprofitable. 100% of this revenue is derived from OEM sales, with no direct end-user sales or consulting income. 95% of total firm revenue is attributable to international sales. In addition to its headquarters in the Edinburgh area, the firm maintains a sales office in Stow, Massachusetts in the US, which is staffed by two individuals. The total number of company employees, including those in the US, is 30. The company has a high level of R&D intensity, as evidenced by two-thirds of its workforce being engaged in R&D activity.

Early internationalisation activity. Zeta achieved its first international sale in 1996, shortly after its initial product release. International sales have been the focus of the firm from the beginning and have represented approximately 95% of total firm sales for each of its years of business. In its first five years the company has sold its products in five foreign countries spanning three continents. These foreign markets are the United States, Japan, France, Germany and Spain. Of these markets, the US and Japan represent the firm's main markets, while the European markets are regarded as being of secondary importance. The US was selected as an initial country market since it represented a large and leading technological market for the firm and the founder recognised the necessity of targeting it. Japan was selected as an initial target market based upon it being the location of the world's major camera manufacturers. The European markets, including the UK, were deemed to be of lesser importance but nevertheless worthwhile to pursue.

Zeta opened a sales office in Stow, Massachusetts in 1996. The decision to establish the office in Stow was based on its proximity to numerous prospective manufacturing customers, its relatively close geographic distance from Scotland enabling quick response and its desire to have a local presence. However, the

overriding objective for establishing the foreign-based office was to create the perception of a US company. The founder/CEO had a strong desire to be perceived as a US company since he felt that being seen as a small Scottish start-up projected a negative image. The firm planned to open a sales and support office in Japan and another on the west coast of the US by early 2000 in order to further enhance its business in its two primary markets.

Zeta can clearly be classed as an international start-up, based on the criteria previously set forth in this thesis. The founder had a strong international vision for the firm from the beginning. The company sold its products in five foreign countries spanning three continents in its first five years of existence. International sales accounted for 95% of total firm sales over this same time frame. Furthermore, the company demonstrated its commitment to international activity by the early establishment of foreign-based organisational activities. Based on its internationalisation history, industry/sector coupled with a high degree of R&D intensity and having only five employees at the time of its initial international activity, Zeta readily meets the study's parameters for classification as a small high technology international start-up.

Factors influencing early internationalisation. The interviewee identified three primary factors that influenced the firm's distinctive early internationalisation. The first was the relatively small size of the UK domestic market, which predisposed the firm to target larger markets abroad. The second factor was the international nature of the firm's industry coupled with its perceived need to conduct business in key foreign markets from the beginning in order to compete and prosper. The final factor influencing Zeta's early internationalisation was its recognition of the necessity to achieve a US standard for its products in order to succeed, thereby requiring US business partnering.

When presented with a list of factors found by prior academic studies to influence early internationalisation, the interviewee identified the following as being of great importance to Zeta's early internationalisation: the international vision of the

founder, the desire to exploit a proprietary technology internationally, to provide additional market opportunities, having a small domestic market, the international and competitive nature of the firm's industry, to pre-empt competitors and the increased homogeneity of international markets. These factors along with those identified in the previous paragraph were the principal factors leading Zeta to be international in nature from inception.

Early internationalisation success factors. The founder interviewed for this case study rated the firm's early internationalisation to be relatively unsuccessful initially, but with greater success, both strategically and economically, after the first few years. When asked to identify the firm's overall success factors, the interviewee pointed to the quality of its personnel, support for its people and the regarding of itself as a US company as being the most important. The interviewee went on to explain that the company's main mistakes in the past, which impacted its success, had been people related.

The interviewee contended that the founder related factors that led to the success of the firm were his strategic vision, maturation through prior experience, focus on obtaining sufficient funding and entrepreneurial mindset gained from his father's past entrepreneurial endeavours. He also identified the importance of a good management team as a key organisation success factor and having a clear view of the market as a key product and marketing strategy success factor. He elaborated on this last point by explaining that the firm's analysis of its industry led it to target the OEM market rather than end-users, which ultimately proved to be a successful strategy for the firm. Finally, when asked to identify any additional factors that could have enhanced the success of the firm's internationalisation if they had been implemented, the interviewee stated that "believing that it can be done" and overcoming a negative culture, as well as having an experienced international business mentor, could have greatly contributed to Zeta's success.

7.3 CONCLUSION

The chapter delineated the study's qualitative findings pertaining to its four research questions. Findings stemming from 12 in-depth interviews with founders and top managers of UK and US early internationalising high technology firms were presented and discussed in Section 7.1. These qualitative findings led to the identification of new factors related to the research questions and the confirmation of other factors that were previously identified in the literature. All of these factors were subsequently included in the quantitative phase of the study and tested for statistical significance in the population.

The interviews also served as the basis for the development of case studies, which were presented in Section 7.2. The case studies provided a richer understanding of the factors identified in the interviews by describing the factors in more depth as well as providing a contextual foundation. Furthermore, the case studies provided illustrations of the formative years of international start-ups, thereby enhancing the understanding of their distinctive early internationalisation. The research question factors described in the case studies directly correspond with the interview findings described in the first part of the chapter, inasmuch as the case study firms were included amongst the interviewed firms. Since the interview findings were succinctly described earlier in the chapter, supplementary commentary on these case study factors would be superfluous and is therefore not incorporated. However, one overall observation emanating from the case studies that warrants special acknowledgement and emphasis is the tremendous impact of the founders on the early internationalisation and success of international start-ups.

CHAPTER 8

DESCRIPTIVE AND UNIVARIATE/BIVARIATE DATA ANALYSIS FINDINGS

INTRODUCTION

This chapter represents the first of two chapters delineating the quantitative findings of the postal survey. Chapter 8 focuses on descriptive and univariate/bivariate data analysis findings, addressing Research Questions/Propositions 2-4, while Chapter 9 presents multivariate data analysis findings and addresses Research Question/Proposition 1. Research Question/Proposition 1 is presented in a separate chapter due to both its prominence as the primary research question of this thesis and the voluminous nature of the multivariate analysis. Details regarding the postal survey's sampling frame, questionnaire construction and response rates were previously outlined in the Research Methodology chapter (see Chapter 6).

The chapter commences with a descriptive analysis of the survey respondents, rendering idiosyncratic profiles of the responding UK and US firms. The analysis encompasses numerous general characteristics of the firms, such as their current age, industry sector, and R&D allocations, as well as early internationalisation characteristics, such as their age at the time of their first international sale, initial country markets and foreign market entry methods. The objective of the analysis is not only to provide profiles of the responding firms, but also to construct a platform enabling comparative analysis of the UK and US firms.

The second part of the chapter utilises univariate and bivariate data analysis techniques to answer Research Questions 2-4 and to determine the support of the findings for Propositions 2-4. Accordingly, one-sample and two-sample *t*-tests were conducted and analysed in order to determine key factors influencing small high technology start-ups to be international at or near inception, as well as factors

influencing both their selection of initial country markets and their early establishment of foreign organisational activities (e.g. foreign-based sales or service offices). The research questions are restated below.

Research Question 2

- a) *What are the key factors influencing small high technology start-ups to be international at or near inception?*
- b) *What differences exist, if any, between these factors for UK and US start-ups?*

Research Question 3

- a) *What are the principal factors influencing the selection of initial country markets for UK and US small high technology international start-ups?*
- b) *What differences exist, if any, between these factors for UK and US international start-ups?*

Research Question 4

What are the primary factors influencing small high technology international start-ups to establish organisational activities (e.g. sales or service offices) in foreign countries in the early years of their existence?

8.1 PROFILE OF RESPONDING FIRMS

As was detailed in the Research Methodology chapter (see Section 6.6.3), 102 UK and 89 US usable responses were received in the postal survey. Of these, 49 UK and 45 US firms (48.0% and 50.6% respectively) met the definitional criteria to be classed as international start-ups, as defined in Chapter 2. The following profile was noted for the individuals completing the usable questionnaires. While all of the individuals were company officers, 72.5% of the UK questionnaires and 92% of the US questionnaires were completed by the top executives of the firms (i.e. managing director, chief executive officer, president or chairman). 78.4% of the UK

responding individuals and 78.8% of the US responding individuals were founders of their companies. Furthermore, 98% of the UK and 100% of the US responding individuals had direct knowledge of the founding conditions and early characteristics of their companies, which was paramount to the accurate reporting of the required historical data. The 2 UK respondents lacking direct knowledge were included in the analysis based on their extensive, demonstrated secondary knowledge of the founding conditions and characteristics of their firms. In light of these characteristics, the quality of the responding individuals and subsequent data reported was deemed to be highly satisfactory.

Table 8.1 provides an illustration of several company characteristics of the responding UK and US firms, including UK and US international start-ups. As can be seen from the table, the mean current age of the firms, 16.2 years for the UK firms and 12.5 years for the US firms, is fairly young, which facilitates the accurate recounting of the historical data (i.e. founding years) required in the survey. Furthermore, the mean current age of the UK and US international start-ups was even younger (13.8 and 11.9 years respectively). Most of the firms were independent start-ups (65.7% UK and 82.0% US) rather than spin-offs from other companies, spin-offs from universities or other founding methods such as management buy-outs, which is desirable since this study was designed to focus primarily on independent, entrepreneurial-type start-ups. The firms comprising the international start-up samples were likewise largely independent (63.3% UK and 80% US).

Characteristics	All Responding UK Firms (n=102)	UK International Start-ups (n=49)	All Responding US Firms (n=89)	US International Start-ups (n=45)
Current Age (mean years)	16.2	13.8	12.5	11.9
Type of Founding (% of firms)				
Independent	65.7	63.3	82.0	80.0
Spin-off from Company	24.5	20.4	15.7	15.6
Spin-off from University	2.9	4.1	3.4	4.4
Other	7.8	12.2	1.1	0.0
Industry Sector (% of firms)				
Computer Software	27.5	24.5	53.9	66.7
Computer Hardware	11.8	12.2	27.0	24.4
Electronics	47.1	46.9	19.1	8.9
Other	13.7	16.3	0.0	0.0
Revenue Sources (mean %)				
Product Sales	80.9	86.4	81.5	81.1
Professional Services	14.6	9.3	15.2	14.1
Other	3.7	3.0	4.5	6.6
% Employees R&D (mean)	15.4	18.5	24.3	24.9
% Turnover R&D (mean)	11.7	12.7	31.5	28.6

Table 8.1: Profile of Responding Firms

Table 8.1 includes an illustration of the industry sectors of the responding firms. While many firms crossed industry sectors, for example a company producing both computer hardware and software, the respondents were asked to identify their primary industry sector. Nearly half of the UK sample (47.1%) was best categorised as being in the high technology electronics sector, with fewer being in computer software, computer hardware or other related high technology industry sectors (27.5%, 11.8% and 13.7% respectively). Conversely, the US sample was largely in the computer software sector (53.9%), followed by computer hardware and electronics (27.0% and 19.1% respectively). This UK/US sample variation was more pronounced with the international start-ups, with 66.7% of the US international start-

ups being in the computer software sector. This substantial difference between the UK and US samples reflects both the vastness of the computer software industry in the US, especially amongst international start-ups, as well as sampling frame differences, as described in Chapter 6. While the subsequent study findings are therefore biased towards specific sectors, this was expected and the impact on the overall findings was minimised by the cross-sector nature of the study.

The turnover for the firms in the study was largely attributable to product sales rather than professional services or other income sources such as after-sale support, as illustrated in Table 8.1. Over 80% of the firms' revenue stemmed from product sales (80.9% for UK firms and 81.5% for US firms). These mean percentages were very similar for the international start-ups (86.4% UK and 81.1% US). While nearly all of the firms in the study were primarily product producers rather than service providers, many received a lesser amount of service related income in addition to product sales revenue. For example, a typical firm might receive 80% of its income from product sales and 20% from consulting services. The high proportion of product producers relative to service providers was desirable since the study was designed to focus primarily on manufacturing firms.

As can be seen in Table 8.1, the firms in the study had a high degree of research and development (R&D) intensity, as measured by the percentages of both employees and revenue allocated to these endeavours. The mean percentage of employees (full-time equivalent) engaged in R&D activities was 15.4% for the UK firms and 24.3% for the US firms. These figures were even higher for the international start-ups (18.5% UK and 24.9% US). The mean percentage of the firms' turnover spent on R&D activities was 11.7% for the UK firms and 31.5% for the US firms. The percentages for the international start-ups were similar (12.7% UK and 28.6% US). The high levels of R&D intensity noted, as measured by these two indicators, are indicative of the high technology nature of the study's industry sectors. While the US firms in the study were found to have a much higher allocation of personnel and funds for R&D endeavours than the UK firms, this may be partly attributable to the

large proportion of US software firms in the sample, which is an industry sector requiring continuous innovation and hence extensive R&D activity.

Table 8.2 illustrates several internationalisation-related characteristics of the responding firms. The firms in the study clearly displayed early internationalisation activity, as evidenced by their mean age at the time of their first international sale being only 1.9 years for the UK firms and 1.4 years for the US firms. Among the international start-ups, the mean ages were younger still, 0.2 years for the UK firms and 0.8 years for the US firms. However, it should be noted again that the sampling frame stipulated that all firms in the study must have engaged in international business activity, although the age of the firms at the time of their initial international activity was not known (see Chapter 6). Furthermore, the mean number of employees at the time of their first international sale was fewer than 29, which is consistent with this study's focus on small firms. As was detailed in Chapter 2, this study utilised the definitional parameter of having fewer than 100 employees at the time of initial international activity as the criterion for a firm to be classed as 'small'.

Characteristics	All Responding UK Firms (n=102)	UK International Start-ups (n=49)	All Responding US Firms (n=89)	US International Start-ups (n=45)
Age at First International Sale (mean years)	1.9	0.2	1.4	0.8
Number of Employees at First International Sale (mean)	22.7	19.2	28.4	18.7
International Vision at or within One Year of Inception (% of firms)	75.2	100	76.4	100
Number of Countries Entered during First Five Years of International Activity (mean)	10.4	15.2	15.3	20.9
Number of Continents Entered during First Five Years of International Activity (mean)	3.0	3.6	3.5	4.3
Average % Turnover International for First Five Years of International Activity (mean)	36.9	57.4	28.2	35.8

Table 8.2: Internationalisation Profile of Responding Firms

75.2% of the UK firms and 76.4% of the US firms in the study stated that the company founders had an international vision for their firms at or within one year of inception, as shown in Table 8.2. International vision was defined in the questionnaire as having “international outlook and aspirations”. All of the international start-ups in the study indicated that the founders had an international vision for their firms at or within one year of inception, since this was one of the study’s definitional parameters to be classed as international start-ups.

As exhibited in Table 8.2, the mean number of countries that the firms in the study sold their products and/or services in during the first five years of their international activity was quite high, 10.4 for the UK firms and 15.3 for the US firms. The numbers were higher still for the international start-ups, 15.2 for the UK firms and

20.9 for the US firms. The mean number of continents in which the firms in the study sold their products and/or services in during the first five years of their international activity was 3.0 for the UK firms and 3.5 for the US firms (3.6 and 4.3 for the UK and US international start-ups respectively). These country and continent statistics are surprisingly high and indicative of the exceptional early-internationalisation activity of the firms in the study. Furthermore, it is somewhat surprising that the US firms in the study exhibited a markedly higher degree of early internationalisation, as measured by these two indicators, than the UK firms in light of the vast differences between the size of their domestic markets and geographic distance from other nations. A partial explanation for this is the high proportion of computer software firms in the US sample relative to the UK sample, since internationalisation in the computer software industry has been found to be very rapid (see for example Bell, 1995; Coviello and Munro, 1997). It should be noted that the study's definitional criteria for firms to be classed as international start-ups require that they conduct business in at least four foreign countries, of which at least one must be in a different continent than the home country, within five years of founding. Accordingly, all of the firms classed as international start-ups in this study were closely examined for adherence to these criteria.

The final characteristic illustrated in Table 8.2 pertains to the average annual percentage of company turnover attributable to international sales over the first five years of the firm's international activity. The mean for the UK firms was 36.9% and for the US firms 28.2%. The figures for the international start-ups (57.4% UK and 35.8% US) were much higher, as was expected due to the intensity of their international activity. It should be noted that one of the definitional parameters for a firm to be classed as an international start-up in this study was for international sales to represent a minimum of 20% of total firm revenue over the first five years of its international activity. Interestingly, the percentages for the UK firms were far higher than those for the US firms, despite conducting business in fewer countries, as described in the previous paragraph. A likely explanation for this is the relatively small size of the UK domestic market as compared to the vast US domestic market, with its inherent opportunities to conduct substantial national business.

Figure 8.1 illustrates the relative frequencies of the first five foreign markets entered by the UK and US firms in the study. The first five foreign markets entered by the UK firms were: US (55% of firms), France (51%), Germany (49%), Netherlands (33%) and Sweden (24%). The first five for the US firms were: UK (78% of firms), Germany (63%), France (43%), Canada (38%) and Japan (38%). The most salient observation regarding these statistics is the UK and US being each other's most frequent initial target market by the firms in the study.

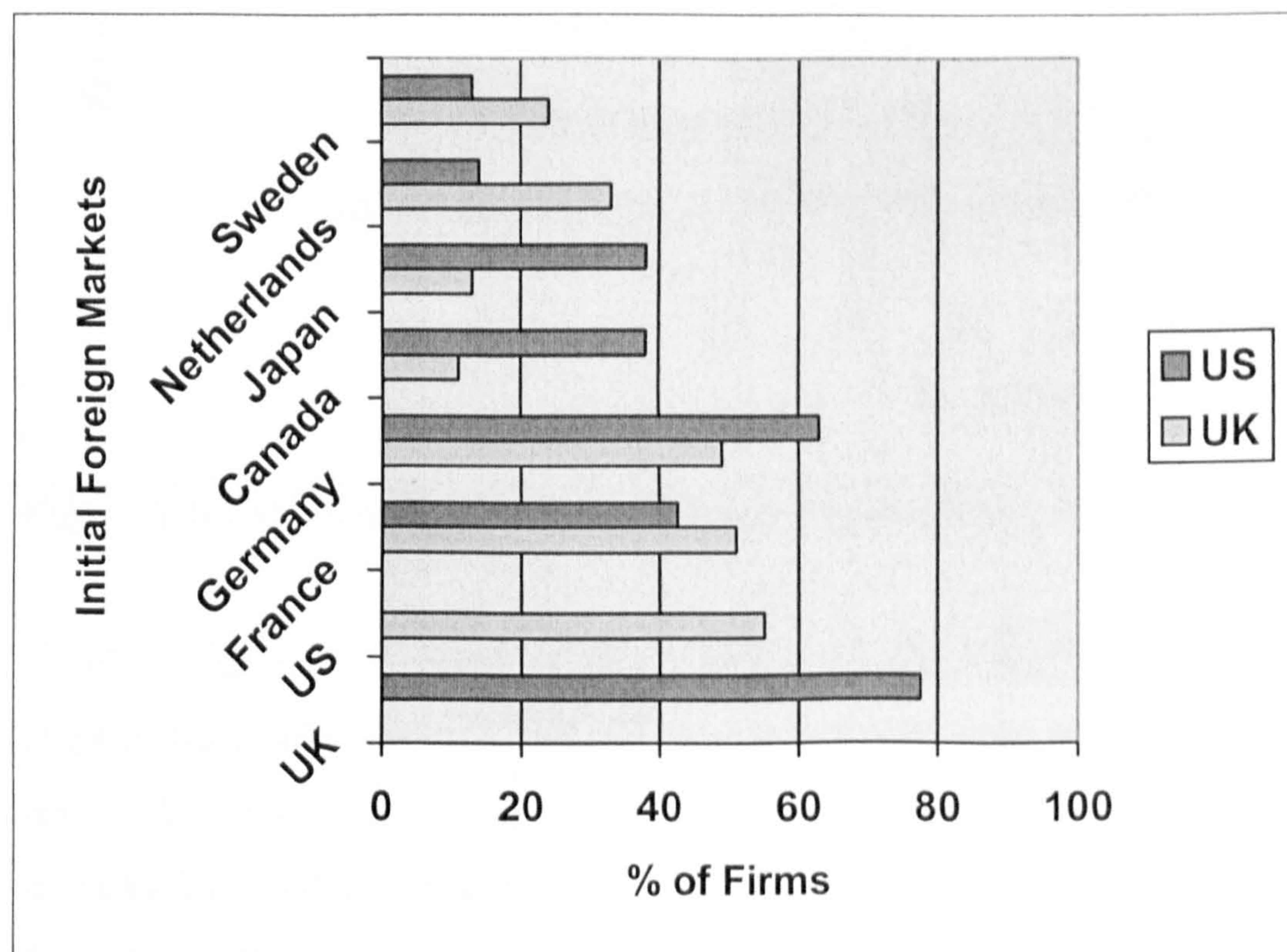


Figure 8.1: First Five Foreign Markets Entered by UK and US Responding Firms

Figure 8.2 displays the relative frequencies of the foreign market entry modes utilised by the study's UK and US international start-ups. The most common entry methods for the UK international start-ups were: indirect exporting (90% of firms), direct exporting (84%), strategic alliances (51%), wholly owned subsidiaries (49%), licensing (22%) and equity joint ventures (16%). The order for the US international start-ups was: indirect exporting (93% of firms), direct exporting (76%), wholly owned subsidiaries (51%), strategic alliances (42%), licensing (31%) and equity joint

ventures (13%). It is readily apparent by reviewing Figure 8.2 that few differences exist between the foreign market entry modes utilised by the UK and US international start-ups in the study.

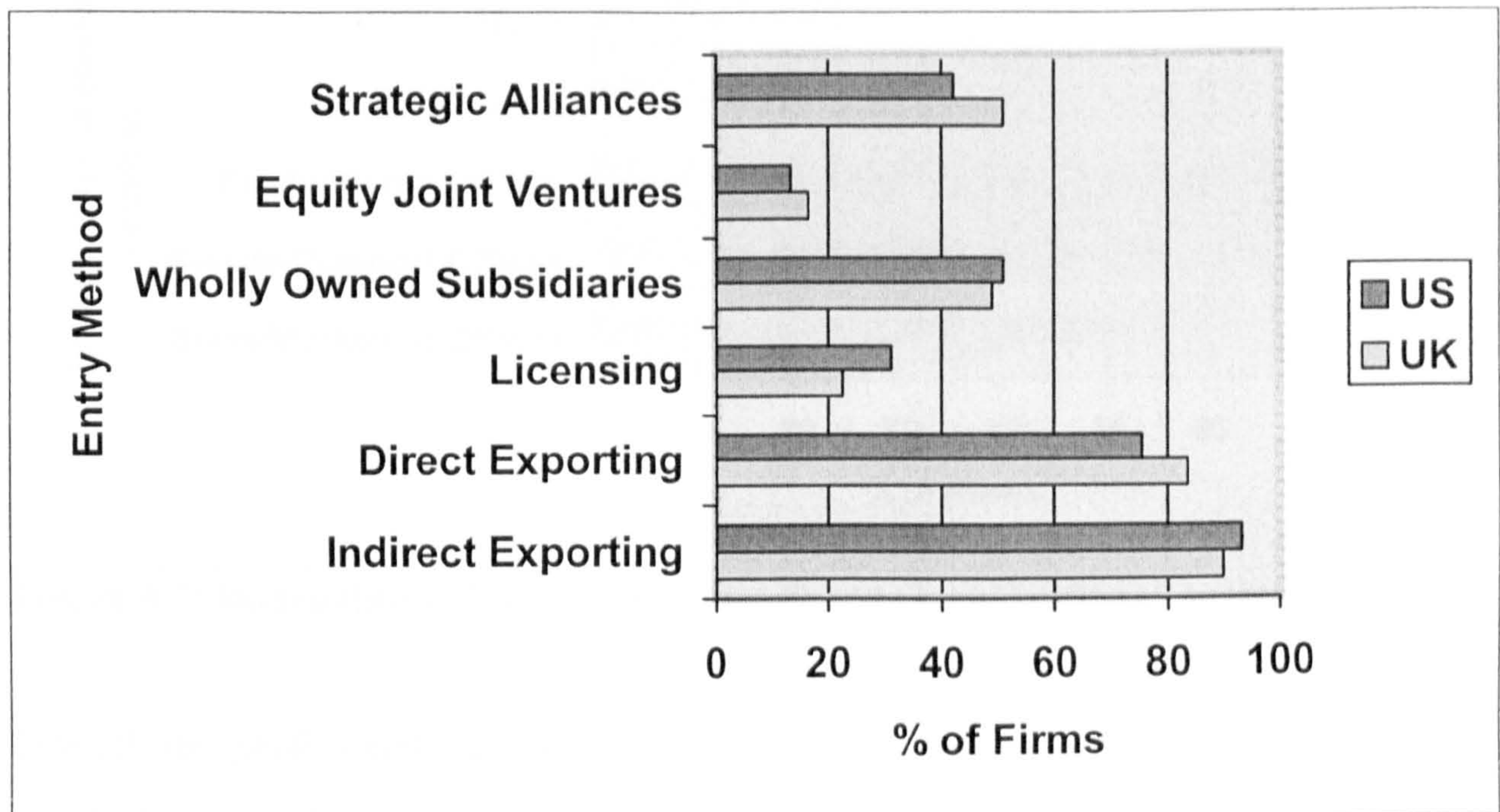


Figure 8.2: International Start-up Foreign Market Entry Methods

Finally, Figure 8.3 displays the relative frequencies of the foreign-based organisational activities (i.e. foreign value chain activities) of the international start-ups in the study. 40.8% of the UK international start-ups and 53.3% of the US international start-ups established foreign-based organisational activities during the first five years of their international activity. The relative frequencies for the UK international start-ups were: sales and marketing offices 38.8% of all firms, service and after-sale support offices 24.5% and production facilities 6.1%. None of the UK firms in the sample had established foreign-based R&D units in the first five years of their international activity. The relative frequencies for the US international start-ups were: sales and marketing offices 51.1% of all firms, service and after-sale support offices 35.6%, R&D units 20.0% and production facilities 11.1%. It is clear from Figure 8.3 that the US international start-ups more frequently established foreign-based organisational activities than the UK international start-ups. One likely explanation for this is that the geographic distance of the US firms from their foreign

markets, as opposed to the UK firms, created a greater need to establish a regional/local presence in order to facilitate their international business endeavours.

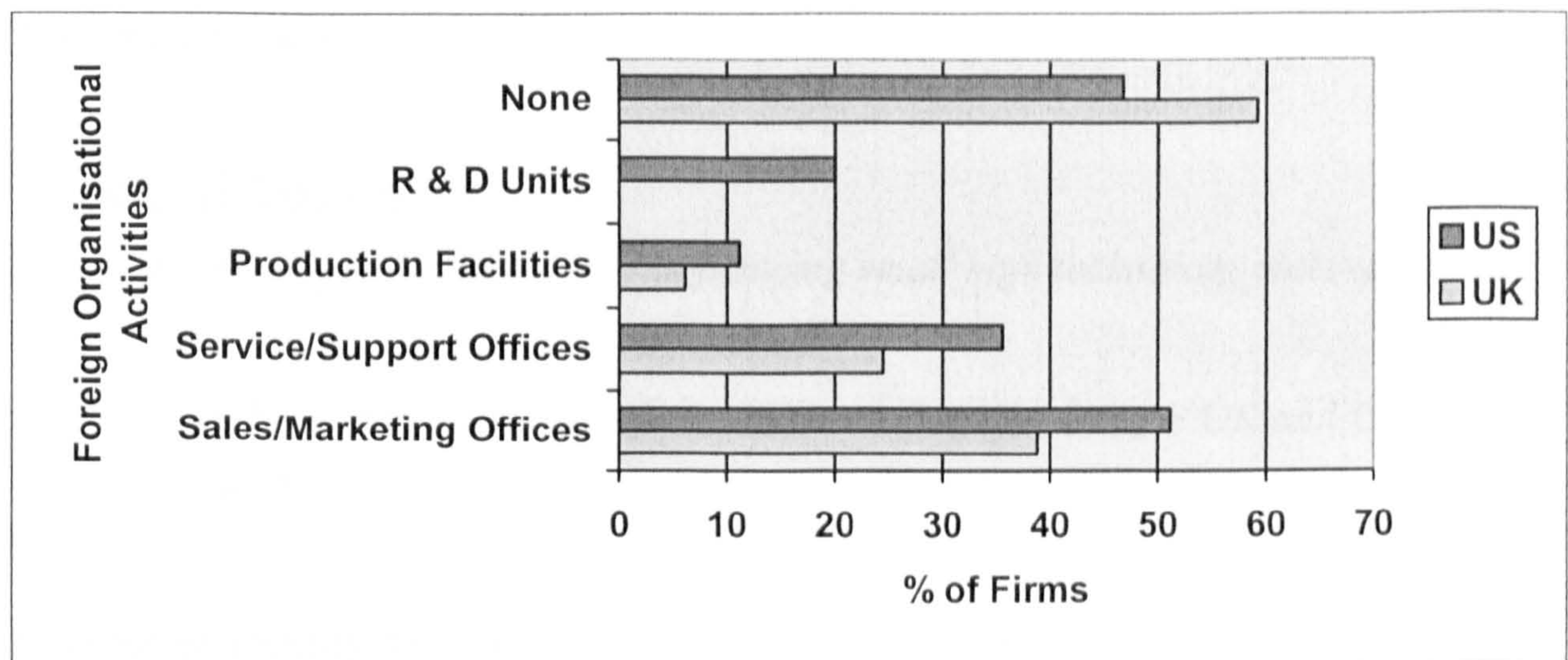


Figure 8.3: International Start-up Foreign-Based Organisational Activities

Overall, the profile and quality of the responding firms in the survey was highly satisfactory. The responding firms can generally be described as young, independent, small, manufacturing, high technology firms that demonstrated early and extensive internationalisation, with 49 UK and 45 US firms meeting the study's definitional parameters (as set forth in Chapter 2) to be classed as international start-ups. The objective of this research project was to examine several dimensions of UK and US small high technology international start-ups. Based on the profiles constructed in this section and the ensuing analysis, it is clear that a sufficient quantity of UK and US small high technology international start-ups was successfully attained, thereby facilitating the subsequent analysis of the study's research questions. Section 8.2 marks the beginning of this analysis, commencing with Research Question 2.

8.2 FACTORS INFLUENCING SMALL HIGH TECHNOLOGY START-UPS TO BE INTERNATIONAL AT OR NEAR INCEPTION

This section addresses Research Question 2, utilising univariate and bivariate data analysis techniques to answer the two-part question. While the data analysis findings

will be illustrated in this section, a discussion and evaluation of the findings will be presented in the ensuing Discussion and Conclusions section (Section 8.5), as will the determination of the support of the findings for Proposition 2. Research Question 2 is restated below.

Research Question 2

- a) *What are the key factors influencing small high technology start-ups to be international at or near inception?*
- b) *What differences exist, if any, between these factors for UK and US start-ups?*

In order to identify key factors influencing small high technology start-ups to be international at or near inception, one-sample *t*-tests were conducted with the survey data collected for the UK and US international start-up samples. Additionally, one-sample *t*-tests were conducted with the 'other UK and US firm' samples (i.e. those firms not meeting the study's definitional criteria to be classed as international start-ups but nevertheless engaging in international activity to some degree). The underlying data related to this research question was collected in Survey Question 22 (see Appendix B), which asked the respondents to indicate the level of importance of 25 factors leading to their firms' initial involvement in international activity, utilising a 7-point Likert scale ranging from 'low' (1) to 'high' (7). As was discussed in the Research Methodology chapter, the 25 factors included in the questionnaire were derived from prior empirical study findings (outlined in Chapter 4) as well as this study's qualitative findings (outlined in Chapter 7).

One-sample *t*-tests were selected as the most appropriate univariate data analysis technique for testing the population means so as to determine which factors were significant. The alternative technique for testing population means, one-sample *z*-tests, was not appropriate since the population variances were unknown, which is generally the case (Diamantopoulos and Schlegelmilch, 1997). Since the sample sizes were all large (i.e. $n > 30$) and the distributions were approximately normal (i.e.

no substantial departures from normality), *t*-tests were the most optimal technique to employ (Diamantopoulos et al., 1997).

As indicated, one-sample *t*-tests were conducted with the UK and US international start-up samples as well as the 'other UK and US firms' samples to test if the population means for each of the 25 factors were greater than 4, which was the scale midpoint. If a factor was found to be statistically significant (at $p < 0.05$) in terms of exceeding this midpoint value, it was deemed to be an important and influential factor for the population. The statistically significant factors noted for the UK and US international start-up populations provide direct identification of the key factors influencing small high technology start-ups to be international at or near inception, since all of these firms were international at or near inception, thereby answering Research Question 2a.

Table 8.3 illustrates the *t*-test results for the UK international start-up sample. The table shows the *t*-value, degrees of freedom ($n-1$), 2-tailed significance, mean difference (from test value of 4) and the 95% confidence intervals for each of the 25 factors tested. Since the tests are directional (i.e. one-tailed, looking for values *greater* than 4), the *p*-values listed in the table must be halved. The factors found to be statistically significant are highlighted in bold font.

	Test Value = 4					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Importance of Factors to Internationalisation: Founder(s) International Vision	16.294	46	.000	2.2128	1.9394	2.4861
Founders' International Experience	8.837	46	.000	1.6809	1.2980	2.0637
Governmental Agency Advice/Assistance	-8.589	45	.000	-1.7391	-2.1470	-1.3313
International Mindset from Beginning	5.768	45	.000	1.3696	.8913	1.8478
Specific International Opportunity	7.898	45	.000	1.5652	1.1661	1.9644
Capitalise on Proprietary Technology Internationally	1.840	45	.072	.5652	-.0534	1.1839
Desire to be an International Market Leader	8.459	45	.000	1.7174	1.3085	2.1263
Prospective Customers were Foreign	8.076	46	.000	1.7872	1.3418	2.2327
Knowledge of International Customers	4.522	45	.000	1.1087	.6148	1.6026
International Contacts/Sales Leads	5.293	46	.000	1.1064	.6856	1.5271
OEM Customers Sold Company's Products Internationally	-1.699	44	.096	-.6000	-1.3115	.1115
Supplement Domestic Sales	.144	44	.887	.0444	-.5797	.6686
To Achieve Economies of Scale	2.684	45	.010	.7609	.1899	1.3319
Short Product Life Cycles	-5.869	44	.000	-1.5111	-2.0300	-.9922
High R&D Costs	-1.370	45	.178	-.3913	-.9667	.1841
Small Domestic Market	-.319	46	.751	-.0851	-.6217	.4515
Avoid Direct Domestic Competition	-8.817	44	.000	-1.8222	-2.2388	-1.4057
International Nature of Industry	7.285	44	.000	1.7111	1.2377	2.1845
Respond to Competitor Inivatives World-wide	2.701	44	.010	.7111	.1805	1.2417
Ability to Pre-empt Competitors	1.969	44	.055	.4667	-.0109	.9443
Pressure from Customers	-2.511	43	.016	-.6818	-1.2295	-.1341
Influence of Business Partners	-3.805	43	.000	-1.1818	-1.8082	-.5554
Obtain Foreign Financing	-20.61	43	.000	-2.6136	-2.8694	-2.3579
Homogeneity of International Markets	-1.713	44	.094	-.4889	-1.0640	.0862
Technological Advances Reduced Barriers	-.374	44	.710	-.1111	-.7093	.4871

Table 8.3: One-sample *t*-test Results for Factors Influencing Early Internationalisation of UK International Start-ups

As can be seen in Table 8.3, the following were found to be key factors (i.e. statistically significant) influencing UK small high technology start-ups to be international at or near inception: *international vision of the founder(s), founders' international experience, desire to create an international mindset in the firm from the beginning, identification of a specific international opportunity, desire to be an*

international market leader, large proportion of prospective customers were foreign, personal knowledge of international customers, international contacts and sales leads, international sales required to achieve economies of scale, international and competitive nature of the firm's industry, need for ability to respond to competitor initiatives world-wide, desire to capitalise on a proprietary technology internationally and need for ability to pre-empt competitors. All of these factors were found to be highly significant (i.e. p-values <0.01) with the exception of the last two listed factors, which were found to be statistically significant, but to a lesser degree. The same *t*-test conducted with the 'other UK firms' (which did not meet the study's parameters to be classed as international start-ups but nevertheless engaged in international business to some degree) found only one significant factor to influence their initial international activity: the identification of a specific international opportunity. The implications for the differences between the factors noted for the two samples will be addressed in the Discussion and Conclusions section of the chapter.

As illustrated in Table 8.4, the following were found to be key factors (i.e. statistically significant) influencing US small high technology start-ups to be international at or near inception: *international vision of the founder(s), founders' international experience, desire to create an international mindset in the firm from the beginning, identification of a specific international opportunity, desire to be an international market leader, international contacts and sales leads, international and competitive nature of the firm's industry and the opportunity to supplement domestic sales.* It should be noted that all of these factors were found to be highly significant (i.e. p-values <0.01). The same *t*-test conducted with the 'other US firms' found the following to be significant factors influencing their initial international activity: *international vision of the founder(s), identification of a specific international opportunity, desire to capitalise on a proprietary technology internationally and the opportunity to supplement domestic sales.*

	Test Value = 4					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Importance of Factors to Internationalisation: Founder(s) International Vision	6.727	43	.000	1.7273	1.2095	2.2451
Founders' International Experience	2.737	43	.009	.8864	.2333	1.5395
Governmental Agency Advice/Assistance	-12.823	43	.000	-2.2500	-2.6039	-1.896
International Mindset from Beginning	3.254	43	.002	.9091	.3457	1.4724
Specific International Opportunity	5.365	42	.000	1.2791	.7979	1.7602
Capitalise on Proprietary Technology Internationally	.280	42	.781	.0930	-.5779	.7640
Desire to be an International Market Leader	4.575	43	.000	1.2045	.6736	1.7355
Prospective Customers were Foreign	1.038	43	.305	.2727	-.2574	.8028
Knowledge of International Customers	-.746	43	.460	-.2273	-.8419	.3873
International Contacts/Sales Leads	4.690	43	.000	1.0000	.5700	1.4300
OEM Customers Sold Company's Products Internationally	-3.043	41	.004	-1.0238	-1.7034	-.3443
Supplement Domestic Sales	4.766	43	.000	1.1591	.6687	1.6495
To Achieve Economies of Scale	-1.956	43	.057	-.6364	-1.2923	.0196
Short Product Life Cycles	-15.012	42	.000	-2.2093	-2.5063	-1.912
High R&D Costs	-5.322	43	.000	-1.4091	-1.9431	-.8751
Small Domestic Market	-8.934	43	.000	-2.0909	-2.5629	-1.619
Avoid Direct Domestic Competition	-13.218	42	.000	-2.4186	-2.7879	-2.049
International Nature of Industry	4.036	41	.000	1.1190	.5590	1.6790
Respond to Competitor Initiatives World-wide	-.366	42	.716	-.1163	-.7577	.5251
Ability to Pre-empt Competitors	-1.155	42	.255	-.3256	-.8943	.2432
Pressure from Customers	-4.994	42	.000	-1.2558	-1.7633	-.7484
Influence of Business Partners	-4.178	42	.000	-1.1628	-1.7244	-.6012
Obtain Foreign Financing	-33.407	42	.000	-2.7442	-2.9100	-2.578
Homogeneity of International Markets	-3.786	42	.000	-1.0000	-1.5330	-.4670
Technological Advances Reduced Barriers	-1.861	43	.070	-.4545	-.9472	.0381

Table 8.4: One-sample *t*-test Results for Factors Influencing Early Internationalisation of US International Start-ups

In order to make comparisons between the findings for the UK and US international start-up populations and determine statistically significant differences, thereby answering Research Question 2b, a two-sample *t*-test must be conducted. A two-sample *t*-test is the most optimal bivariate data analysis technique to use since it

determines if statistical differences exist between the means of two populations that are measured utilising metric data (Diamantopoulos et al., 1997). Table 8.5 illustrates the results of the two-sample *t*-test for the UK and US international start-up populations. The table shows the *t*-value, degrees of freedom ($n-2$), two-tailed significance and the mean difference for each of the 25 factors tested. The factors found to be statistically significant (at $p < 0.05$) are highlighted in bold font. F-tests for equality of variances were conducted in order to determine if equal variances should or should not be assumed in the *t*-test, based on the significance of the F-value. To ease the viewing of the results, only the findings under the appropriate category (i.e. equal variances assumed or not assumed) are illustrated.

	t-test for Equality of Means			
	t	df	Sig. (2-tailed)	Mean Difference
	Importance of Factors to Internationalisation: Founder(s) International Vision	1.671	65.623	.099
Founders' International Experience	2.115	69.995	.038	.7945
Governmental Agency Advice/Assistance	1.900	88	.061	.5109
International Mindset from Beginning	1.260	88	.211	.4605
Specific International Opportunity	.928	87	.356	.2861
Capitalise on Proprietary Technology Internationally	1.045	87	.299	.4722
Desire to be an International Market Leader	1.551	88	.125	.5128
Prospective Customers were Foreign	4.428	89	.000	1.5145
Knowledge of International Customers	3.430	88	.001	1.3360
International Contacts/Sales Leads	.356	89	.723	.1064
OEM Customers Sold Company's Products Internationally	.869	85	.389	.4238
Supplement Domestic Sales	-2.831	82.782	.006	-1.1146
To Achieve Economies of Scale	3.247	88	.002	1.3972
Short Product Life Cycles	2.354	69.661	.021	.6982
High R&D Costs	2.607	88	.011	1.0178
Small Domestic Market	5.624	89	.000	2.0058
Avoid Direct Domestic Competition	2.153	86	.034	.5964
International Nature of Industry	1.637	85	.105	.5921
Respond to Competitor Initiatives World-wide	2.012	86	.047	.8274
Ability to Pre-empt Competitors	2.159	86	.034	.7922
Pressure from Customers	1.549	85	.125	.5740
Influence of Business Partners	-.046	85	.964	-.0190
Obtain Foreign Financing	.860	85	.392	.1305
Homogeneity of International Markets	1.311	86	.193	.5111
Technological Advances Reduced Barriers	.891	87	.375	.3434

Table 8.5: Two-Sample *t*-test Results for Statistical Differences between the Factors Influencing the Early Internationalisation of UK and US International Start-ups

As can be seen in Table 8.5, numerous significant differences exist between the means of the factors for the UK and US international start-up populations. The following factors were found to have significantly different means among the two populations: *founders' international experience, large proportion of prospective customers were foreign, personal knowledge of international customers, international sales required to achieve economies of scale, short product life cycles necessitated international sales, high R&D costs necessitated international sales,*

small domestic market, avoidance of intense or direct domestic competition, need for ability to respond to competitor initiatives world-wide, need for ability to pre-empt competitors and the opportunity to supplement domestic sales. In all but the final factor listed, the opportunity to supplement domestic sales, the UK international start-up population means were higher than those of the US. Furthermore, it should be noted that four of the factors listed had population means for both the UK and US below the scale midpoint, indicating lesser importance. These four factors were: short product life cycles necessitated international sales, high R&D costs necessitated international sales, small domestic market and the avoidance of intense or direct domestic competition.

8.3 FACTORS INFLUENCING THE SELECTION OF INITIAL COUNTRY MARKETS FOR SMALL HIGH TECHNOLOGY INTERNATIONAL START-UPS

This section addresses Research Question 3, applying univariate and bivariate data analysis techniques to answer the research question as well as to determine the support of the findings for Proposition 3, which will be reviewed in the Discussion and Conclusions section (Section 8.5). The two-part research question is restated below.

Research Question 3

- a) What are the principal factors influencing the selection of initial country markets for small high technology international start-ups?*
- b) What differences exist, if any, between these factors for UK and US international start-ups?*

Based on the same rationale utilised in the previous section, one-sample *t*-tests were conducted in order to answer the first part of the research question and a two-sample *t*-test to answer the second part. The underlying data related to this research question was collected in Survey Question 17 (see Appendix B), which asked the respondents

to indicate the level of importance of 9 factors to the selection of their firm's first five foreign markets, utilising a 5-point Likert scale ranging from 'low' (1) to 'high' (5). As was discussed in the Research Methodology chapter, the 9 factors included in the questionnaire were derived from internationalisation theory (outlined in Chapter 3), prior empirical study findings (outlined in Chapter 4) as well as this study's qualitative findings (outlined in Chapter 7). All of the *t*-test specifications discussed in the previous section (e.g. significant at $p < 0.05$, halving the *p*-values and equality of variance assumptions) are the same for the analyses in this section except that the scale midpoint is 3 since a 5-point Likert scale is used.

Table 8.6 illustrates the results of a one-sample *t*-test conducted with the UK international start-up sample. As can be readily seen by the bold font, 3 factors were found to be highly significant, indicating that the population means exceeded the scale midpoint (3) for these 3 factors. Accordingly, the most important factors influencing the selection of initial country markets for the UK small high technology international start-up population were: *large foreign markets*, *key and important industry markets* and *international contacts and sales leads*. The same *t*-test conducted with the 'other UK firms' found two significant factors (albeit to a lesser degree) influencing their selection of initial country markets: *key and important industry markets* and *international contacts and sales leads*.

	Test Value = 3					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Importance to Selection of First Five For. Mkts: Large Foreign Markets	4.947	46	.000	.8723	.5174	1.2273
Key Industry Markets	6.899	46	.000	1.1489	.8137	1.4841
Following Domestic Customers	-4.323	45	.000	-.7826	-1.1472	-.4180
Unsolicited Foreign Orders	-1.833	46	.073	-.3404	-.7142	.0334
Intl Contacts and Sales Leads	5.544	47	.000	.9167	.5841	1.2493
Influence of Network and Alliance Partners	.596	46	.554	.1277	-.3036	.5589
Geographic Closeness	-5.324	45	.000	-.8696	-1.1985	-.5406
English-speaking Nations	-3.125	46	.003	-.5106	-.8396	-.1817
Cultural Similarities	-6.483	46	.000	-1.0426	-1.3663	-.7188

Table 8.6: One-sample *t*-test Results for Factors Influencing the Selection of Initial Country Markets for UK International Start-ups

Similarly, Table 8.7 illustrates the one-sample *t*-test results for the US international start-up sample. As can be seen, the same 3 factors were found to be highly significant. Thus, the most important factors influencing the selection of initial country markets for the US small high technology international start-up population were: *large foreign markets, key and important industry markets and international contacts and sales leads*, thereby answering Research Question 3a (in conjunction with the UK findings presented in the previous paragraph). The same *t*-test conducted with the ‘other US firms’ sample found the same 3 significant factors (although to a lesser degree) to influence their selection of initial country markets: large foreign markets, key and important industry markets and international contacts and sales leads.

	Test Value = 3					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Importance to Selection of First Five For. Mkts: Large Foreign Markets	5.397	44	.000	.9778	.6127	1.3429
Key Industry Markets	3.827	44	.000	.7778	.3682	1.1874
Following Domestic Customers	-3.521	43	.001	-.7273	-1.1438	-.3107
Unsolicited Foreign Orders	.713	43	.480	.1364	-.2493	.5220
Intl Contacts and Sales Leads	6.991	43	.000	.9773	.6953	1.2592
Influence of Network and Alliance Partners	.608	43	.546	.1364	-.3160	.5887
Geographic Closeness	-5.569	42	.000	-1.0233	-1.3941	-.6524
English-speaking Nations	-1.701	44	.096	-.3333	-.7282	.0615
Cultural Similarities	-5.715	44	.000	-.9333	-1.2624	-.6042

Table 8.7: One-sample *t*-test Results for Factors Influencing the Selection of Initial Country Markets for US International Start-ups

Table 8.8 displays the results of a two-sample *t*-test designed to determine if statistically significant differences exist between the means of the UK and US international start-up populations. As can be seen, no statistically significant differences were found between the factors influencing the selection of initial country markets for UK and US international start-ups, thereby answering Research Question 3b.

	t-test for Equality of Means			
	t	df	Sig. (2-tailed)	Mean Difference
	Importance to Selection of First Five For. Mkts: Large Foreign Markets	-.417	90	.678
Key Industry Markets	1.418	90	.160	.3712
Following Domestic Customers	-.202	88	.840	-.0553
Unsolicited Foreign Orders	-1.789	89	.077	-.4768
Intl Contacts and Sales Leads	-.277	90	.782	-.0606
Influence of Network and Alliance Partners	-.028	89	.978	-.0087
Geographic Closeness	.627	87	.532	.1537
English-speaking Nations	-.697	90	.487	-.1773
Cultural Similarities	-.476	90	.635	-.1092

Table 8.8: Two-sample *t*-test Results for Statistical Differences between the Factors Influencing the Selection of Initial Country Markets for UK and US International Start-ups

8.4 FACTORS INFLUENCING THE EARLY ESTABLISHMENT OF FOREIGN-BASED ORGANISATIONAL ACTIVITIES BY SMALL HIGH TECHNOLOGY INTERNATIONAL START-UPS

This section addresses Research Question 4, applying univariate and bivariate data analysis techniques to answer the research question as well as to determine the support of the findings for Proposition 4, which will be reviewed in the Discussion and Conclusions section (Section 8.5). The research question is restated below.

Research Question 4

What are the primary factors influencing small high technology international start-ups to establish organisational activities (e.g. sales or service offices) in foreign countries in the early years of their existence?

A one-sample *t*-test was conducted in order to address the research question, based on the underlying principles discussed in the previous two sections. However, rather

than testing separate UK and US samples, only one sample consisting of both UK and US international start-ups was tested in order to achieve a large sample size (i.e. $n > 30$), thereby allowing parametric testing (N.B. not all UK and US international start-ups in the original samples established foreign-based organisational activities in the early years of their existence). The underlying data related to this research question was collected in Survey Question 21 (see Appendix B), which asked the respondents to indicate the level of importance of 9 objectives to their firm's decision to locate organisational activities in foreign countries during their first five years of international activity, utilising a 5-point Likert scale ranging from 'low' (1) to 'high' (5). The 9 factors included in the questionnaire were derived from internationalisation theory (outlined in Chapter 3), prior empirical study findings (outlined in Chapter 4) as well as this study's qualitative findings (outlined in Chapter 7).

Table 8.9 illustrates the results of a one-sample *t*-test conducted with the UK and US international start-up sample. As can be seen by the bold font, 3 factors were found to be highly significant, indicating that the population means exceeded the scale midpoint for these 3 factors. Thus, the most important factors influencing the early establishment of foreign-based organisational activities for the UK and US small high technology start-up population were: *to establish a 'physical' presence in a key foreign market, to create the perception of a 'local' company rather than a foreign company and to provide better regional sales and service support*, thereby answering Research Question 4. The same one-sample *t*-test conducted with the 'other UK and US firms' sample found the same 3 factors to be highly significant, while a two-sample *t*-test found that no significant differences existed between the means of the international start-up and 'other firm' populations for these early foreign-based organisational activity establishment factors.

	Test Value = 3					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Importance to Foreign Organisational Activity Decision: Physical Presence	8.012	44	.000	1.2889	.9647	1.6131
Perception as a Local Company Compete in Competitor's Home-ground	3.010	44	.004	.5778	.1909	.9647
Necessity to locate Near Foreign Customer	-1.431	43	.160	-.3182	-.7666	.1302
Better Regional Sales/Service Support	.000	43	1.000	.0000	-.4447	.4447
Lower Operational Costs	6.742	44	.000	1.0889	.7634	1.4144
Obtain High Quality Personnel	-1.980	44	.054	-.4000	-.8071	.0071
Obligation to Locate Near Funding Source	-2.572	44	.014	-.4667	-.8324	-.1009
Overcome Tariff/Trade Barriers	-11.97	42	.000	-1.5581	-1.8208	-1.2954
	-10.61	40	.000	-1.4878	-1.7712	-1.2044

Table 8.9: One-sample *t*-test Results for Factors Influencing the Early Establishment of Foreign-Based Organisational Activities by UK and US Small High Technology International Start-ups

8.5 DISCUSSION AND CONCLUSIONS

The chapter commenced with a descriptive analysis of the survey respondents. The resulting profile of the responding UK and US firms showed them to be generally young, small, of independent origin and manufacturing and high technology oriented. Furthermore, the firms in most cases demonstrated early and extensive internationalisation, with 49 UK and 45 US firms meeting the study's definitional parameters to be classed as international start-ups. Overall, the profile and quality of the responding firms in the survey, in terms of their characteristics facilitating the research objectives of the study, was highly satisfactory.

Sections 8.2 to 8.4 provided illustrations of the survey findings pertaining to Research Questions 2-4. While the sections detailed the results of the data analysis, which consisted of one-sample and two-sample *t*-tests, this final section moves beyond the statistical analysis by not only providing summaries of each set of

findings, but also providing a discussion and evaluation of each set of findings. Additionally, the support of the study's findings for the corresponding research propositions (i.e. Research Propositions 2-4) will be discussed. Each of the three research questions/propositions is individually addressed below.

Key Factors Influencing Small High Technology Start-ups to be International at or Near Inception

Research Question 2a: *What are the key factors influencing small high technology start-ups to be international at or near inception?* Table 8.10 provides a succinct summary of the key factors influencing UK and US small high technology international start-ups to be international at or near inception. The table illustrates only those factors that were found to be statistically significant for each country, suggesting particular importance for the factors based on the population means exceeded the survey scales' midpoints.

Factors	Countries Significant	
International Vision of the Founder(s)	UK	US
Founders' International Experience	UK	US
Desire to Create an International Mindset in the Firm from the Beginning	UK	US
Identification of a Specific International Opportunity	UK	US
Desire to Capitalise on a Proprietary Technology Internationally	UK	
Desire to be an International Market Leader	UK	US
Large Proportion of Prospective Customers were Foreign	UK	
Personal Knowledge of International Customers	UK	
International Contacts and Sales Leads	UK	US
International Sales Required to Achieve Economies of Scale	UK	
International and Competitive Nature of the Firm's Industry	UK	US
Need for Ability to Respond to Competitor Initiatives World-wide	UK	
Need for Ability to Pre-empt Competitors	UK	
Opportunity to Supplement Domestic Sales		US

Table 8.10: Summary of Significant Factors Influencing UK and US Small High Technology International Start-ups to be International at or Near Inception (significant at $p < 0.05$)

The level of importance of the 25 original factors discerned from the literature and subsequently measured in the survey can also be evaluated by examining the most important and least important three factors listed by the UK and US international start-ups. The three most important factors found to be influencing UK small high technology international start-ups to be international at or near inception, based on the highest mean values (as illustrated in Table 8.3), were the international vision of the founder(s) (1), a large proportion of prospective customers were foreign (2) and the desire to be an international market leader (3), while the three least important were the need to obtain foreign financing (25), the avoidance of intense or direct domestic competition (24) and the advice and assistance from governmental agencies (23). Very similarly, the three most important factors found for the US international

start-ups (see Table 8.4) were the international vision of the founder(s) (1), the identification of a specific international opportunity (2) and the desire to be an international market leader (3), while the three least important were the need to obtain foreign financing (25), the avoidance of intense or direct domestic competition (24) and the advice and assistance from governmental agencies (23).

The international vision of the founder(s) was found to be the most important factor for both the UK and US firms, suggesting that it is the principal factor influencing small high technology start-ups to be international at or near inception. The prominent role of the founders' international vision is illustrated in UK Case Studies Epsilon and Zeta and US Case Studies Alpha and Beta (see Chapter 7). The recognition that a large proportion of the firm's prospective customers were foreign along with the identification of specific international opportunities were also found to be key early internationalisation factors, which demonstrates the dynamic forces of high technology industry internationalisation. The influence of the identification of specific international opportunities is illustrated in Case Studies Alpha and Gamma. Another noteworthy factor found to influence the early internationalisation of small high technology start-ups was the desire of the founders and top management team to be international market leaders, which again illustrates the prominent role of industry internationalisation in the firm's early internationalisation process. This final factor is exemplified in Case Study Beta. The support of these findings for existing literature is discussed in the Conclusion chapter (Section 10.1.1).

A crucial question arises as to whether these identified factors are unique to international start-ups or if they likewise apply to all small high technology firms that exhibit at least some degree of internationalisation, be it at or near inception, gradually or later in their existence. The study's data suggests that the factors are indeed unique, based on the results of one-sample *t*-tests conducted with the 'other UK and US firms' samples, which found only one of the original 25 factors to be significant for the UK firms and four for the US firms. The identification of a specific international opportunity was found to be significant for both the 'other UK and US firms', while the three additional US factors were the desire to capitalise on a

proprietary technology internationally, the opportunity to supplement domestic sales and the international vision of the founder(s). Although the last factor noted is rather enigmatic, the other three can be readily explained as factors that are likewise applicable to later stage internationalising firms, which pursue international opportunities as they arise or become manifest later in their existence.

Research Question 2b: *What differences exist, if any, between these factors for UK and US start-ups?* Table 8.11 summarises the factors that were found to be significantly different for UK and US international start-ups, based on a two-sample *t*-test. It should be noted that the final four factors listed in the table had population means below the scale midpoint for both the UK and US firms, indicating lesser importance. Furthermore, as can be seen in the table, each of the factors found to be significantly different had a greater relative importance for UK firms, as evidenced by higher population means, except that the factor ‘opportunity to supplement domestic sales’ had a greater importance for US firms. Whereas most of the means of the UK firms’ responses for this research question were higher than those of the US firms, an analysis of responses for all survey questions found no consistent pattern of higher UK ratings, thereby suggesting a high level of validity for the research question’s results.

Factors	Country Indicating Greater Importance
Founders' International Experience	UK
Large Proportion of Prospective Customers were Foreign	UK
Personal Knowledge of International Customers	UK
International Sales Required to Achieve Economies of Scale	UK
Need for Ability to Respond to Competitor Initiatives World-wide	UK
Need for Ability to Pre-empt Competitors	UK
Opportunity to Supplement Domestic Sales	US
Short Product Life Cycles Necessitated International Sales	UK
High R&D Costs Necessitated International Sales	UK
Small Domestic Market	UK
Avoidance of Intense or Direct Domestic Competition	UK

Table 8.11: Summary of Statistically Significant Differences between Factors Influencing the Early Internationalisation of UK and US International Start-ups (significant at $p < 0.05$)

One explanation for several of the differences noted between the factors influencing UK and US international start-ups to be international at or near inception centres around the lone factor found to be of greater importance for US firms, the opportunity to supplement domestic sales. Based on the ramifications of a substantially larger US domestic market as well as differences in culture and attitudes (see Chapter 2), many US firms view international sales as a supplemental method of obtaining revenue as opposed to being viewed by many UK firms as a more essential method, in light of their smaller domestic market and close proximity to numerous foreign markets. This postulate provides a partial explanation for the UK and US firm differences for the following factors: founders' international experience, large proportion of prospective customers were foreign, personal knowledge of international customers, international sales required to achieve economies of scale, opportunity to supplement domestic sales, small domestic market and the avoidance of intense or direct domestic competition.

Proposition 2: *That the key factors influencing small high technology start-ups to be international at or near inception are the founders' previous international experience and the international and competitive nature of the firms' industry is supported* by the findings. As can be seen in Table 8.10, the founders' international experience and the international and competitive nature of the firms' industry were found to be statistically significant and hence important factors influencing both UK and US small high technology start-ups to be international at or near inception.

Key Factors Influencing the Selection of Initial Country Markets for Small High Technology International Start-ups

Research Question 3a: *What are the principal factors influencing the selection of initial country markets for small high technology international start-ups?* Table 8.12 provides a summary of the key factors influencing the selection of initial country markets for UK and US small high technology international start-ups. The table illustrates the three factors that were found to be statistically significant for each country, indicating greater importance. The following case studies, which were presented in Chapter 7, provide illustrations of these findings: Delta, Epsilon and Zeta exemplify the factors 'large foreign markets' and 'key and important industry markets', while Alpha, Gamma, and Delta exemplify 'international contacts and sales leads'. The support of these findings for existing literature is discussed in the Conclusion chapter (Section 10.1.3).

Factors	Countries Significant	
Large Foreign Markets	UK	US
Key and Important Industry Markets	UK	US
International Contacts and Sales Leads	UK	US

Table 8.12: Summary of Significant Factors Influencing the Selection of Initial Country Markets for UK and US Small High Technology International Start-ups (significant at $p < 0.05$)

The three noted factors influencing the selection of initial country markets for UK and US international start-ups do not appear to be unique to international start-ups, but rather apply to all UK and US firms. Evidence is provided by the results of one-sample *t*-tests conducted with the 'other UK and US firms' samples. 'Key and important industry markets' and 'international contacts and sales leads' were found to be significant factors for 'other UK firms', while 'large foreign markets', 'key and important industry markets' and 'international contacts and sales leads' were found to be significant factors for 'other US firms'. However, in each of these cases the *p*-values indicated lesser significance. Thus, while the three noted factors influencing the selection of initial country markets may have a greater importance for international start-ups, they are likewise applicable to other international firms.

The survey findings for this research question have implications for internationalisation theory. The network approaches to internationalisation hold that the selection of foreign markets is influenced by network relationships (see Chapter 3). As can be seen in Tables 8.6 and 8.7, while the mean of the 'influence of network and alliance partners' factor was above the scale midpoint for both the UK and US samples, it was not found to be statistically significant for the populations. Thus, while the factor appears to be of some importance, it cannot be concluded to be of great importance (i.e. statistically significant in terms of the mean exceeding the scale midpoint) for UK and US international start-ups, thereby suggesting only limited support for this dimension of the network approaches to internationalisation. The findings for this research question also has implications for the 'psychic distance' component of the Uppsala internationalisation process model, which holds that firms enter new country markets with progressively greater psychic distance (see Chapter 3). As can be seen in Tables 8.6 and 8.7, three dimensions of psychic distance, that is cultural similarities, English-speaking nations and geographic distance, were tested and found to be significantly negative (indicating that the population means were less than the scale midpoint) for both UK and US international start-ups. Thus, the study's findings regarding factors influencing the selection of initial country markets found no support for the psychic distance dimension of the Uppsala internationalisation process model.

Research Question 3b: *What differences exist, if any, between these factors for UK and US international start-ups?* As was seen in Table 8.8, no significant differences were found between the factors influencing the selection of initial country markets for UK and US international start-ups.

Proposition 3: *That the principal factors influencing the selection of initial country markets for small high technology international start-ups are the assessments of being large and leading industry markets is supported* by the findings. As can be seen in Table 8.12, the assessments of being large and key/important industry markets were found to be statistically significant and therefore important factors influencing the selection of initial country markets for both UK and US international start-ups.

Key Factors Influencing the Early Establishment of Foreign-based Organisational Activities by Small High Technology International Start-ups

Research Question 4: *What are the primary factors influencing small high technology international start-ups to establish organisational activities (e.g. sales or service offices) in foreign countries in the early years of their existence?* Table 8.13 provides a summary of the key factors influencing the early establishment of foreign-based organisational activities for UK and US small high technology international start-ups. The table illustrates the three factors that were found to be statistically significant, indicating greater importance. The prominent roles of these factors/objectives are illustrated in the following case studies (presented in Chapter 7): Alpha, Beta, Gamma, Delta and Zeta exemplify the objective ‘to establish a physical presence in a key foreign market’, Epsilon and Zeta ‘to create the perception of a ‘local’ company rather than a foreign company’ and all six case studies ‘to better provide regional sales and service support’. The support of these findings for existing literature is discussed in the Conclusion chapter (Section 10.1.4).

Factors
To Establish a Physical Presence in a Key Foreign Market
To Create the Perception of a 'Local' Company rather than a Foreign Company
To Better Provide Regional Sales and Service Support

Table 8.13: Summary of Significant Factors Influencing UK and US Small High Technology International Start-ups to Establish Foreign-Based Organisational Activities in the Early Years of their Existence (significant at $p < 0.05$)

The three noted factors influencing the early establishment of foreign-based organisational activities for UK and US international start-ups are not unique to international start-ups, but rather apply to all UK and US firms. Evidence is provided by the results of a one-sample *t*-test conducted with the 'other UK/US firms' sample. The same three factors were found to be highly significant for 'other UK/US firms', suggesting that the key factors influencing the establishment of foreign-based organisational activities are common to all firms regardless of whether the decision is made early or later in the firm's existence. This was further supported by the results of a two-sample *t*-test, which found no significant differences between the means of the UK/US international start-ups and that of the 'other UK/US firms' populations.

The survey findings for this research question have implications for internationalisation theory. The economic approaches to internationalisation, specifically internalisation theory, contend that firms choose the least cost location for each activity they perform (see Chapter 3). As can be seen in Table 8.9, the factor/objective 'to benefit from lower operational costs' was tested and found to be a significant negative factor (indicating that the population mean was less than the scale midpoint) in terms of influencing the early establishment of foreign-based organisational activities by UK and US international start-ups. Thus, the findings indicate little support for this dimension of internalisation theory.

Proposition 4: That the primary factors influencing small high technology international start-ups to establish organisational activities in foreign countries during the early years of their existence are the establishment of a local presence in

key industry markets and the provision of enhanced regional sales and service support is supported by the findings. As was shown in Table 8.13, the establishment of a physical presence in key foreign markets and the provision of enhanced regional sales and service support were both found to be statistically significant and hence important factors influencing the early establishment of foreign-based organisational activities by UK and US small high technology international start-ups.

INTRODUCTION

Whereas Chapter 8 addressed Research Questions 2-4, this chapter provides an in-depth analysis of Research Question 1. Research Question 1 pertains to the central research issue of this thesis, firm-specific determinants of success for small high technology international start-ups. As such, various characteristics of these firms will be examined in relation to their performance. Before commencing with a description of the data analysis methodology, the three-part research question is restated below.

Research Question 1

- a) *Which founder, organisation and product and marketing strategy characteristics of small high technology international start-ups are significantly correlated with performance?*
- b) *Which of these characteristics are the best predictors of performance for small high technology international start-ups?*
- c) *What differences exist, if any, between these findings for UK and US international start-ups?*

In order to determine which collective sets of characteristics are the best predictors of performance, and hence success, multivariate data analysis must be employed. Multivariate methods enable the simultaneous analysis of more than two variables, thereby analysing the collective dynamics of several characteristics in relation to performance. Put another way, it provides this study with a determination of the impact of various combinations of characteristics on performance. Employing a dependence multivariate technique, the various characteristics of international start-

ups measured in the study represent the independent variables, while performance represents the dependent variable.

Several multivariate techniques were available to analyse the data, such as structural equation modeling, multivariate analysis of covariance (MANCOVA) and multiple regression. Structural equation modeling simultaneously analyses multiple relationships of dependent and independent variables, whereas MANCOVA simultaneously examines relationships between several categorical independent variables and two or more dependent variables while removing the effect of any uncontrolled independent variables on the dependent variables (Hair, Anderson, Tatham and Black, 1998). However, the utilisation of these two techniques was rejected due to the limited number of cases in the subgroups (i.e. 49 UK and 45 US international start-ups) and the unnecessary level of sophistication inherent in the techniques, which would add a questionable amount of value and clarity to the results.

Multiple regression was therefore selected as the most appropriate and simplistic multivariate method to analyse the relationship between the independent and dependent variables in this study since it provides a prediction of changes in a single dependent variable as a result of changes in two or more independent variables, thereby facilitating analysis of each of the three underlying questions comprising Research Question 1. Specifically, it will enable the determination of which characteristics are significantly correlated with performance, which characteristics constitute the best predictors of performance and ascertain if differences exist between these characteristics for UK and US international start-ups.

The independent variables in the multiple regression analysis stem from Survey Question 23 (see Appendix B), which asked the respondent to indicate the extent to which numerous characteristics existed in his/her company during the first five years of its initial international activity, utilising identical 7-point Likert scales ranging from 'not existent' (1) to 'strongly existent' (7). The characteristics were divided

into three distinct classifications: founder (17 variables), organisation (16 variables) and product and marketing strategy (24 variables). As discussed in the Research Methodology chapter, these characteristics were derived from prior empirical study findings (outlined in Chapter 5) as well as this study's qualitative findings (outlined in Chapter 7).

The dependent variables to be individually utilised in the multiple regression analysis originate from Survey Questions 25-29. Question 25 asks the respondent to rate his/her company's *international sales growth* during its first five years of international activity relative to its objectives, utilising a 7-point Likert scale ranging from 'unsuccessful' (1) to 'successful' (7). Similarly, Question 26 asks the respondent to rate his/her company's *international profit growth* during its first five years of international activity relative to its objectives, using the same scale. Question 27 asks the respondent to indicate the extent to which his/her company *achieved all of its initial international strategic objectives* during its first five years of international activity, utilising a 7-point Likert scale ranging from 'not achieved' (1) to 'fully achieved' (7). Question 28 asks for an estimate of the company's *average annual growth rate of international sales* for its first five years of international activity, providing a space to write in the response followed by '%'. Finally, Question 29 asks the respondent to rate the *average annual profitability* of his/her company's first five years of international activity, utilising a 7-point scale with 1 being 'highly unprofitable', 2 'moderately unprofitable', 3 'marginally unprofitable', 4 'breakeven', 5 'marginally profitable', 6 'moderately profitable', and 7 'highly profitable'. The basis for the selection of these performance indicators was derived from the literature, as described in the Research Methodology chapter (see Section 6.6.1).

The proper employment of multiple regression analysis mandates a meticulous examination of the data and requires that several preliminary conditions be met. First, the independent and dependent variables must be metric. This condition was satisfied since all variables used in this analysis are measured using metric scales (i.e.

interval and ratio scales). Second, the nature and extent of missing data must be determined so as to identify potential biases and facilitate the generalisability of the results. A missing data analysis was conducted for the UK and US international start-up sub-samples utilising SPSS. The analysis indicated that the extent of the missing data for each of the independent and dependent variables was minimal (ranging from 0-6.1% per variable, with most variables <4%) and of a random nature. Therefore, the appropriate approach taken was to include in the multivariate analysis only those observations with complete data (Hair et al., 1998), which still left acceptable sample sizes. The third requirement for multivariate data analysis involves the identification of detrimental outliers, so as to avoid the distortion of statistical tests. Whereas some outliers are beneficial and add richness to an analysis, others negatively impact multivariate analysis and are candidates for deletion. After profiling outliers amongst this study's independent and dependent variables utilising univariate detection (standard scores ≥ 2.5 , based on sample size) and multivariate detection (standardised residuals > 2.0 , Mahalanobis D^2 significant at .001), four observations were deemed to be outliers and were deleted from the analysis (Hair et al., 1998). All four outliers were related to one dependent variable, international sales growth (Survey Question 28). It should be noted again that with the exception of this survey question, all other independent and dependent variables utilised 7-point Likert scales. Question 28 asked the respondent to enter a specific value. While most values ranged from 0-100% average annual growth rate, four substantially deviated from this range and were regarded as exceptional. It was concluded that this action would not ultimately limit the generalisability of the results.

In addition to the above noted requirements, several underlying assumptions must be tested and satisfied in order to accurately conduct multivariate data analysis. The testing of the assumptions was conducted with both the individual variables and the multivariate model variates. The first assumption is normality. At the univariate level, the data distribution for many variables reasonably approximated a normal distribution while others demonstrated a slightly more pronounced departure from normality, as determined by histograms, normal probability plots and Kolmogorov-

Smirnov tests. Data transformations (e.g. inverse, square root and logarithms) were employed in an attempt to improve the normality of several variables. However, no substantive improvements were noted, which is not uncommon. Since the departures from normality were not extreme and multiple regression has been shown to be quite robust with regards to deviations from normality, the variables were retained in their original form (Hair et al., 1998). At the multivariate level, histogram and normal probability plot analyses of the residuals revealed no substantial deviations from normality. Therefore, no data transformations were conducted and the regression models were deemed to be accurate with regards to normality.

The second multivariate data analysis assumption is homoscedasticity, meaning that each dependent variable demonstrates equal levels of variance across the values of independent variables. Graphical analysis of residuals using scatterplots revealed the presence of homoscedasticity and a lack of heteroscedasticity, thereby satisfying this assumption. The third assumption is linearity, expressing the linear relationship or correlation between the independent variables and the dependent variable. Analysis of partial regression plots, enabling the examination of residual patterns for individual independent variables to the dependent variable, indicated the presence of linear relationships. Since no nonlinear relationships were observed, it was concluded that the linearity assumption was satisfied.

A paramount issue when conducting multivariate data analysis is the assurance of the validity and reliability of the underlying measures, so as to reduce measurement error. Validity refers to the degree that a measure correctly represents the intended concept, while reliability assesses the consistency of the measures. Measurement error, indicating inaccurate measurement of a variable's 'true' value, can result from many sources, for example data entry errors, respondent errors or the utilisation of inappropriate measurement scales. Great efforts were taken to minimise measurement error in this study and thus enhance its validity and reliability. The data were carefully scrutinised to detect and correct data entry errors prior to analysis. Furthermore, the survey instrument was meticulously reviewed by numerous experts

in the field as well as pre-tested and amended before posting the final version of the questionnaire, as detailed in Chapter 6, in order to reduce the incidence of respondent error and ensure the utilisation of the most appropriate measurement scales. Not only did these efforts serve to reduce measurement error, but also specification error, which stems from the inclusion of irrelevant independent variables and the omission of relevant ones.

Consistent with this study's goal of minimising measurement error, summated scales were widely employed. A summated scale is a composite measure of a concept formed by combining several related measurement variables into a single measure. The intent is to better represent the 'true' measure of a concept by utilising several indicators (i.e. related variables), thereby reducing measurement error. Factor analysis was conducted in order to serve as a basis for developing summated scales for both the independent (characteristic) and dependent (performance) variables and is illustrated in Section 9.1. Factor analysis was performed as a prelude to multiple regression analysis, which is presented in Section 9.2. This is followed by a discussion and summary of the findings in Section 9.3.

9.1 FACTOR ANALYSIS

As indicated in the introduction, factor analysis was conducted on all of the independent and dependent variables involved in the multiple regression analysis. Factor analysis is a process whereby the structure of a large number of variables is analysed in terms of its interrelationships and reduced into a much smaller set of common underlying dimensions known as factors. Each identified dimension can then be assessed as to the extent that it explains each variable. In this study exploratory factor analysis was conducted in order to reduce the data, create summated scales and facilitate multiple regression analysis. As discussed in the introduction, summated scales provide the benefits of reducing measurement error and incorporating multiple facets of a concept into a single measure. However, a key

objective for conducting factor analysis with the independent variables in this study was to comply with multiple regression sample size requirements, which stipulate that a minimum ratio of 5 observations for each independent variable be observed in order to generalise the results, and preferably a 15-20 to 1 ratio (Hair et al., 1998). Since the final sub-sample sizes of UK and US international start-ups in each multiple regression analysis conducted were 40-42, the three categories of independent variables (founder, organisation and product and marketing strategy characteristics) with their number of underlying variables being 17, 16 and 24 respectively, needed to be greatly reduced in order to meet the ratio requirement. As will be seen later in this section, factor analysis reduced the number of independent variables for the three categories to 4, 4 and 6 respectively, resulting in ratios of 10 to 1 for the first two categories and 6.67 to 1 for the final category. These ratios are within the acceptable standards and support the generalisability of the results.

The decision to conduct factor analysis with the dependent variables was based on a different objective than that of the independent variables. While the number of independent variables needed to be reduced to comply with observation-to-variable ratio standards, the dependent variables already had a 40 to 1 ratio, since multiple regression is conducted with a single dependent variable. Rather, the decision to factor analyse the dependent variables was based on an attempt to develop a single composite variable (summated scale) for performance based on the five indicators of performance. If accomplished, the new variable would provide the benefits of reducing measurement error and capturing multiple aspects of performance in a single measure. As will be seen in Section 9.1.4, the five dependent variables significantly loaded on a single factor, thereby providing statistical justification for the employment of a single composite variable.

Factor analysis was conducted with both the independent and dependent variables in the study utilising a single holistic sample comprised of all UK and US respondents (n=185). The reasons for the single sample analysis as opposed to sub-sample analysis are twofold. First, the larger sample size allows for a richer analysis of

common underlying dimensions among small high technology international firms. And second, factor analysis should generally not be conducted with samples of less than 50 observations, while the preferred number is 100 or more (Hair et al., 1998). The general rule is to maintain a minimum ratio of 5 observations per variable analysed, although a 10 to 1 or higher ratio is more acceptable, in order to enhance the generalisability of the results (Hair et al., 1998). Based on the individual quantity of the 3 groups of independent variables and the dependent variables (i.e. 17, 16, 24 and 5) in this study, the ratios of observations-to-variables to be factor analysed are 10.88 to 1, 11.56 to 1, 7.71 to 1 and 37 to 1. Thus, the sample sizes are within the acceptable guidelines and are conducive to the generalisability of the results.

The same factor analysis techniques were employed with the four analyses (3 independent variable categories and the dependent variables) that are presented in the following four sub-sections. Common factor analysis, as opposed to component analysis, was conducted since the objective was to identify common underlying dimensions within each variable set as a preliminary step towards multiple regression analysis, rather than summarise for predictive purposes. The extraction method utilised was principal axis factoring with Promax rotation. Promax, with Kaiser normalisation, is an oblique rotation method that simplifies the factor structure and improves the interpretation of the unrotated factor solutions created by principal axis factoring.

9.1.1 FOUNDER CHARACTERISTICS FACTOR ANALYSIS

Summary of Findings: Four founder characteristic factors were identified and were subsequently labelled as *planning, international business experience, international commitment, and income focus*.

The first category of independent variables to be factor analysed is founder characteristics, consisting of 17 original variables. Before commencing, a series of

tests to determine the appropriateness of conducting factor analysis with the set of variables must be performed. The first test involves an examination of the correlation data matrix for the variables. Since a substantial number of correlations exceeded .30 and most correlations were significant at $p < .05$, the test indicated that factor analysis was appropriate due to the variable set having sufficient correlations to justify the analysis (Hair et al., 1998). The second test is the Bartlett test of sphericity, which provides the statistical probability that significant correlations exist amongst the variables. The test result was highly significant at .000, indicating the appropriateness of factor analysis. The third test for determining appropriateness is the Kaiser-Meyer-Olkin measure of sampling adequacy (MSA), which quantifies the degree of variable intercorrelations based on an index of 0 to 1, with measures of .80 or above considered meritorious, .70 or above middling, .60 or above mediocre, .50 or above miserable and below .50 unacceptable (Kaiser, 1970, 1974). The MSA for the entire correlation matrix was found to be .841, which indicates a very high degree of appropriateness. Examination of the MSA for individual variables likewise indicated a high degree of appropriateness (all $\geq .756$). Thus, the appropriateness of conducting factor analysis with the founder characteristic variables can be readily validated.

Principal axis factoring was then performed with the founder characteristic variables in order to obtain an unrotated factor matrix, which provided an initial indication of the number of factors to extract. The procedure resulted in the initial extraction of four factors, based on latent roots or eigenvalues being greater than one, meaning that each factor accounted for the variance of at least one variable. Determining the number of factors to extract based on eigenvalues greater than one being considered significant is the most commonly applied factor selection technique (Hair et al., 1998). Ultimately, four factors were extracted for the final factor analysis, based on the latent root analysis results, the cumulative percentage of total variance explained by the four factors being 64.08% (above 50% satisfactory for exploratory social science studies) and the support of a scree plot test of the latent roots (Hair et al., 1998).

The factor matrix was then rotated using the Promax technique in order to enhance the interpretation of the unrotated factor matrix. The resulting pattern matrix is exhibited in Table 9.1. The matrix displays factor loadings (i.e. correlations) for each variable for each of the four factors. Based on a sample size of 185, factor loadings of .42 or above are considered significant (.05 significance level, 80% power level) (Hair et al., 1998). The highest factor loading for each variable, if significant, is then noted and becomes a component of the particular factor. To ease the reader's viewing of the factor matrix presented in Table 9.1, the significant factor loadings for each variable have been placed in bold font. However, two significant factor loadings have been removed from the analysis and are not in bold font. Factor 1 variable 'procurement of sufficient working capital' and Factor 2 variable 'previous start-up experience' were removed due to low, albeit significant, factor loadings (.421 and .464), low communalities (i.e. total variance shared with all other variables, with below .50 being considered to be lacking sufficient explanation) (both .387) and high loadings of the variables on other factors (Hair et al., 1998).

Founder Characteristic Variables	Factor			
	1	2	3	4
International Vision	-.019	.284	.663	-.151
International Open-mindedness	-.297	.215	.646	.083
Previous Business/Academic Distinction	.086	.780	-.029	.002
International Experience	.066	.957	-.034	-.134
Industry Experience	-.071	.507	.130	.233
Previous Start-up Experience	.131	.464	-.161	.347
Mix of Technical/Business Skills	-.088	.333	.256	.258
Determination/Tenacity	-.032	-.039	.692	.227
Commitment to be an Industry Leader	.318	-.151	.631	-.117
Willingness to Commit Resources Internationally	.165	-.161	.716	-.020
Strong International Business/Social Networks	.545	.373	.035	-.151
Extensive Planning Process	.805	-.007	.110	.081
Extensive Market Research	.773	.063	-.037	.078
Obtainment of Professional Advice	.604	-.013	-.065	.294
Procurement of Sufficient Working Capital	.421	.034	-.091	.402
Focus on Income Generation/Cash Flow	.194	-.030	.054	.514
Sales Function Support	.376	-.063	.247	.318

Table 9.1: Founder Characteristics Rotated Factor Matrix

The next step involves the interpretation of the significant factor loadings and the labelling of each factor, giving greater emphasis to the higher loaded variables. For Factor 1 the highest loaded variable was 'extensive planning process', followed by 'extensive market research', 'obtainment of professional advice' and 'strong international business/social networks'. Capturing the central theme, Factor 1 was labelled *planning*. For Factor 2 the order of factor loadings was 'international experience' (N.B. extremely high loading of .957), 'business/academic distinction' and 'industry experience'. Factor 2 was labelled *international business experience*.

For Factor 3 the order was 'willingness to commit resources internationally', 'determination/tenacity', 'international vision', 'international open-mindedness' and 'commitment to be an industry leader'. Factor 3 was labelled *international commitment*. Finally, Factor 4 had only one variable that was significant, 'focus on income generation/cash flow'. Factor 4 was labelled *income focus*.

The final step involves the formation of summated scales based on the factor analysis results, which will replace the original 17 variables with four new composite variables, thereby simplifying subsequent multiple regression analysis. To create the new variables the values of each significant original variable highlighted in the previous paragraph are averaged for each factor (Hair et al., 1998). For example, the values of each observation of the four original variables comprising Factor 1 are summed and divided by four to arrive at average values, thereby creating a single composite measure. The new composite measures were then tested for reliability by examining the internal consistency amongst its underlying variables in order to ensure that these indicators were all measuring the same construct and were highly intercorrelated. Since Factor 4 had only one underlying variable, tests to determine internal consistency are not applicable and cannot be performed. However, two separate diagnostic measures of reliability were conducted for Factors 1-3. A Cronbach's alpha assessment of the consistency of the summated scales (i.e. composite measures) rendered reliability coefficients of .8113, .8223 and .8124 for the first three factors, with scores above .60 being deemed acceptable for exploratory research, such as in this study (Robinson, Shaver and Wrightsman, 1991). A second reliability test of the inter-item correlations revealed correlations $\geq .33$, .48 and .2935 for the first three factors, with correlations exceeding .30 being considered acceptable (Robinson et al., 1991). The two test results confirm that these founder characteristic summated scales, to be subsequently utilised in multiple regression analysis, meet reliability standards in terms of their internal consistency and their usage is therefore considered to be appropriate.

9.1.2 ORGANISATION CHARACTERISTICS FACTOR ANALYSIS

Summary of Findings: Four organisation characteristic factors were identified and were subsequently labelled as *alliances and networks*, *entrepreneurial/goal driven internal behaviour*, *internationally experienced managers*, and *flexibility/swift response capabilities*.

The second category of independent variables to be factor analysed is organisation characteristics, consisting of 16 original variables. A series of tests were conducted to determine the appropriateness of conducting factor analysis with this set of variables. First, an examination of the correlation data matrix for the variables revealed that a substantial number of correlations exceeding .30 existed and that most correlations were significant, indicating the appropriateness of factor analysis. Second, the Bartlett test of sphericity was highly significant at .000, indicating that factor analysis was appropriate with the set of variables. Third, the MSA for the collective correlation matrix was .759, which indicated a high level of appropriateness. Finally, the MSA for the individual variables indicated an acceptable level of appropriateness (all $\geq .655$). Thus, conducting factor analysis with the organisation characteristic variables can be clearly regarded as being appropriate.

In order to enable convergence for factor analysis extraction, three variables were removed based on low communalities, 'flat organisation' (.242), 'unique intangible asset' (.211) and 'selective international investments' (.261) (Hair et al., 1998). Principal axis factoring was then performed with the remaining variables and resulted in the extraction of four factors. It was decided that the final number of factors to extract for this factor analysis would be four, based on eigenvalues greater than one, the cumulative percentage of total variance explained by the four factors being 65.30% and support from a scree plot analysis.

The factor matrix was then rotated using Promax, which resulted in the pattern matrix exhibited in Table 9.2. The significant factor loadings are in bold font. One

such significant factor loading was removed from the analysis, 'strong accounting/legal functions' under Factor 1, due to a low factor loading (.461) relative to the other significant variables comprising the factor and low communalities (.357) (Hair et al., 1998). For Factor 1 the highest loaded variable was 'tightly networked organisation', followed by 'strategic alliances/joint ventures' and 'utilisation of business/social networks'. Factor 1 was labelled *alliances and networks*. The order of factor loadings for Factor 2 was 'ambitious/goal driven internal behaviour', 'entrepreneurial spirit amongst staff' and 'customer focus'. Factor 2 was labelled *entrepreneurial/goal driven internal behaviour*. For Factor 3 the order of factor loadings was 'internationally experienced managers' followed by 'high quality personnel'. Factor 3 was labelled *internationally experienced managers*. Factor 4 had only one significant factor loading, 'flexibility/swift response capabilities', and was labelled the same, *flexibility/swift response capabilities*.

Organisation Characteristic Variables	Factor			
	1	2	3	4
High Quality Personnel	-.093	.253	.650	-.047
Internationally Experienced Managers	-.026	-.119	.856	-.132
Business Orientation amongst Staff	.080	.195	.361	.107
Strong Accounting/Legal Functions	.461	-.004	.011	.230
Ambitious/Goal Driven Internal Behaviour	.084	.853	.024	-.046
Entrepreneurial Spirit amongst Staff	.026	.820	-.093	.062
Customer Focus	-.032	.544	.098	.203
Strategic Alliances/Joint Ventures	.732	.152	-.022	-.252
Utilisation of Business/Social Networks	.710	.065	-.086	-.103
Tightly Networked Organisation	.793	-.065	.004	.011
Advanced Internal Communications Network	.341	-.183	.229	.326
Flexibility/Swift Response Capabilities	-.140	.141	-.130	.854
Distribution Channel Support	.419	-.021	.035	.294

Table 9.2: Organisation Characteristics Rotated Factor Matrix

The four newly created composite measures or summated scales were then tested for reliability, as determined by internal consistency. Since Factor 4 had only one underlying variable, tests to determine internal consistency are not applicable and can not be performed. However, two separate diagnostic measures of reliability were conducted for Factors 1-3. A Cronbach's alpha assessment of the consistency of the summated scales rendered reliability coefficients of .7352, .8092 and .6031, indicating good reliability for the first two factors and acceptable reliability for the third factor (lower coefficient due to only two variables comprising the factor). Inter-item correlations of $\geq .46$ and .49 for the first two factors and equal to .45 (since only two variables) for the third factor indicated good reliability. The two test results confirm that these organisation characteristic summated scales, to be subsequently utilised in multiple regression analysis, meet reliability standards in terms of their internal consistency and their usage is therefore deemed to be appropriate.

9.1.3 PRODUCT AND MARKETING STRATEGY CHARACTERISTICS FACTOR ANALYSIS

Summary of Findings: Six product and marketing strategy characteristic factors were identified and were subsequently labelled as *continuous innovation, aggressive entry into key foreign markets, unique/innovative products, targeting similar customers world-wide, customer-driven product design, and linked product/service extensions.*

The third category of independent variables to be factor analysed is product and marketing strategy characteristics, consisting of 24 original variables. A series of tests were conducted to determine the appropriateness of conducting factor analysis with the variables. First, an examination of the correlation data matrix for the variables showed that a substantial number of correlations greater than .30 existed and that most correlations were significant, indicating the appropriateness of factor analysis. Second, the Bartlett test of sphericity was highly significant at .000,

indicating that factor analysis was appropriate for the set of variables. Third, the MSA for the collective correlation matrix was .805, which indicated a very high level of appropriateness. Finally, the MSA for the individual variables indicated an acceptable level of appropriateness (all $\geq .536$, with many $> .800$). Thus, conducting factor analysis with the product and marketing strategy characteristic variables can be clearly considered to be appropriate.

In order to enable convergence for factor analysis extraction, one variable was removed based on low communalities, 'university product introduction' (.143) (Hair et al., 1998). Principal axis factoring was then conducted with the remaining variables and resulted in the extraction of six factors. It was decided that the final number of factors to extract for this factor analysis would be six, based on eigenvalues greater than one, the cumulative percentage of total variance explained by the six factors being 59.39% and scree plot analysis support.

The factor matrix was then rotated using Promax, which resulted in the pattern matrix exhibited in Table 9.3. The significant factor loadings are illustrated in bold font. Two such significant factor loadings were removed from the analysis, 'standardised products' and 'customer-favourable collection terms' under Factor 2, due to low communalities (.320 and .303) and all inter-item correlations $< .30$ (Hair et al., 1998). For Factor 1 the highest factor loading was 'continuous innovation', followed by 'follow-on products from same technology', 'expanding breadth of competence' and 'capitalising on learning experiences'. Factor 1 was labelled *continuous innovation*. The order of factor loadings for Factor 2 was 'aggressive foreign market entry', 'perception as a local company' and 'targeting key/leading markets'. Factor 2 was labelled *aggressive entry into key foreign markets*. For Factor 3 the order was 'unique/innovative products', 'differentiated products' and 'pre-emptive technology/marketing'. Factor 3 was labelled *unique/innovative products*. The order for Factor 4 was 'targeting similar customers world-wide' and 'international niche markets'. Factor 4 was labelled *targeting similar customers world-wide*. For Factor 5 the order was 'customer-driven product design' and 'high

quality products'. Factor 5 was labelled *customer-driven product design*. Factor 6 had only one variable, 'linked product/service extensions', and was labelled the same, *linked product/service extensions*.

Product and Marketing Strategy Characteristic Variables	Factor					
	1	2	3	4	5	6
Differentiated Products	-.019	-.036	.579	.181	.098	.109
Unique/Innovative Products	.039	-.226	.780	.090	.169	.082
High Quality Products	.260	-.079	.080	.116	.472	.032
Customer-driven Product Design	.020	.001	-.010	-.005	.717	.090
Narrow Product Line	-.180	.233	.245	-.108	.391	-.078
Standardised Products	-.139	.587	.057	-.169	.201	-.066
Growth Industry	.325	.320	.232	-.128	-.114	-.152
Products Follow Industry Changes/Shifts	.302	.388	.071	-.201	.087	.126
Premium Pricing	.087	.292	.178	-.025	.087	-.117
Customer-favourable Collection Terms	.085	.553	-.148	-.160	.032	.251
Linked Product/Service Extensions	.033	.094	.084	-.082	.070	.633
Clear Marketing Strategy	-.054	.387	.076	.297	-.037	.367
International Niche Markets	.042	.116	.022	.436	.106	-.113
Targeting Similar Customers World-wide	-.001	-.097	.179	.578	-.063	-.002
Pre-emptive Technology/Marketing	.310	.043	.545	.053	-.202	-.044
Aggressive Foreign Market Entry	-.080	.576	.189	.174	-.178	.075
Targeting Key/Leading Markets	-.146	.459	.116	.325	.000	-.116
Perception as a Local Company	.001	.537	-.208	.128	-.037	.098
International Trade Shows	.146	.415	-.262	.207	.014	-.087
Continuous Innovation	.831	-.073	.128	-.130	-.093	.090
Follow-on Products from Same Technology	.792	-.065	.030	-.014	.017	.009
Expanding Breadth of Competence	.687	-.005	-.034	.225	.046	-.029
Capitalising on Learning Experiences	.549	.182	-.034	.188	.167	-.081

Table 9.3: Product and Marketing Strategy Characteristics Rotated Factor Matrix

The six newly created composite measures or summated scales were then tested for reliability, as determined by internal consistency. Since Factor 6 had only one underlying variable, tests to determine internal consistency are not applicable and cannot be performed. However, two separate diagnostic measures of reliability were conducted for Factors 1-5. A Cronbach's alpha assessment of the consistency of the summated scales rendered reliability coefficients of .8593, .6832, .7378, .5394 and .6580, indicating good reliability for Factors 1 and 3 and acceptable reliability for Factors 2, 4 and 5 (N.B. lower coefficients for Factors 4 and 5 due to only two variables comprising each factor, but nevertheless acceptable since exploratory). Inter-item correlations of $\geq .46$, $\geq .35$, $\geq .43$, .3693 and .5005 for Factors 1-5 indicated good reliability. The two test results confirm that these product and marketing strategy characteristic summated scales, to be subsequently utilised in multiple regression analysis, meet reliability standards in terms of their internal consistency and their usage is therefore considered to be appropriate.

9.1.4 PERFORMANCE INDICATOR FACTOR ANALYSIS

Summary of Findings: All five performance indicator variables loaded significantly on one factor, which was subsequently labelled *international performance composite measure*.

The final set of variables to be factor analysed is the five performance indicators that represent the dependent variables in the subsequent multiple regression analysis. The objective of conducting factor analysis with this set of variables was to determine if composite measures of performance could be constructed and thereby be statistically supported. A series of tests were conducted to determine the appropriateness of conducting factor analysis with this set of variables. First, an examination of the correlation data matrix for the variables revealed that most of the correlations exceeded .30 and were significant, indicating the appropriateness of factor analysis. Second, the Bartlett test of sphericity was highly significant at .000, indicating that

factor analysis was appropriate with the set of variables. Finally, the MSA for the collective correlation matrix was .750, which indicated a high level of appropriateness. Thus, conducting factor analysis with the performance indicator variables can be regarded as being appropriate.

Principal axis factoring was then performed and resulted in the extraction of a single factor. The factor had an eigenvalue of 2.92 and explained 58.41% of the total variance. Since only one factor was extracted, rotation techniques can not be conducted. Examination of the factor matrix, exhibited in Table 9.4, revealed that all five indicator variables loaded significantly on the factor. This result was particularly noteworthy, since it allowed all five indicators to be summated to form a single composite measure of performance, which in turn served to reduce measurement error and encompass a multidimensional perspective of performance. The values of the five performance indicators were standardised using z-scores, in order for all five measurement scales to be based on the same measure (i.e. number of standard deviations above or below the mean), prior to summing the scale. This newly created variable was labelled *international performance composite measure*. The new composite measure or summated scale was then tested for reliability, as determined by internal consistency. A Cronbach's alpha assessment of the consistency of the scale resulted in a reliability coefficient of .8092, indicating a high level of reliability. All the inter-item correlations well exceeded the .30 acceptability threshold except two (.2779 and .1184). Overall, the scale was deemed to have adequately met reliability standards and was utilised in subsequent multiple regression analysis.

Performance Indicator Variables	Factor 1
Success Rating of International Sales Growth	.879
Success Rating of International Profit Growth	.918
Extent Achieved Initial International Strategic Objectives	.696
International Sales Growth over First Five Years	.447
International Profitability over First Five Years	.494

Table 9.4: Performance Indicator Factor Matrix

9.2 MULTIPLE REGRESSION ANALYSIS

As illustrated in the previous section, factor analysis reduced the number of variables to be included in the multiple regression analysis to an acceptable level, thereby enabling the analysis to commence. The objective for conducting multiple regression analysis was to determine which set of founder, organisation and product and marketing strategy characteristics (i.e. independent variables) are the best predictors of performance (i.e. dependent variable; 5 indicators individually plus composite measure) for small high technology international start-ups, which answers Research Question 1b. Multiple regression enables the simultaneous assessment of the relationships between each independent variable and the dependent variable and in so doing determines the relative importance of each independent variable. As part of this process, Pearson correlation analysis determines which characteristic variables are significantly correlated with performance as well as the magnitude and direction (i.e. positive or negative) of the relationship, thereby answering Research Question 1a. Finally, analysis of the UK and US international start-up sub-sample results will enable the identification of differences between the two, which answers Research Question 1c.

To recap, the four founder characteristic independent variables to be included in the multiple regression analysis, based on factor analysis results, are *planning*, *international business experience*, *international commitment* and *income focus*. The

four organisation characteristic independent variables are *alliances and networks*, *entrepreneurial/goal driven internal behaviour*, *internationally experienced managers* and *flexibility/swift response capabilities*. Finally, the six product and marketing strategy characteristic independent variables are *continuous innovation*, *aggressive entry into key foreign markets*, *unique/innovative products*, *targeting similar customers world-wide*, *customer-driven product design* and *linked product/service extensions*.

The five performance indicator dependent variables, to be analysed individually since multiple regression allows solely for the analysis of a single dependent variable, are *success rating of international sales growth* (for the first five years of international activity relative to the company's objectives), *success rating of international profit growth* (for the first five years relative to the company's objectives), *extent achieved initial international strategic objectives* (during the first five years of the company's international activity), *international sales growth rate over first five years* (i.e. average annual growth rate of international sales for the first five years of the company's international activity) and *international profitability over first five years* (of international activity). Additionally, the *international performance composite measure* variable, summated from all five individual performance indicators, is utilised as a dependent variable in the multiple regression analysis.

As a preliminary step in multiple regression analysis, Pearson correlation coefficients were calculated in order to determine the magnitude and direction of the linear relationships between each independent variable and each dependent variable, thereby enabling Research Question 1a to be answered. Pearson correlation matrix tables in this section illustrate the relationships between the founder, organisation and product and marketing strategy characteristic variables and the six performance measures (i.e. five performance indicators and one composite measure) for the UK and US international start-up samples. Pearson coefficients range from -1 (perfect negative relationship) to +1 (perfect positive relationship), with 0 indicating no linear

relationship. The coefficients listed in the tables in bold font indicate significance at a level of $p < .05$ (one-tailed).

Whereas Pearson correlation analysis was utilised to discern significant relationships at the bivariate level, multiple regression analysis was employed to determine which characteristics were the best predictors of performance at the multivariate level, thereby enabling the simultaneous examination of the collective set of independent variables. Accordingly, stepwise estimation was chosen as the method for selecting variables that provide the highest degree of prediction, known as estimating the regression equation. The decision was based in part on it being the most popular sequential approach to selecting variables (Hair et al., 1998). Stepwise regression, a sequential search method, individually assesses each variable for its contribution to the prediction of the dependent variable and is either added to or deleted from the regression model depending on its relative contribution. The regression model and coefficients were deemed to be significant for the F statistic and t value at a significance level of .05. Furthermore, analysis of the residuals, partial regression plots, histograms and normal probability plots for each regression indicated that the assumptions of linearity, homoscedasticity and normality had been met. Sections 9.2.1-9.2.3 delineate the *results* of stepwise estimation for founder, organisation and product and marketing strategy characteristic independent variables with the six dependent variables for both the UK and US international start-up sub-samples. The results are then summarised and *discussed* in Section 9.3.

9.2.1 MULTIPLE REGRESSION ANALYSIS FOR FOUNDER CHARACTERISTICS

Summary of Findings: *International commitment* was found to be the best founder characteristic predictor of performance for UK international start-ups in terms of a firm's assessment of its international sales and profit growth, as well as its overall international performance. *International commitment* was

likewise found to be the best founder characteristic predictor of performance for US international start-ups in terms of the achievement of its initial international strategic objectives, and overall international performance. Additionally, *international commitment together with planning* (N.B. planning had a negative relationship) was found to be the best predictor of performance for US international start-ups in terms of profitability. The results are discussed in Section 9.3.

UK Founder Characteristics

A review of the Pearson correlation matrix in Table 9.5 reveals that while no associations (i.e. coefficients) are particularly strong, five were nevertheless found to be significant. 'International commitment' was found to have slight-to-moderate, albeit significant, positive relationships with 'success rating of international sales growth', 'success rating of international profit growth' and the 'international performance composite measure'. 'Income focus' was found to have a slightly negative significant relationship with 'extent achieved initial international strategic objectives', but a slightly positive significant relationship with 'international profitability over first five years'. Thus, in addressing Research Question 1a, the results for UK international start-ups indicate that a founder's *international commitment* has a significant positive relationship with performance in terms of a firm's assessment of its international sales and profit growth as well as its overall international performance. Furthermore, a founder's *income focus* was found to have a significant negative relationship with the achievement of international strategic objectives, but a significant positive relationship with international profitability. However, while the 'income focus' findings are statistically significant, they lack practical significance since their low correlation coefficients explain little of the variance in the relationships, thereby providing limited substantive value (Diamantopoulos and Schlegelmilch, 1997).

	Performance Measures						
	Success Rating of International Sales Growth	Success Rating of International Profit Growth	Strategic Objectives Initial International	Extent Achieved First Five Years	International Sales Growth Rate over First Five Years	International Profitability over First Five Years	Composite Measure International Performance
Founder Characteristics							
Planning	-.084	.145	-.156	-.076	.101	-.012	
International Business Experience	-.159	-.131	-.116	.006	.045	-.109	
International Commitment	.397	.369	.203	.098	.202	.389	
Income Focus	.049	.194	-.272	-.047	.284	.073	

Table 9.5: Pearson Correlation Matrix for UK International Start-up Founder Characteristics

Stepwise multiple regression was then conducted with the four founder characteristic independent variables and each of the six performance dependent variables (i.e. six separate regression analyses). In three of these analyses significant regression variates were noted. These three analyses are illustrated in Tables 9.6, 9.7 and 9.8, and are individually reviewed below. (N.B. Only multiple regression analyses rendering statistically significant results will be illustrated in this thesis.)

The first significant regression analysis noted was with the founder characteristic independent variables and the 'success rating of international sales growth' dependent variable (see Table 9.6). As illustrated in the table, only one independent variable, international commitment, was found to be a statistically significant predictor and included in the regression model. As can be seen, the F statistic (7.113) and *t* value (2.667) of the regression coefficients were both significant at .011. The correlation coefficient R (.397), coefficient of determination R² (.158), adjusted R² (.136) and the standard error of the estimate (.735) were all within acceptable ranges, although somewhat low. The low values in this regression analysis as well as others presented in this section are likely due in part to the developing nature of this subject area and subsequently the limited knowledge regarding possible success factor variables. Multicollinearity was not noted in the

regression variate since it included only one variable (both tolerance value and variance inflation factor, VIF, were 1.000). Furthermore, multicollinearity was minimal amongst the three excluded independent variables (tolerance values $\geq .899$).

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-2.315	1.048		-2.209	.033		
	International Commitment	.459	.172	.397	2.667	.011	1.000	1.000
N	R	R ²	Adj. R ²	Std. Error of the Estimate	F	Sig.		
40	.397	.158	.136	.735	7.113	.011		

Table 9.6: Multiple Regression Analysis for UK Founder Characteristic Independent Variables and ‘Success Rating of International Sales Growth’ Dependent Variable

The resulting prediction equation, drawn from the unstandardised coefficients data presented in the table, is $Y = -2.315 + .459X_1$, where Y is the dependent variable (i.e. success rating of international sales growth), -2.135 is the constant or intercept (b_0), .459 is the regression coefficient indicating the change in the dependent variable for a unit change in the independent variable and X_1 is the independent variable (i.e. international commitment). Thus, in answering Research Question 1b, the findings for UK international start-ups indicate that a founder’s *international commitment* is the best founder characteristic predictor of performance in terms of a firm’s assessment of its international sales growth.

The second significant regression analysis noted was with the founder characteristic independent variables and the ‘success rating of international profit growth’ dependent variable (see Table 9.7). As illustrated in the table, only international commitment was found to be a significant predictor and included in the model. As

can be seen, the F statistic (5.981) and *t* value (2.446) of the regression coefficients were both significant at .019. The correlation coefficient R (.369), coefficient of determination R² (.136), adjusted R² (.113) and the standard error of the estimate (.836) were all within acceptable ranges. Multicollinearity was not noted in the regression variate since it included only one variable. Furthermore, multicollinearity was negligible amongst the three excluded independent variables (tolerance values ≥ .899).

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-2.602	1.193		-2.181	.035		
	International Commitment	.479	.196	.369	2.446	.019	1.000	1.000
N	R	R ²	Adj. R ²	Std. Error of the Estimate	F	Sig.		
40	.369	.136	.113	.836	5.981	.019		

Table 9.7: Multiple Regression Analysis for UK Founder Characteristic Independent Variables and ‘Success Rating of International Profit Growth’ Dependent Variable

The resulting prediction equation is $Y = -2.602 + .479X_1$, where Y is the dependent variable (i.e. success rating of international profit growth), -2.602 is the constant, .479 is the regression coefficient and X₁ is the independent variable (i.e. international commitment). Thus, in answering Research Question 1b, the findings for UK international start-ups indicate that a founder’s *international commitment* is the best founder characteristic predictor of performance in terms of a firm’s assessment of its international profit growth.

The third significant regression analysis noted was with the founder characteristic independent variables and the ‘international performance composite measure’ dependent variable (see Table 9.8). As illustrated in the table, only international

commitment was found to be a significant predictor and included in the model. As can be seen, the F statistic (6.794) and *t* value (2.606) of the regression coefficients were both significant at .013. The correlation coefficient R (.389), coefficient of determination R² (.152), adjusted R² (.129) and the standard error of the estimate (.511) were all within acceptable ranges. Multicollinearity was not noted in the regression variate since it included only one variable. Furthermore, multicollinearity was minimal amongst the three excluded independent variables (tolerance values ≥ .899).

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-1.607	.729		-2.205	.034		
	International Commitment	.312	.120	.389	2.606	.013	1.000	1.000
N	R	R ²	Adj. R ²	Std. Error of the Estimate	F	Sig.		
40	.389	.152	.129	.511	6.794	.013		

Table 9.8: Multiple Regression Analysis for UK Founder Characteristic Independent Variables and ‘International Performance Composite Measure’ Dependent Variable

The resulting prediction equation is $Y = -1.607 + .312X_1$, where Y is the dependent variable (i.e. international performance composite measure), -1.607 is the constant, .312 is the regression coefficient and X₁ is the independent variable (i.e. international commitment). Thus, in answering Research Question 1b, the findings for UK international start-ups indicate that a founder’s *international commitment* is the best founder characteristic predictor of overall international performance.

US Founder Characteristics

The correlation matrix for the US international start-up sample is illustrated in Table 9.9. As indicated by the bold font, two characteristics were found to be significantly correlated with performance ($p < .05$). 'Planning' was found to have a slight-to-moderate negative relationship with 'success rating of international profit growth' and 'international profitability over first five years', while 'international commitment' was found to have a slight-to-moderate positive relationship with 'success rating of international profit growth', 'extent achieved initial international strategic objectives' and 'international performance composite measure'. Thus, in answering Research Question 1a with regards to US founder characteristics, *planning* has a significant negative correlation with performance in terms of profitability and *international commitment* has a significant positive relationship with performance overall as well as specifically with a firm's assessment of its profit growth and the achievement of its strategic objectives.

Founder Characteristics	Performance Measures					
	Success Rating of International Sales Growth	Success Rating of International Profit Growth	Extent Achieved Initial International Strategic Objectives	International Sales Growth Rate over First Five Years	International Profitability over First Five Years	Composite Measure International Performance
Planning	-.099	-.276	.013	.045	-.346	-.174
International Business Experience	-.136	-.099	.069	.025	.016	-.031
International Commitment	.246	.378	.391	.151	.259	.374
Income Focus	.128	.235	.244	-.011	.186	.204

Table 9.9: Pearson Correlation Matrix for US International Start-up Founder Characteristics

Multiple regression analyses with the four founder characteristic independent variables and the six performance dependent variables were then performed, which led to the identification of four significant regression variates. The first significant regression variate noted was with the 'success rating of international profit growth'

dependent variable (see Table 9.10). As illustrated in the table, both international commitment and planning were found to be significant predictors, as shown in Model 2. As can be seen in Model 2, the F statistic (7.852) was highly significant at .001, while the *t* values (3.420 and -2.862) of the regression coefficients were both highly significant at .002 and .007 (N.B. planning was found to have a negative relationship in the variate). The correlation coefficient *R* (.546), coefficient of determination *R*² (.298), adjusted *R*² (.260) and the standard error of the estimate (.764) were all well within acceptable ranges. Multicollinearity was minimal in the regression variate and within acceptable standards (tolerance value .925 and VIF 1.081) (Hair et al., 1998). Although a limited degree of multicollinearity was present with the two excluded independent variables (tolerance values of .773 and .794 with corresponding VIFs of 1.293 and 1.259), the impact on the regression variate for the included variables was considered to be minimal since the correlations for the excluded variables were low (Hair et al., 1998).

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-1.873	.927		-2.019	.051		
	International Commitment	.399	.159	.378	2.514	.016	1.000	1.000
2	(Constant)	-1.788	.851		-2.101	.042		
	International Commitment	.517	.151	.490	3.420	.002	.925	1.081
	Planning	-.287	.100	-.410	-2.862	.007	.925	1.081

Model	N	R	R ²	Adj. R ²	Std. Error of the Estimate	F	Sig.
1	40	.378	.143	.120	.833	6.320	.016
2	40	.546	.298	.260	.764	7.852	.001

Table 9.10: Multiple Regression Analysis for US Founder Characteristic Independent Variables and ‘Success Rating of International Profit Growth’ Dependent Variable

The resulting prediction equation is $Y = -1.788 + .517X_1 - .287X_2$, where Y is the dependent variable (i.e. success rating of international profit growth), -1.788 is the constant, $.517$ and $-.287$ are the regression coefficients, X_1 is the international commitment independent variable and X_2 is the planning independent variable. Thus, in answering Research Question 1b, the findings for US international start-ups indicate that a founder's *international commitment* and *planning* are the best founder characteristic predictors of performance in terms of a firm's assessment of its international profit growth.

The second significant regression variate noted was with the founder characteristic independent variables and the 'extent achieved initial international strategic objectives' dependent variable (see Table 9.11). As illustrated in the table, only international commitment was found to be a significant predictor and included in the model. As can be seen, the F statistic (6.850) and t value (2.617) of the regression coefficients were both significant at .013. The correlation coefficient R (.391), coefficient of determination R^2 (.153), adjusted R^2 (.130) and the standard error of the estimate (.805) were all within acceptable ranges. Multicollinearity was not noted in the regression variate since it included only one variable. Although a minor degree of multicollinearity was present with two of the three excluded independent variables (tolerance values of .876 and .807 with corresponding VIFs of 1.142 and 1.239), the influence on the regression variate for the included variable was considered to be inconsequential since deviations from acceptable standards were minimal and the correlations for the excluded variables were low.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-1.959	.896		-2.185	.035		
	International Commitment	.401	.153	.391	2.617	.013	1.000	1.000
	N				Std. Error of the Estimate		F	Sig.
	40				.805		6.850	.013

Table 9.11: Multiple Regression Analysis for US Founder Characteristic Independent Variables and 'Extent Achieved Initial International Strategic Objectives' Dependent Variable

The resulting prediction equation is $Y = -1.959 + .401X_1$, where Y is the dependent variable (i.e. extent achieved initial international strategic objectives), -1.959 is the constant, .401 is the regression coefficient and X_1 is the independent variable (i.e. international commitment). Thus, in answering Research Question 1b, the findings for US international start-ups indicate that a founder's *international commitment* is the best founder characteristic predictor of performance in terms of a firm's achievement of its initial international strategic objectives.

The third significant regression variate noted was with the 'international profitability over first five years' dependent variable (see Table 9.12). As illustrated in the table, both planning and international commitment were found to be significant predictors, as shown in Model 2. As can be seen in Model 2, the F statistic (6.346) was highly significant at .004, while the *t* values (-3.059 and 2.594) of the regression coefficients were both significant at .004 and .014 (N.B. planning was found to have a negative relationship in the variate). The correlation coefficient R (.505), coefficient of determination R^2 (.255), adjusted R^2 (.215) and the standard error of the estimate (.777) were all within acceptable ranges. Multicollinearity was minimal in the regression variate and within acceptable standards (tolerance value .925 and VIF

1.081). Although a limited degree of multicollinearity was present with the two excluded independent variables (tolerance values of .773 and .794 with corresponding VIFs of 1.293 and 1.259), the impact on the regression variate for the included variables was deemed to be quite small since the correlations for the excluded variables were low.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.798	.312		2.560	.015		
	Planning	-.240	.105	-.346	-2.276	.029	1.000	1.000
2	(Constant)	-1.316	.865		-1.521	.137		
	Planning	-.312	.102	-.451	-3.059	.004	.925	1.081
	International Commitment	.399	.154	.383	2.594	.014	.925	1.081

Model	N	R	R ²	Adj. R ²	Std. Error of the Estimate	F	Sig.
1	40	.346	.120	.097	.833	5.182	.029
2	40	.505	.255	.215	.777	6.346	.004

Table 9.12: Multiple Regression Analysis for US Founder Characteristic Independent Variables and ‘International Profitability over First Five Years’ Dependent Variable

The resulting prediction equation is $Y = -1.316 - .312X_1 + .399X_2$, where Y is the dependent variable (i.e. international profitability over first five years), -1.316 is the constant, -.312 and .399 are the regression coefficients, X_1 is the planning independent variable and X_2 is the international commitment independent variable. Thus, in answering Research Question 1b, the findings for US international start-ups indicate that a founder’s *planning* and *international commitment* are the best founder characteristic predictors of performance in terms of a firm’s international profitability.

Finally, the fourth significant regression variate noted was with the founder characteristic independent variables and the 'international performance composite measure' dependent variable (see Table 9.13). As illustrated in the table, only international commitment was found to be a significant predictor and included in the model. As can be seen, the F statistic (6.163) and *t* value (2.483) of the regression coefficients were both significant at .018. The correlation coefficient R (.374), coefficient of determination R² (.140), adjusted R² (.117) and the standard error of the estimate (.624) were all within acceptable ranges. Multicollinearity was not noted in the regression variate since it included only one variable. Although a minor degree of multicollinearity was present with two of the three excluded independent variables (tolerance values of .876 and .807 with corresponding VIFs of 1.142 and 1.239), the effect on the regression variate for the included variable was deemed to be inconsequential since deviations from acceptable standards were nominal and the correlations for the excluded variables were low.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-1.338	.694		-1.928	.061		
	International Commitment	.295	.119	.374	2.483	.018	1.000	1.000
	N	R	R ²	Adj. R ²	Std. Error of the Estimate	F	Sig.	
	40	.374	.140	.117	.624	6.163	.018	

Table 9.13: Multiple Regression Analysis for US Founder Characteristic Independent Variables and 'International Performance Composite Measure' Dependent Variable

The resulting prediction equation is $Y = -1.338 + .295X_1$, where Y is the dependent variable (i.e. international performance composite measure), -1.338 is the constant, .295 is the regression coefficient and X₁ is the independent variable (i.e. international

commitment). Thus, in answering Research Question 1b, the findings for US international start-ups indicate that a founder's *international commitment* is the best founder characteristic predictor of overall international performance.

9.2.2 MULTIPLE REGRESSION ANALYSIS FOR ORGANISATION CHARACTERISTICS

Summary of Findings: Having an *entrepreneurial/goal driven internal behaviour* was found to be the best organisation characteristic predictor of performance for UK international start-ups in terms of profitability and overall international performance. Similarly, having an *entrepreneurial/goal driven internal behaviour* was found to be the best organisation characteristic predictor of performance for US international start-ups in terms of a firm's assessment of its international sales growth. The results are discussed in Section 9.3.

UK Organisation Characteristics

Table 9.14 illustrates the Pearson correlation matrix for the UK international start-up sample. As indicated by the bold font, 'entrepreneurial/goal driven internal behaviour' was found to be significantly correlated with performance. Specifically, it has a moderate positive relationship with 'success rating of international sales growth', 'success rating of international profit growth', 'international profitability over first five years' and 'international performance composite measure'. Thus, in answering Research Question 1a with regards to UK organisation characteristics, having an *entrepreneurial/goal driven internal behaviour* has a significant positive relationship with performance overall and especially with profitability and the firm's assessment of its international sales growth.

Organisation Characteristics	Performance Measures					
	Success Rating of International Sales Growth	Success Rating of International Profit Growth	Strategic Objectives Initial International	Extent Achieved First Five Years	International Sales Growth Rate over First Five Years	International Profitability over First Five Years
Alliances and Networks	.041	.194	-.253	.190	.088	.068
Entrepreneurial/Goal Driven Internal Behaviour	.287	.363	.210	.026	.383	.401
Internationally Experienced Managers	.240	.235	.061	-.160	.234	.205
Flexibility/Swift Response Capabilities	.112	.137	-.040	.116	.055	.110

Table 9.14: Pearson Correlation Matrix for UK International Start-up Organisation Characteristics

Multiple regression analyses with the four organisation characteristic independent variables and the six performance dependent variables were then performed, which led to the identification of three significant regression variates. The first significant regression variate noted was with the organisation characteristic independent variables and the 'success rating of international profit growth' dependent variable (see Table 9.15). As illustrated in the table, only entrepreneurial/goal driven internal behaviour was found to be a significant predictor and included in the model. As can be seen, the F statistic (6.070) and *t* value (2.464) of the regression coefficients were both significant at .018. The correlation coefficient R (.363), coefficient of determination R^2 (.132), adjusted R^2 (.110) and the standard error of the estimate (.817) were all within acceptable ranges. Multicollinearity was not noted in the regression variate since it included only one variable. Although a minor degree of multicollinearity was present with two of the three excluded independent variables (tolerance values of .887 and .825 with corresponding VIFs of 1.128 and 1.212), the impact on the regression variate for the included variable was considered to be inconsequential since deviations from acceptable standards were minimal and the correlations for the excluded variables were low.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-1.358	.686		-1.98	.055		
	Entrepreneurial/Goal Driven Internal Behaviour	.299	.121	.363	2.464	.018	1.000	1.000

N	R	R ²	Adj. R ²	Std. Error of the Estimate	F	Sig.
42	.363	.132	.110	.817	6.070	.018

Table 9.15: Multiple Regression Analysis for UK Organisation Characteristic Independent Variables and ‘Success Rating of International Profit Growth’ Dependent Variable

The resulting prediction equation is $Y = -1.358 + .299X_1$, where Y is the dependent variable (i.e. success rating of international profit growth), -1.358 is the constant, .299 is the regression coefficient and X_1 is the independent variable (i.e. entrepreneurial/goal driven internal behaviour). Thus, in answering Research Question 1b, the findings for UK international start-ups indicate that an organisation’s *entrepreneurial/goal driven internal behaviour* is the best organisation characteristic predictor of performance in terms of a firm’s assessment of its international profit growth.

The second significant regression variate noted was with the organisation characteristic independent variables and the ‘international profitability over first five years’ dependent variable (see Table 9.16). As illustrated in the table, only entrepreneurial/goal driven internal behaviour was found to be a significant predictor and included in the model. As can be seen, the F statistic (6.866) and *t* value (2.620) of the regression coefficients were both significant at .012. The correlation coefficient R (.383), coefficient of determination R² (.146), adjusted R² (.125) and the standard error of the estimate (.832) were all within acceptable ranges. Multicollinearity was not noted in the regression variate since it included only one

variable. Although a minor degree of multicollinearity was present with two of the three excluded independent variables (tolerance values of .887 and .825 with corresponding VIFs of 1.128 and 1.212), the effect on the regression variate for the included variable was deemed to be negligible since departures from acceptable standards were minimal and the correlations for the excluded variables were low.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-1.663	.699		-2.38	.022		
	Entrepreneurial/Goal Driven Internal Behaviour	.324	.123	.383	2.620	.012	1.000	1.000

N	R	R ²	Adj. R ²	Std. Error of the Estimate	F	Sig.
42	.383	.146	.125	.832	6.866	.012

Table 9.16: Multiple Regression Analysis for UK Organisation Characteristic Independent Variables and ‘International Profitability over First Five Years’ Dependent Variable

The resulting prediction equation is $Y = -1.663 + .324X_1$, where Y is the dependent variable (i.e. international profitability over first five years), -1.663 is the constant, .324 is the regression coefficient and X_1 is the independent variable (i.e. entrepreneurial/goal driven internal behaviour). Thus, in answering Research Question 1b, the findings for UK international start-ups indicate that an organisation’s *entrepreneurial/goal driven internal behaviour* is the best organisation characteristic predictor of performance in terms of a firm’s international profitability.

The third significant regression variate noted was with the organisation characteristic independent variables and the ‘international performance composite measure’ dependent variable (see Table 9.17). As illustrated in the table, only entrepreneurial/goal driven internal behaviour was found to be a significant predictor and included in the model. As can be seen, the F statistic (7.653) and t value (2.766)

of the regression coefficients were both highly significant at .009. The correlation coefficient R (.401), coefficient of determination R^2 (.161), adjusted R^2 (.140) and the standard error of the estimate (.497) were all within acceptable ranges. Multicollinearity was not noted in the regression variate since it included only one variable. Although a minor degree of multicollinearity was present with two of the three excluded independent variables (tolerance values of .887 and .825 with corresponding VIFs of 1.128 and 1.212), the impact on the regression variate for the included variable was judged to be inconsequential since deviations from acceptable standards were quite small and the correlations for the excluded variables were low.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.854	.417		-2.046	.047		
	Entrepreneurial/Goal Driven Internal Behaviour	.204	.074	.401	2.766	.009	1.000	1.000
N	R	R^2	Adj. R^2	Std. Error of the Estimate	F	Sig.		
42	.401	.161	.140	.497	7.653	.009		

Table 9.17: Multiple Regression Analysis for UK Organisation Characteristic Independent Variables and ‘International Performance Composite Measure’ Dependent Variable

The resulting prediction equation is $Y = -.854 + .204X_1$, where Y is the dependent variable (i.e. international performance composite measure), -.854 is the constant, .204 is the regression coefficient and X_1 is the independent variable (i.e. entrepreneurial/goal driven internal behaviour). Thus, in answering Research Question 1b, the findings for UK international start-ups indicate that an organisation’s *entrepreneurial/goal driven internal behaviour* is the best organisation characteristic predictor of overall international performance.

US Organisation Characteristics

Table 9.18 illustrates the correlation matrix for the US international start-up sample. The matrix shows only one significant relationship. ‘Entrepreneurial/goal driven internal behaviour’ was found to have a moderately positive correlation with ‘success rating of international sales growth’. Thus, in answering research Question 1a with regards to US organisation characteristics, having an *entrepreneurial/goal driven internal behaviour* has a significant positive correlation with performance, specifically with a firm’s assessment of its international sales growth.

Organisation Characteristics	Performance Measures					
	Success Rating of International Sales Growth	Success Rating of International Profit Growth	Strategic Objectives Initial International	Extent Achieved First Five Years	International Sales Growth Rate over First Five Years	International Profitability over First Five Years
Alliances and Networks	.042	-.229	-.058	.120	-.262	-.099
Entrepreneurial/Goal Driven Internal Behaviour	.388	.254	.226	-.070	.068	.218
Internationally Experienced Managers	-.002	-.121	.032	-.143	-.166	-.106
Flexibility/Swift Response Capabilities	-.124	-.043	.031	-.071	-.243	-.116

Table 9.18: Pearson Correlation Matrix for US International Start-up Organisation Characteristics

Multiple regression analyses with the four organisation characteristic independent variables and the six performance dependent variables were then performed, which led to the identification of a single significant regression variate. The significant variate noted was with the organisation characteristic independent variables and the ‘success rating of international sales growth’ dependent variable (see Table 9.19). As illustrated in the table, only entrepreneurial/goal driven internal behaviour was found to be a significant predictor and included in the model. As can be seen, the F statistic (6.723) and *t* value (2.593) of the regression coefficients were both significant at

.013. The correlation coefficient R (.388), coefficient of determination R^2 (.150), adjusted R^2 (.128) and the standard error of the estimate (.800) were all within acceptable ranges. Multicollinearity was not noted in the regression variate since it included only one variable. Furthermore, multicollinearity was very minimal amongst the three excluded independent variables (tolerance values $\geq .958$).

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-1.405	.687		-2.044	.048		
	Entrepreneurial/Goal Driven Internal Behaviour	.315	.121	.388	2.593	.013	1.000	1.000
N	R	R^2	Adj. R^2	Std. Error of the Estimate	F	Sig.		
40	.388	.150	.128	.800	6.723	.013		

Table 9.19: Multiple Regression Analysis for US Organisation Characteristic Independent Variables and ‘Success Rating of International Sales Growth’ Dependent Variable

The resulting prediction equation is $Y = -1.405 + .315X_1$, where Y is the dependent variable (i.e. success rating of international sales growth), -1.405 is the constant, .315 is the regression coefficient and X_1 is the independent variable (i.e. entrepreneurial/goal driven internal behaviour). Thus, in answering Research Question 1b, the findings for US international start-ups indicate that an organisation’s *entrepreneurial/goal driven internal behaviour* is the best organisation characteristic predictor of performance in terms of a firm’s assessment of its international sales growth.

9.2.3 MULTIPLE REGRESSION ANALYSIS FOR PRODUCT AND MARKETING STRATEGY CHARACTERISTICS

Summary of Findings: *Customer-driven product design* was found to be the best product and marketing strategy predictor of performance for UK international start-ups in terms of a firm's assessment of its international sales growth, as well as its overall international performance. Additionally, *customer-driven product design together with targeting similar customers world-wide* was found to be the best predictor of performance for UK international start-ups with regard to a firm's assessment of its international profit growth. Conversely, having *unique/innovative products* was found to be the best product and marketing strategy predictor of performance for US international start-ups in terms of a firm's assessment of its international sales growth, while *continuous innovation* was found to be the best predictor regarding the extent to which a firm achieved its initial international strategic objectives. The results are discussed in Section 9.3.

UK Strategy Characteristics

Table 9.20 illustrates the Pearson correlation matrix for the UK international start-up sample. As indicated in bold font, two characteristic variables were found to be significantly correlated with performance. 'Targeting similar customers world-wide' has slight-to-moderate positive correlations with 'success rating of international profit growth', 'international profitability over first five years' and 'international performance composite measure', while 'customer-driven product design' has a moderate positive relationship with 'success rating of international sales growth', 'success rating of international profit growth' and 'international performance composite measure'. Thus, in answering Research Question 1a with regards to UK product and marketing strategy characteristics, *targeting similar customers world-wide* has a significant positive relationship with performance overall and in particular profitability and *customer-driven product design* has significant positive correlations with overall performance and a firm's assessment of its international sales and profit growth.

Product and Marketing Strategy Characteristics	Performance Measures					
	Success Rating of International Sales Growth	Success Rating of International Profit Growth	Strategic Objectives Initial International	Extent Achieved First Five Years	International Sales Growth Rate over First Five Years	International Profitability over First Five Years
Continuous Innovation	.166	.229	.012	.212	.152	.224
Aggressive Entry into Key Foreign Markets	.040	-.013	.183	.181	-.039	.094
Unique/Innovative Products	.142	.136	-.055	.015	.086	.099
Targeting Similar Customers World-wide	.231	.356	.015	.099	.273	.297
Customer-driven Product Design	.335	.391	.194	.079	.255	.385
Linked Product/Service Extensions	.101	.201	-.259	-.107	.164	.041

Table 9.20: Pearson Correlation Matrix for UK International Start-up Product and Marketing Strategy Characteristics

Multiple regression analyses with the six product and marketing strategy characteristic independent variables and the six performance dependent variables were then performed, which led to the identification of three significant regression variates. The first significant regression variate noted was with the product and marketing strategy characteristic independent variables and the 'success rating of international sales growth' dependent variable (see Table 9.21). As illustrated in the table, only customer-driven product design was found to be a significant predictor and included in the model. As can be seen, the F statistic (4.808) and *t* value (2.193) of the regression coefficients were both significant at .035. The correlation coefficient R (.335), coefficient of determination R^2 (.112), adjusted R^2 (.089) and the standard error of the estimate (.753) were all within acceptable ranges, albeit somewhat low. Multicollinearity was not noted in the regression variate since it included only one variable. Furthermore, multicollinearity was minimal amongst the five excluded independent variables (tolerance values $\geq .934$).

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-1.239	.778		-1.593	.119		
	Customer-Driven Product Design	.299	.136	.335	2.193	.035	1.000	1.000

N	R	R ²	Adj. R ²	Std. Error of the Estimate	F	Sig.
40	.335	.112	.089	.753	4.808	.035

Table 9.21: Multiple Regression Analysis for UK Product and Marketing Strategy Characteristic Independent Variables and ‘Success Rating of International Sales Growth’ Dependent Variable

The resulting prediction equation is $Y = -1.239 + .299X_1$, where Y is the dependent variable (i.e. success rating of international sales growth), -1.239 is the constant, .299 is the regression coefficient and X_1 is the independent variable (i.e. customer-driven product design). Thus, in answering Research Question 1b, the findings for UK international start-ups indicate that the product and marketing strategy characteristic of a *customer-driven product design* is the best predictor of performance in terms of a firm’s assessment of its international sales growth.

The second significant regression variate noted was with the ‘success rating of international profit growth’ dependent variable (see Table 9.22). As illustrated in the table, both customer-driven product design and targeting similar customers worldwide were found to be significant predictors, as shown in Model 2. As can be seen in Model 2, the F statistic (6.259) was highly significant at .005, while the t values (2.502 and 2.221) of the regression coefficients were both significant at .017 and .033. The correlation coefficient R (.503), coefficient of determination R^2 (.253), adjusted R^2 (.212) and the standard error of the estimate (.770) were all within acceptable ranges. Multicollinearity was very minimal in the regression variate and well within acceptable standards (tolerance value .989 and VIF 1.011). Although a

minor degree of multicollinearity was present with two of the four excluded independent variables (tolerance values of .823 and .855 with corresponding VIFs of 1.216 and 1.169), the impact on the regression variate for the included variables was deemed to be inconsequential since deviations from acceptance standards were minimal and the correlations for the excluded variables were low.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-1.900	.835		-2.276	.029		
	Customer-Driven Product Design	.384	.146	.391	2.621	.013	1.000	1.000
2	(Constant)	-3.625	1.111		-3.262	.002		
	Customer-Driven Product Design	.351	.140	.358	2.502	.017	.989	1.011
	Targeting Similar Customers World-wide	.318	.143	.317	2.221	.033	.989	1.011

Model	N	R	R ²	Adj. R ²	Std. Error of the Estimate	F	Sig.
1	40	.391	.153	.131	.808	6.872	.013
2	40	.503	.253	.212	.770	6.259	.005

Table 9.22: Multiple Regression Analysis for UK Product and Marketing Strategy Characteristic Independent Variables and ‘Success Rating of International Profit Growth’ Dependent Variable

The resulting prediction equation is $Y = -3.625 + .351X_1 + .318X_2$, where Y is the dependent variable (i.e. success rating of international profit growth), -3.625 is the constant, .351 and .318 are the regression coefficients, X_1 is the customer-driven product design independent variable and X_2 is the targeting similar customers world-wide independent variable. Thus, in answering Research Question 1b, the findings for UK international start-ups indicate that the product and marketing strategy characteristics of a *customer-driven product design* and *targeting similar customers world-wide* are the best predictors of performance in terms of a firm’s assessment of its international profit growth.

The final significant regression variate noted was with the product and marketing strategy characteristic independent variables and the 'international performance composite measure' dependent variable (see Table 9.23). As illustrated in the table, only customer-driven product design was found to be a significant predictor and included in the model. As can be seen, the F statistic (6.593) and *t* value (2.568) of the regression coefficients were both significant at .014. The correlation coefficient *R* (.385), coefficient of determination *R*² (.148), adjusted *R*² (.125) and the standard error of the estimate (.506) were all within acceptable ranges. Multicollinearity was not noted in the regression variate since it included only one variable. Furthermore, multicollinearity was minimal amongst the five excluded independent variables (tolerance values $\geq .934$).

Model		Unstandardized Coefficients		Standardized Coefficients	<i>t</i>	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-1.063	.523		-2.032	.049		
	Customer-Driven Product Design	.235	.092	.385	2.568	.014	1.000	1.000
N	R	R ²	Adj. R ²	Std. Error of the Estimate	F	Sig.		
40	.385	.148	.125	.506	6.593	.014		

Table 9.23: Multiple Regression Analysis for UK Product and Marketing Strategy Characteristic Independent Variables and 'International Performance Composite Measure' Dependent Variable

The resulting prediction equation is $Y = -1.063 + .235X_1$, where *Y* is the dependent variable (i.e. international performance composite measure), -1.063 is the constant, .235 is the regression coefficient and *X*₁ is the independent variable (i.e. customer-driven product design). Thus, in answering Research Question 1b, the findings for UK international start-ups indicate that the product and marketing strategy characteristic of a *customer-driven product design* is the best predictor of overall international performance.

US Strategy Characteristics

Table 9.24 illustrates the correlation matrix for the US international start-up sample. As the table's bold font indicates, two characteristics were found to have significant correlations with performance. 'Continuous innovation' had a moderately positive relationship with 'extent achieved initial international strategic objectives', while 'unique/innovative products' had a slight-to-moderate positive relationship with 'success rating of international sales growth'. Thus, in answering Research Question 1a with regards to US product and marketing strategy characteristics, *continuous innovation* is significantly correlated with performance in terms of a firm's achievement of its strategic objectives and having *unique/innovative products* is significantly correlated with performance in terms of a firm's assessment of its international sales growth.

Product and Marketing Strategy Characteristics	Performance Measures					
	Success Rating of International Sales Growth	Success Rating of International Profit Growth	Strategic Objectives Initial International	Extent Achieved First Five Years	International Sales Growth Rate over First Five Years	International Profitability over First Five Years
Continuous Innovation	.207	.108	.494	.038	.080	.239
Aggressive Entry into Key Foreign Markets	.124	.008	.097	.051	-.096	.048
Unique/Innovative Products	.321	.016	.170	.061	-.120	.114
Targeting Similar Customers World-wide	-.101	-.209	-.058	-.122	-.255	-.194
Customer-driven Product Design	.025	-.084	-.006	-.158	-.113	-.090
Linked Product/Service Extensions	.181	.040	.070	-.037	.125	.095

Table 9.24: Pearson Correlation Matrix for US International Start-up Product and Marketing Strategy Characteristics

Multiple regression analyses with the six product and marketing strategy characteristic independent variables and the six performance dependent variables were then performed, which led to the identification of two significant regression

variates. The first significant regression variate noted was with the product and marketing strategy characteristic independent variables and the 'success rating of international sales growth' dependent variable (see Table 9.25). As illustrated in the table, only unique/innovative products was found to be a significant predictor and included in the model. As can be seen, the F statistic (4.354) and *t* value (2.087) of the regression coefficients were both significant, albeit marginally, at .044. The correlation coefficient R (.321), coefficient of determination R^2 (.103), adjusted R^2 (.079) and the standard error of the estimate (.815) were all within acceptable ranges, although the adjusted R^2 value was low. As previously discussed, the low values in some of the regression models presented in this section are likely due in part to the developing nature of the subject area and the subsequent limited knowledge of possible success factor variables. Multicollinearity was not noted in the regression variate since it included only one variable. Although multicollinearity was present with four of the five excluded independent variables, particularly two (continuous innovation and customer-driven product design, tolerance values of .674 and .716 with corresponding VIFs of 1.483 and 1.396) while minor with the other two (aggressive entry into key foreign markets and targeting similar customers world-wide, both with tolerance values of .885 and VIFs of 1.130), the impact on the regression variate for the included variable was deemed to be reasonably minimal since the correlations for the excluded variables were low.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-1.124	.732		-1.535	.133		
	Unique/Innovative Products	.273	.131	.321	2.087	.044	1.000	1.000
N	R	R ²	Adj. R ²	Std. Error of the Estimate	F	Sig.		
40	.321	.103	.079	.815	4.354	.044		

Table 9.25: Multiple Regression Analysis for US Product and Marketing Strategy Characteristic Independent Variables and ‘Success Rating of International Sales Growth’ Dependent Variable

The resulting prediction equation is $Y = -1.124 + .273X_1$, where Y is the dependent variable (i.e. success rating of international sales growth), -1.124 is the constant, .273 is the regression coefficient and X_1 is the independent variable (i.e. unique/innovative products). Thus, in answering Research Question 1b, the findings for US international start-ups indicate that the product and marketing strategy characteristic of having *unique/innovative products* is the best predictor of performance in terms of a firm’s assessment of its international sales growth.

The second significant regression variate noted was with the product and marketing strategy characteristic independent variables and the ‘extent achieved initial international strategic objectives’ dependent variable. Two variables, continuous innovation and customer-driven product design, were found to be significant predictors and included in the model. However, substantial multicollinearity was present with the two included variables (tolerance value of .769 and VIF of 1.300). Based on the high level of multicollinearity in the variate and the *t* value of the customer-driven product design variable being marginally significant at .047, a decision was made to omit the customer-driven product design independent variable from the analysis and rerun the multiple regression with the five remaining independent variables (Hair et al., 1998). Table 8.26 illustrates the results of the

revised multiple regression analysis. As can be seen in the table, only continuous innovation was found to be a significant predictor and included in the model. The F statistic (12.234) and *t* value (3.498) of the regression coefficients were both highly significant at .001. The correlation coefficient R (.494), coefficient of determination R² (.244), adjusted R² (.224) and the standard error of the estimate (.794) were all well within acceptable ranges. Multicollinearity was not noted in the regression variate since it included only one variable. Although multicollinearity was present with two of the four excluded independent variables, particularly one (unique/innovative products, tolerance value of .674 and VIF of 1.483) while minor with the other (targeting similar customers world-wide, tolerance value of .875 and VIF of 1.142), the impact on the regression variate for the included variable was deemed to be reasonably minimal since the correlations for the excluded variables were low.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-1.917	.645		-2.974	.005		
	Continuous Innovation	.415	.119	.494	3.498	.001	1.000	1.000
N	R	R ²	Adj. R ²	Std. Error of the Estimate	F	Sig.		
40	.494	.244	.224	.794	12.234	.001		

Table 9.26: Multiple Regression Analysis for US Product and Marketing Strategy Characteristic Independent Variables and 'Extent Achieved Initial International Strategic Objectives' Dependent Variable

The resulting prediction equation is $Y = -1.917 + .415X_1$, where Y is the dependent variable (i.e. extent achieved initial international strategic objectives), -1.917 is the constant, .415 is the regression coefficient and X₁ is the independent variable (i.e. continuous innovation). Thus, in answering Research Question 1b, the findings for US international start-ups indicate that the product and marketing strategy

characteristic of *continuous innovation* is the best predictor of performance in terms of a firm's achievement of its initial international strategic objectives.

9.3 DISCUSSION AND CONCLUSIONS

The previous section identified and described the significant regression models for the three categories of independent variables and the six separate dependent variables for both the UK and US small high technology international start-up samples. A validation process is now required in order to ensure the generalisability of the results to the UK and US populations. Several empirical methods of validating the models exist. The most direct method is to draw another sample from each of the two populations and compare the regression models of the new samples to the original samples for correspondence. However, as is often the case, resource constraints (i.e. limited funds and time) precluded the implementation of this option. Another method involves dividing the two existing samples in half, conducting multiple regression analysis with the new sub-samples and comparing the results. This option was likewise deemed to be unfeasible since the size of the new sub-samples ($n=20$) would be problematic for conducting multiple regression analysis (Hair et al., 1998). Still another validation method, which was ultimately selected for utilisation in this study, involves a review of the adjusted R^2 values for each of the estimated regression models in order to ensure that they are not 'overfitted' to the samples. Since the adjusted R^2 values for each of the models do not indicate overfitting due to an acceptable ratio of observations-to-variables in each regression variate being maintained (40-1 or 20-1), it was concluded that the models were representative of the two underlying populations and not specific to the samples (Hair et al., 1998).

This chapter addressed Research Question 1, the primary research question of this thesis. Up to this point, parts 1a and 1b have been answered. This section summarises the underlying findings for these sub-questions as well as responds to the final part, 1c, which seeks to determine if differences exist between the findings for

UK and US international start-ups. Additionally, the support of the findings for Proposition 1 will be discussed.

A summary of the Pearson correlation analysis findings for UK and US small high technology international start-ups is illustrated in Table 9.27, thereby answering Research Questions 1a and the corresponding part of 1c. The table displays the positive or negative relationship of each founder, organisation and product and marketing strategy characteristic found to be significantly correlated ($p < .05$, one-tailed) with any of the six performance measures. The following paragraphs provide individual analysis of the findings for the three categories of characteristics.

Characteristics	Performance Measures					
	International Performance Composite Measure	International Profitability over First Five Years	International Sales Growth Rate over First Five Years	Extent Achieved Initial International Strategic Objectives	Success Rating of International Profit Growth	Success Rating of International Sales Growth
Founder: Planning		US -				
International Business Experience						
International Commitment	UK +	UK + US +	US +			UK + US +
Income Focus			UK -			UK +
Organisation: Alliances and Networks						
Entrepreneurial/Goal Driven Internal Behaviour	UK + US +	UK +				UK +
Internationally Experienced Managers						
Flexibility/Swift Response Capabilities						
Product and Marketing Strategy: Continuous Innovation			US +			
Aggressive Entry into Key Foreign Markets						
Unique/Innovative Products	US +					
Targeting Similar Customers World-wide		UK +				UK +
Customer-driven Product Design	UK +	UK +				UK +
Linked Product/Service Extensions						

Table 9.27: Summary of Pearson Correlation Findings for UK and US Small High Technology International Start-ups (significant at $p < .05$, one-tailed)

The first category to be analysed is the founder characteristics of UK and US international start-ups. As can be discerned from the table, the *international commitment* of UK founders was found to have a significant positive correlation with

performance in terms of a firm's assessment of both its international sales and profit growth as well as its overall international performance. Since international commitment was found to be significantly correlated with two performance indicators in addition to the performance composite measure (encompassing two measures of international sales growth, two measures of international profitability and the attainment of initial international strategic objectives), it can be readily concluded that this characteristic is highly correlated with positive performance, both statistically and managerially (i.e. practical relevance). Whereas UK founders' *income focus* was found to have a statistically significant positive correlation with profitability, it had a statistically significant negative correlation with the attainment of initial international strategic objectives. While the positive relationship between focusing on income generation and profitability is intuitively sound, the negative relationship between an income focus and the attainment of initial international strategic objectives is less clear. The negative correlation might stem from the incongruence between concentrating on a financial objective (i.e. income generation) rather than non-financial (i.e. strategic) objectives. This postulate is supported by the survey question (see Question 27 in Appendix B) providing examples of strategic objectives such as to establish a presence in key international markets and to create an international awareness of the product/company. However, both the negative as well as the positive correlations for an income focus lacked practical significance due to their low correlation coefficients (-.272 and .284) and should be examined in future studies before managerial significance is applied.

Somewhat surprisingly, *planning* by US founders was found to have a significant negative relationship with performance in terms of profitability. This finding, as determined by two separate indicators, supports the notion of 'paralysis by analysis', suggesting that excessive planning rather than taking action to launch and market the product/service will ultimately negatively impact profitability. The *international commitment* of US founders was found to have a significant positive relationship with performance in terms of a firm's assessment of its profit growth, attainment of international strategic objectives and overall international performance. The two

performance indicators in tandem with the performance composite measure provide evidence of the characteristic's strong statistical and managerial correlation with performance. Thus, in answering Research Question 1c, the findings indicate that while a founder's international commitment has a significant positive correlation with performance for both UK and US small high technology international start-ups, UK founders' income focus leads to mixed performance results and US founders' planning has a significant negative correlation with performance.

The second category to be analysed is the organisation characteristics of UK and US international start-ups. As can be seen in Table 9.27, an organisation's *entrepreneurial/goal driven internal behaviour* has a significant positive correlation with performance for both UK and US international start-ups. The correlation between this characteristic and performance is particularly strong for UK firms and is both statistically and managerially significant, as evidenced by the significant correlations with three of the five performance indicators (a firm's assessment of both its international sales and profit growth and its profitability) in conjunction with the performance composite measure. For US firms, the characteristic was only significant with one performance measure (a firm's assessment of its international sales growth), thereby exhibiting lesser overall significance than the UK firms. Thus, in responding to Research Question 1c, no substantive differences for UK and US international start-ups were noted with regards to organisational characteristics since an organisation's *entrepreneurial/goal driven internal behaviour* was found to be significantly correlated with performance for both UK and US international start-ups, albeit to a lesser extent for US firms.

The third and final category to be analysed is the product and marketing strategy characteristics of UK and US international start-ups. As shown in Table 9.27, significant positive correlations exist between performance and the UK firms' product and marketing strategy characteristics of *targeting similar customers worldwide* and having a *customer-driven product design*. The overall significance, both statistically and managerially, of these two characteristics is demonstrated by each

being correlated with two performance indicators as well as the broader performance composite measure. Conversely, the product and marketing strategy characteristics of *continuous innovation* and having *unique/innovative products* were found to have significant positive correlations with performance for US firms. However, both were only significantly correlated with a single performance measure (the first characteristic with the achievement of initial international strategic objectives and the second characteristic with a firm's assessment of its international sales growth), thereby indicating lesser overall significance. Thus, in responding to Research Question 1c, the product and marketing strategy characteristics of targeting similar customers world-wide and having a customer-driven product design were found to be significantly correlated with performance for UK international start-ups, while continuous innovation and having unique/innovative products were found to be significantly correlated with performance for US international start-ups.

Having answered Research Questions 1a and the corresponding part of 1c, the focus will now shift to Research Questions 1b and the remaining portion of 1c. Determining correlations between founder, organisation and product and marketing strategy characteristics and performance represents a preliminary bivariate step in multivariate data analysis. While it provides insight into the nature of the individual correlations between the characteristics and performance, multiple regression analysis provides a richer and more comprehensive understanding by analysing the dynamics of the collective set of characteristics. Furthermore, multiple regression analysis renders a quantified prediction model of performance based on the inclusion of one or more of the characteristic variables, thereby providing the best insight into the central research issue of this thesis. While the results of the Pearson correlation findings exhibited in Table 9.27 are similar to those of the multiple regression findings (see Table 9.28), which was expected since correlations play a paramount role in the analysis, more emphasis should be placed on the findings of the latter for the reasons outlined above.

Characteristics Independent Variables	Performance Dependent Variables					
	Success Rating of International Sales Growth	Success Rating of International Profit Growth	Extent Achieved Initial International Strategic Objectives	International Sales Growth Rate over First Five Years	International Profitability over First Five Years	International Performance Composite Measure
Founder: Planning		US -			US -	
International Business Experience						
International Commitment	UK +	UK + US +	US +		US +	UK + US +
Income Focus						
Organisation: Alliances and Networks						
Entrepreneurial/Goal Driven Internal Behaviour	US +	UK +			UK +	UK +
Internationally Experienced Managers						
Flexibility/Swift Response Capabilities						
Product and Marketing Strategy: Continuous Innovation			US +			
Aggressive Entry into Key Foreign Markets						
Unique/Innovative Products	US +					
Targeting Similar Customers World-wide		UK +				
Customer-driven Product Design	UK +	UK +				UK +
Linked Product/Service Extensions						

Table 9.28: Summary of Multiple Regression Findings for UK and US Small High Technology International Start-ups (significant at $p < .05$)

Looking first at the multiple regression findings for the founder characteristics of UK and US international start-ups, Table 9.28 indicates that *international commitment* has a high level of statistical and managerial significance (positive relationship) for

both countries, as evidenced by the characteristic being included in several regression models. International commitment was found to be a significant predictor of performance for three separate performance measures (a firm's assessment of both its international sales and profit growth as well as overall international performance) for UK firms, while for four performance measures (a firm's assessment of its international sales growth, achievement of its international strategic objectives, profitability and overall international performance) for US firms. Thus, the founders' commitment to international business activity, in terms of both resources and spirit, is paramount to the success of the firm's early internationalisation. The prominent role of the founders' international commitment is illustrated in Case Studies Alpha, Beta, Delta and Epsilon (see Chapter 7). Additionally, *planning* was found to be a significant predictor of performance (negative relationship) for US international start-ups in terms of profitability, as indicated by two separate performance measures. Whereas planning is clearly prudent and critical, this finding suggests that excessive planning can have a detrimental effect on profitability since products/services need to be expeditiously introduced and efficiently marketed so that cash flow/income can be generated as rapidly as possible. This finding supports the axiom of 'paralysis by analysis'. Thus, in responding to Research Question 1c, while a founder's international commitment is a key positive predictor of performance for both UK and US international start-ups, planning was found to be a key negative predictor only for US firms. The support of these findings for the literature, along with the support of the other multiple regression findings presented in this section, is discussed in the Conclusion chapter (Section 10.1.5).

The second set of multiple regression analyses to discuss pertains to the organisation characteristics of UK and US international start-ups. As shown in Table 9.28, having an *entrepreneurial/goal driven internal behaviour* was found to be a significant positive predictor of performance for both UK and US firms, although more profoundly for UK firms since it was included in the regression models of three performance dependent variables (two measures of international profitability as well as overall international performance) as opposed to only one for US firms (a firm's

assessment of its international sales growth). This finding suggests that creating and maintaining a company culture encouraging goal attainment and entrepreneurial spirit amongst the staff can enhance the success of the firm. Thus, with regards to Research Question 1c, no differences were found between the organisation predictor findings for UK and US international start-ups, except that the practical significance of the noted predictor was higher for UK firms, as evidenced by its significance with a greater number of performance indicators. The importance of an entrepreneurial/goal driven internal behaviour to success is illustrated in Case Study Delta, which was presented in Chapter 7.

The final set of multiple regression analyses to discuss is with the product and marketing strategy characteristics of UK and US international start-ups. As indicated in Table 9.28, *targeting similar customers world-wide* and having a *customer-driven product design* were both found to be significant positive predictors of performance for UK international start-ups. While the first characteristic was only included in one regression model (a firm's assessment of its international profit growth), the second characteristic had a higher degree of predictive value since it was found to be a significant predictor in three separate models (a firm's assessment of both its international sales and profit growth as well as its overall international performance). These findings suggest the importance to success of targeting similar niche market customers world-wide and of designing products that are high quality and customer-oriented. Conversely, *continuous innovation* and having *unique/innovative products* were found to be significant positive predictors of performance for US international start-ups, although each was included in the model of only one of the six separate performance dependent variables (the first with the achievement of international strategic objectives and the second with a firm's assessment of its international sales growth). These findings highlight the importance to the success of the firm of continual innovation, not relying on an initial product innovation that has a finite life cycle, as well as developing products that are unique and cutting edge. Thus, in answering Research Question 1c, *targeting similar customers world-wide* and having a *customer-driven product design* were found to be significant positive predictors of

performance for UK international start-ups, while continuous innovation and having unique/innovative products were found to be significant positive predictors of performance for US international start-ups. These significant success factors are illustrated in the following case studies (presented in Chapter 7): Delta exemplifies customer-driven product design, Alpha continuous innovation and Alpha and Gamma unique innovative products.

Multiple regression analysis was also conducted with the 'other international firms' in the study (i.e. those not meeting the definitional parameters to be classed as international start-ups) in order to determine if the identified success factors are unique to international start-ups or if they are applicable to all small internationalising firms. The results of the analyses indicated that differences exist. With respect to founder success factors, international commitment had a high level of significance in terms of performance for the UK 'other international firms', which was similar for UK international start-ups. However, both international commitment and international business experience were found to be significant founder success factors for the US 'other international firms', which differs from that of US international start-ups. Regarding organisational success factors, having an entrepreneurial/goal driven internal behaviour and the utilisation of alliances and networks were found to be significant predictors of performance for the UK 'other international firms', while none were significant for the US 'other international firms', which again differs from the factors noted for UK and US international start-ups. Finally, several differences were likewise observed with the product and marketing strategy success factors. Aggressive entry into key foreign markets, targeting similar customers world-wide and having linked product/service extensions (e.g. selling supplies or offering consulting services) were found to be significant success factors for the UK 'other international firms', while having a customer-driven product design and having unique and innovative products were found to be significant for the US 'other international firms'. Thus, these findings suggest that the success factors noted for UK and US international start-ups are somewhat unique,

although it could be argued that they are generally applicable to all small internationalising firms regardless of firm age.

The inclusion of three success factors for the 'other international firms' that were not found for international start-ups can be intuitively explained by the older age of these firms at the time of their initial internationalisation. For example, these firms are more likely to have established and hence utilised alliances and networks as a result of their longer time conducting business prior to internationalisation. Additionally, they are more likely to have acquired greater resources over this time period, which would facilitate the implementation of an aggressive entry into key foreign markets strategy. Finally, these longer established firms are more likely to recognise the importance of having linked product/service extensions in order to generate critical cash flow.

The final topic to discuss before concluding this section is the support of the findings for the corresponding research proposition, Proposition 1. As detailed in Chapter 6, the propositions were based on the eminent findings of prior empirical studies. The three-part research proposition is restated below and the support for each described in the ensuing paragraphs.

Proposition 1: That the founder, organisation and product and marketing strategy characteristics of small high technology international start-ups which are both significantly correlated with performance and the best predictors of performance are:

- a) the founders' international vision, international commitment and strong international business and social networks*
- b) the organisation's internationally experienced managers*
- c) the product and marketing strategies of continuous innovation, operating in niche markets world-wide and having products that are unique, innovative and of high quality.*

Proposition 1a, *that the founders' international vision, international commitment and strong international business and social networks are significantly correlated with performance and the best predictors of performance for small high technology international start-ups* is partially supported by the findings (see Table 9.29). International vision (i.e. international outlook and aspirations) was encompassed in the international commitment factor, as described in Section 9.1.1. Therefore, the findings for UK and US international start-ups show strong support for the international vision and international commitment components of the proposition, both in terms of significant correlations with performance and being the best predictors of performance. However, the strong international business and social networks component, which was encompassed in the planning factor, has limited support. Planning was found to be significantly correlated with performance and a key predictor of performance only for US international start-ups. Furthermore, the relationship was found to be negative, which does not support the findings of Tyebjee (1990) (see Chapter 5). Additionally, founders' income focus was found to be significantly correlated with performance for UK international start-ups.

Founder Characteristics	Significantly Correlated with Performance	Key Predictor of Performance
International Vision	Supported	Supported
International Commitment	Supported	Supported
Strong International Business/Social Networks	Not Wholly Supported	Not Wholly Supported

Table 9.29: Proposition 1a Findings

Proposition 1b, *that the organisation's internationally experienced managers characteristic is significantly correlated with performance and the best predictor of performance for small high technology international start-ups* is not supported by the findings, as illustrated in Table 9.30. Only the organisation characteristic of an entrepreneurial/goal driven internal behaviour was found to be significantly correlated with performance and the best predictor of performance for both UK and

US international start-ups. The statistical insignificance of the organisation's internationally experienced managers in terms of performance is surprising since it was found to be an important success factor for international start-ups by Oviatt and McDougall (1995) and it can be intuitively associated with early internationalisation success.

Organisation Characteristic	Significantly Correlated with Performance	Key Predictor of Performance
Internationally Experienced Managers	Not Supported	Not Supported

Table 9.30: Proposition 1b Findings

Proposition 1c, *that the product and marketing strategies of continuous innovation, operating in niche markets world-wide and having products that are unique, innovative and of high quality are significantly correlated with performance and the best predictors of performance for small high technology international start-ups is not wholly supported* by the findings (see Table 9.31). Continuous innovation was found to be significantly correlated with performance and a predictor of performance solely for US international start-ups. Operating in niche markets world-wide, an underlying variable in the targeting similar customers world-wide factor, was found to be significantly correlated with performance and a predictor of performance only for UK international start-ups. Unique/innovative products was found to be significantly correlated with performance and a predictor of performance for US international start-ups only. Finally, high quality products, a component of the customer-driven product design factor, was found to be significantly correlated with performance and a predictor of performance solely for UK international start-ups.

Product and Marketing Strategy Characteristics	Significantly Correlated with Performance	Key Predictor of Performance
Continuous Innovation	Not Wholly Supported	Not Wholly Supported
Operating in Niche Markets World-wide	Not Wholly Supported	Not Wholly Supported
Unique/Innovative Products	Not Wholly Supported	Not Wholly Supported
High Quality Products	Not Wholly Supported	Not Wholly Supported

Table 9.31: Proposition 1c Findings

CHAPTER 10

CONCLUSION

INTRODUCTION

The principal aim of this thesis was to explore and examine international start-ups, which represent an emerging class of new ventures. Through a review of extant literature, exploratory personal interviews and mail surveys, an understanding of several key dimensions of UK and US small high technology international start-ups was achieved. These dimensions, which encompass the study's research objectives, included the qualitative and quantitative identification of factors influencing their distinctive early internationalisation, their selection of initial country markets and their common early establishment of foreign-based organisational activities, in addition to the identification of other key idiosyncratic characteristics. However, the central focus and primary research objective of this thesis was to identify firm-specific success factors for small high technology international start-ups in order to understand what specific founder, organisation and product and marketing strategy characteristics are correlated with higher relative levels of performance. A framework illustrating each of these dimensions will be presented and discussed in this chapter.

Academic knowledge of international start-ups prior to this research study was markedly limited in nature and largely restricted to a small number of qualitative studies. This project represents one of the first large-scale studies of its kind, incorporating both qualitative and quantitative methodologies. Significant gaps in pre-existing literature were identified regarding the fundamental dimensions noted in the opening paragraph. The foremost contribution of this thesis and underlying research study was the provision of an understanding of these key dimensions of small high technology international start-ups, including the drawing of population inferences by virtue of large sample sizes.

The chapter commences with a review of the support of the findings for the literature, examining previous empirical research as well as theory. A framework depicting the study's findings linked to each of its research questions is presented and discussed. This is followed by a discussion of the implications of the findings for theory, practitioners and policy-makers, as well as specific recommendations for each based on these findings. Finally, the limitations of the study are delineated and areas for future research are identified.

10.1 SUPPORT FOR THE LITERATURE

This section examines the support of the study's findings for existing literature. The study's findings (i.e. factors found to be statistically significant) for each of the research objectives/questions, along with common characteristics and theoretical foundation, are succinctly summarised in the framework of findings for small high technology international start-ups illustrated in Figure 10.1. The framework is segmented into three distinct sequential groupings. The first component pertains to drivers for their formation and emergence and consists of a compilation of factors found to influence small high technology start-ups to be distinctly international in nature at or near inception. The second component represents the established international start-up and is comprised of three categories: common characteristics, factors influencing the selection of initial country markets and factors influencing the common early establishment of foreign-based organisational activities. The final component represents determinants of higher relative performance and illustrates the study's success factor findings for small high technology international start-ups. Moreover, the framework provides a theoretical foundation for the three core components. This section will sequentially examine each of the framework's dimensions so as to determine the support of the findings for the literature.

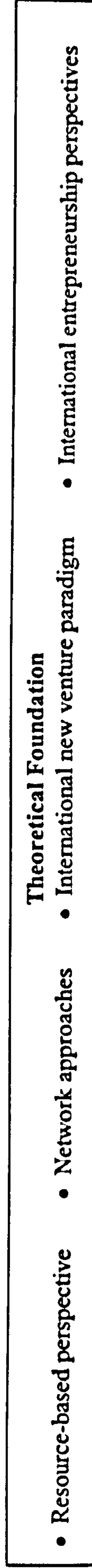
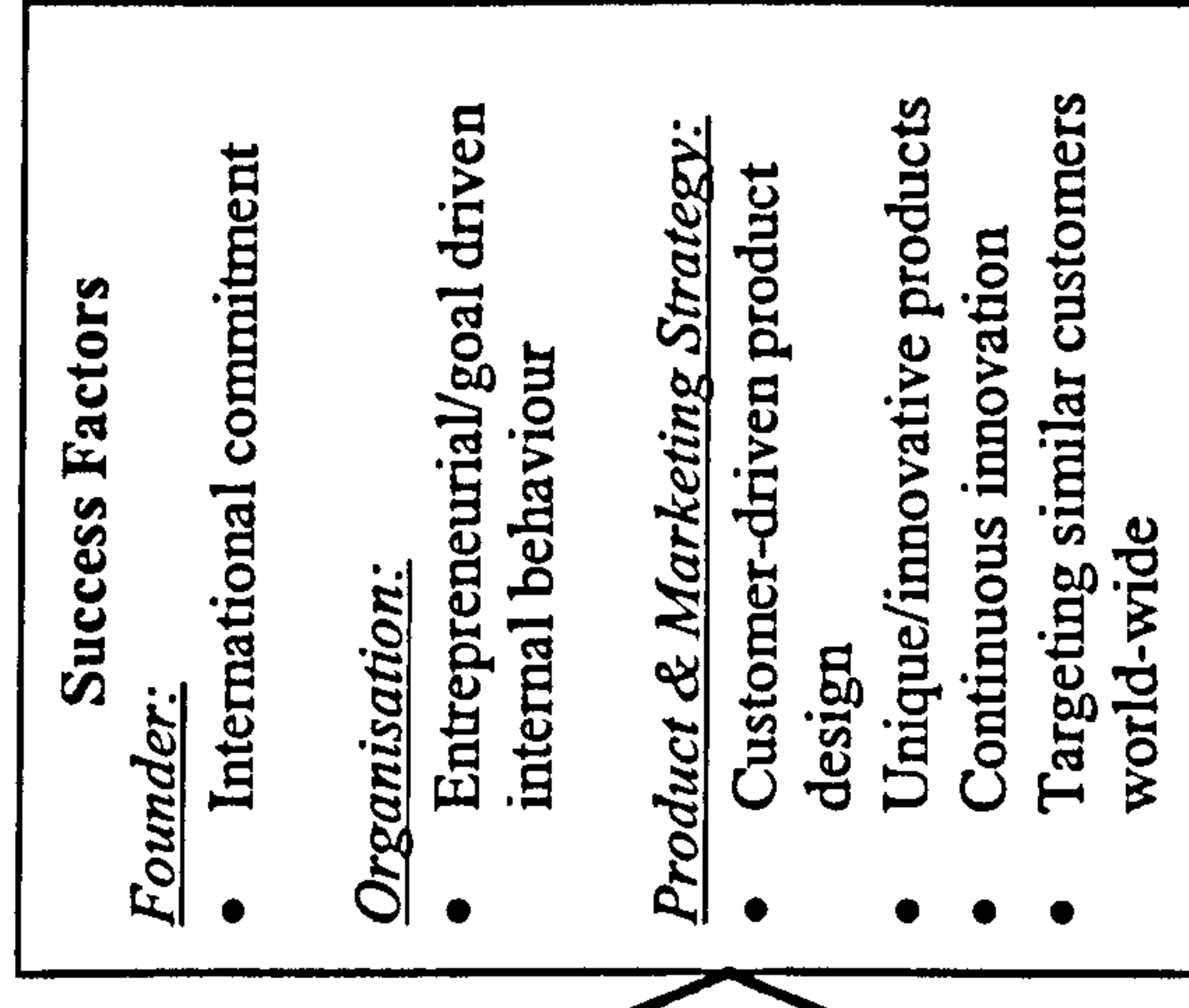
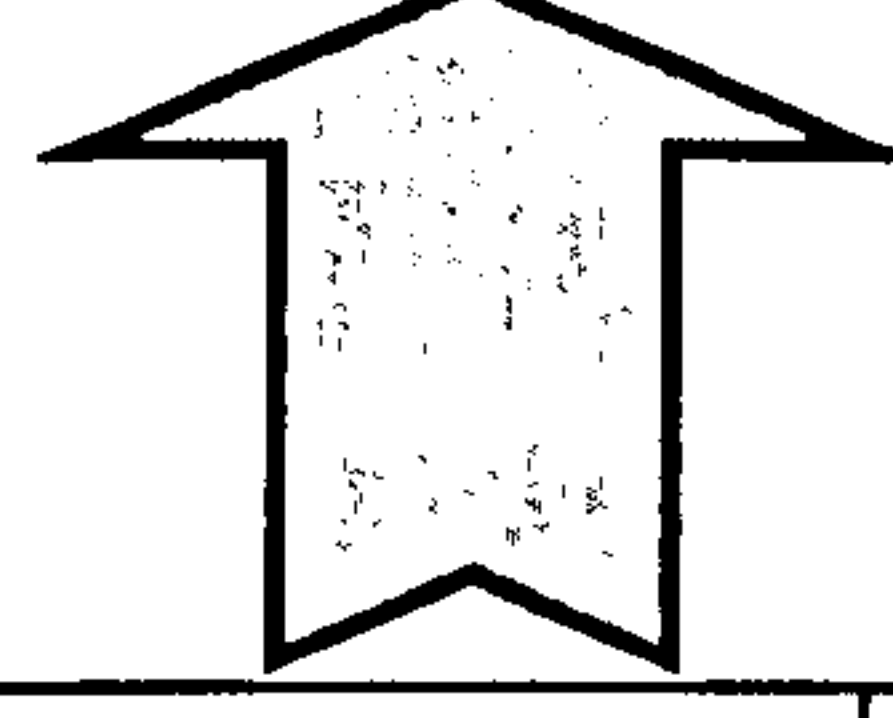
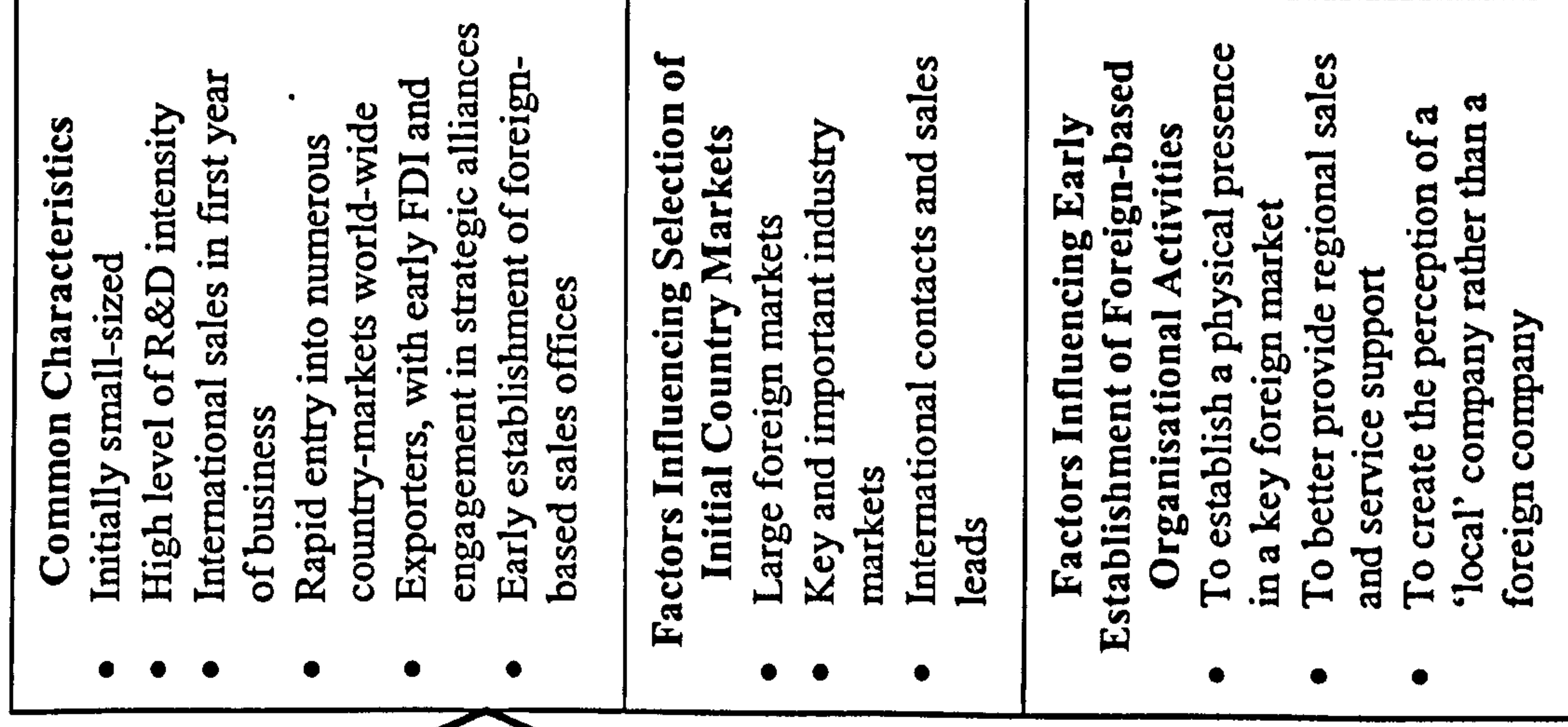
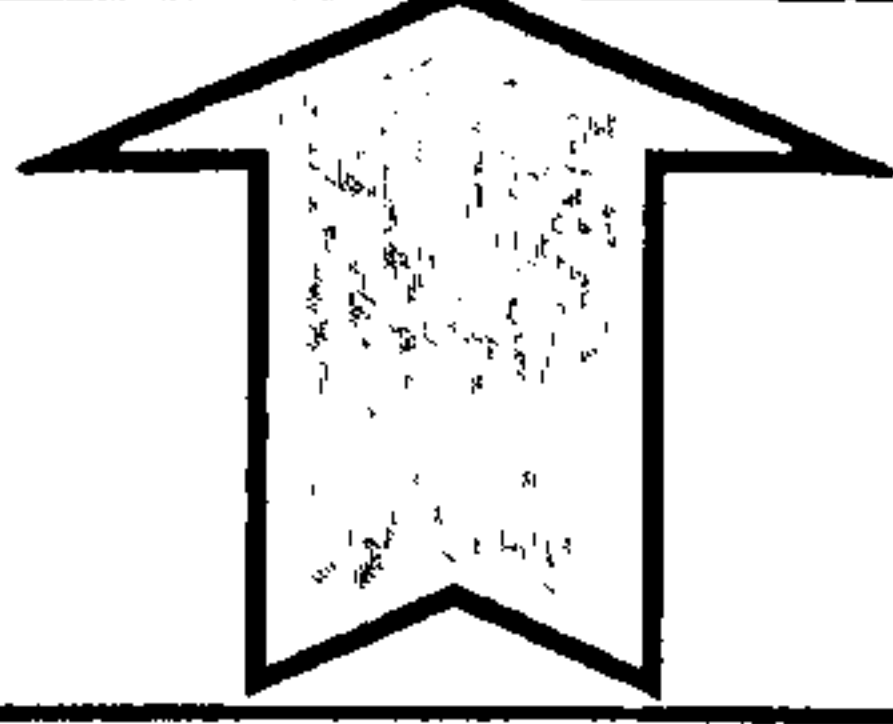
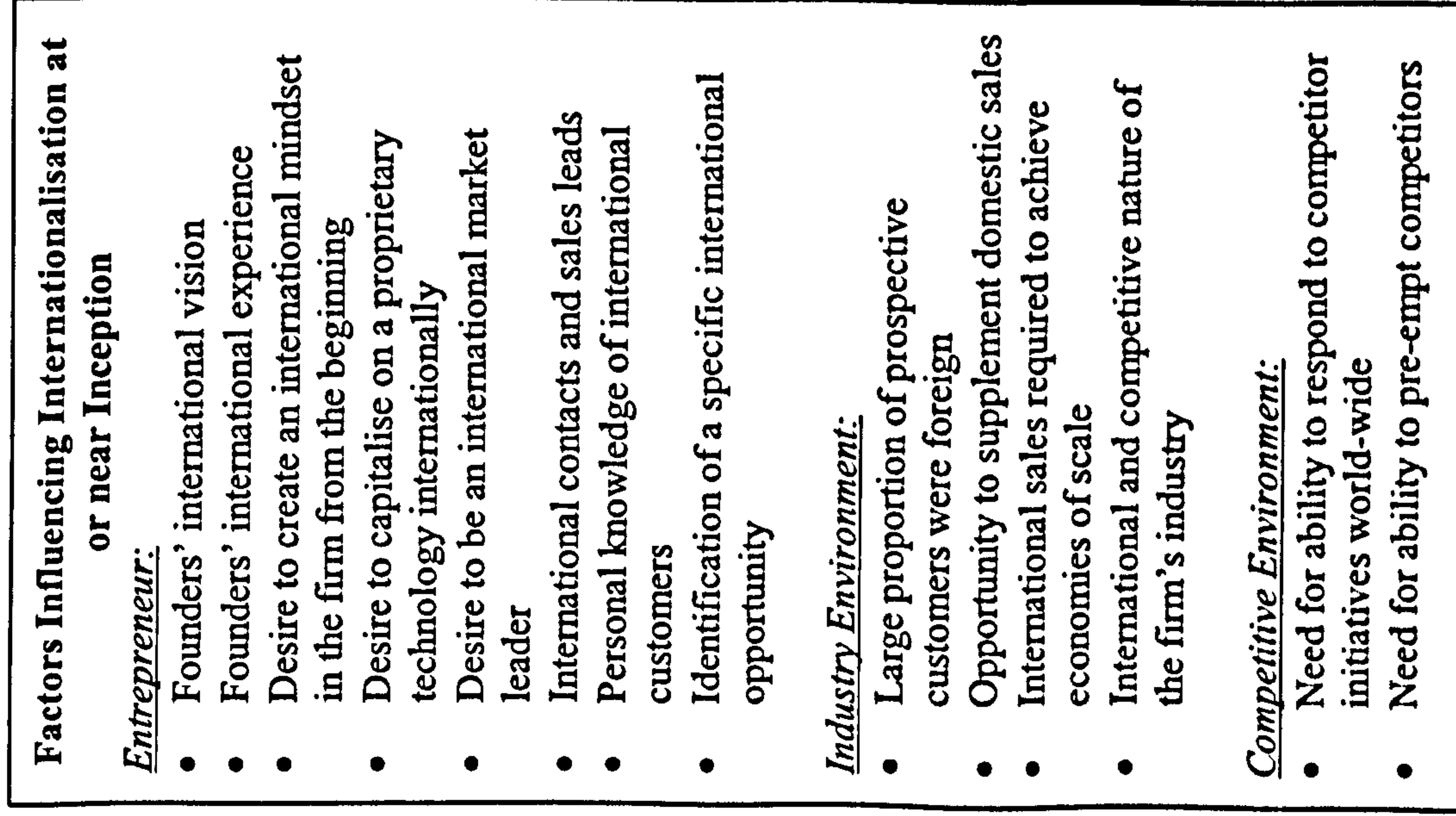


Figure 10.1: Framework of Findings for Small High Technology International Start-ups

10.1.1 FACTORS INFLUENCING SMALL HIGH TECHNOLOGY START-UPS TO BE INTERNATIONAL AT OR NEAR INCEPTION

As can be seen in Figure 10.1, numerous entrepreneur, industry environment and competitive environment factors were found to influence small high technology start-ups to be international at or near inception. While all of the noted factors were found to be statistically significant, the following four factors were found to be particularly influential for both UK and US start-ups: the international vision of the founder(s), the desire to be an international market leader, the identification of a specific international opportunity and the international and competitive nature of the firm's industry. Three of these four factor findings provided support for previous study findings. The international vision of the founder(s) factor supports the findings of McDougall and Oviatt (1991), Oviatt, McDougall, Simon and Shrader (1991, 1993) and Lindqvist (1997). The identification of a specific international opportunity factor supports the findings of McDougall (1989) and Oviatt and McDougall (1994). Finally, the international and competitive nature of the firm's industry factor supports the findings of Litvak (1990), Coviello and Munro (1995) and Bloodgood and Sapienza (1996). The desire to be an international market leader finding was not found in pre-existing literature and therefore represents an especially insightful entrepreneurial factor influencing small high technology start-ups to be distinctly international in nature at or near inception. The collective set of study findings not only provide an understanding of factors influencing the formation of international start-ups, but also provide explanations for their recent emergence.

10.1.2 COMMON CHARACTERISTICS OF SMALL HIGH TECHNOLOGY INTERNATIONAL START-UPS

The framework illustrated in Figure 10.1 delineates six characteristics that were found to be common amongst small high technology international start-ups (see Section 8.1). High technology international start-ups are commonly: small-sized initially, have high levels of R&D intensity, achieve international sales in their first

year of business, rapidly enter numerous country-markets world-wide, engage in exporting with early FDI and utilisation of strategic alliances, and establish foreign-based sales offices early in their existence. These six noted characteristics largely support previous research findings (see for example McDougall, 1989; Litvak, 1990; Jolly, Alahuhta and Jeannet, 1992; Knight and Cavusgil, 1996; Knight, Madsen, Servais and Rasmussen, 2000). However, the study's contribution to academic knowledge with regards to these common characteristics lies with its population inferences pertaining to specific descriptive characteristics (e.g. the frequencies of country-market entry, entry modes and foreign-based organisational activity).

10.1.3 FACTORS INFLUENCING THE SELECTION OF INITIAL COUNTRY MARKETS

As shown in Figure 10.1, the study found that the key factors influencing the selection of initial country markets for both UK and US small high technology international start-ups were: large foreign markets, key and important industry markets and international contacts and sales leads. Chapter 6 described extant literature pertaining to the selection factors for international start-ups as being scant in nature. Nevertheless, the study's findings support those of the limited existing literature (see for example Jolly et al., 1992; Oviatt and McDougall, 1995; Bell, 1995; Lindqvist, 1997). The most common initial country markets entered by UK and US small high technology international start-ups, based largely on the selection factors outlined above, were the UK and US for each other, followed by Germany and France (see Chapter 8).

10.1.4 FACTORS INFLUENCING THE EARLY ESTABLISHMENT OF FOREIGN-BASED ORGANISATIONAL ACTIVITIES

Figure 10.1 identifies three factors/objectives as influencing the common early establishment of foreign-based organisational activities by UK and US small high

technology international start-ups. As discussed in Chapter 6, existing international start-up literature regarding this issue is extremely limited. Nonetheless, the findings of the first two factors/objectives listed, to establish a physical presence in a key foreign market and to better provide regional sales and service support, support the findings of Litvak (1990) and Lindqvist (1997). The final factor/objective found to significantly influence the early establishment of foreign-based organisational activities, to create the perception of a 'local' company rather than a foreign company, is especially noteworthy since it represents a new insight in the international start-up literature. This factor was distinctly noted in the qualitative phase of the study and found to be statistically significant in the quantitative phase.

10.1.5 SUCCESS FACTORS FOR SMALL HIGH TECHNOLOGY INTERNATIONAL START-UPS

The framework illustrated in Figure 10.1 lists the six factors that were found to be positively correlated with performance, as well as the best predictors of performance, for small UK and US high technology international start-ups. Four of these factors were previously identified in the literature. The international commitment of the founder finding supports Lindqvist (1990), Jolly et al. (1992) and Roberts and Senturia (1996). The study's unique and innovative products finding supports Lindqvist (1990), Jolly et al. (1992), Rennie (1993), Oviatt and McDougall (1995) and Bloodgood, Sapienza and Almeida (1995, 1996). The continuous innovation finding supports Lindqvist (1990), Jolly et al. (1992) and Oviatt and McDougall (1995). Finally, the targeting of similar customers world-wide finding supports that of Jolly et al. (1992).

Two of the success factors found in the study were not identified in the literature and are therefore especially noteworthy. Having an entrepreneurial and goal driven internal firm behaviour and having a customer-driven product design were found to be positively correlated with performance for small high technology international start-ups. Both factors were discovered in the study's qualitative phase and found to

be significant predictors of performance in the quantitative phase. These factors, along with the others in the previous paragraph, will be further discussed in Section 10.2.

10.1.6 SUPPORT FOR INTERNATIONALISATION THEORY

Chapter 3 provided a review of theoretical approaches to the internationalisation of the firm so as to facilitate an understanding of the distinctive internationalisation of small international start-ups. Chapter 4 analysed the theoretical approaches with respect to international start-ups and based on extant literature concluded that the resource-based perspective and network approaches to internationalisation provide a partial explanation for international start-ups. It was further concluded that these two frameworks coupled with the constructs of the international new venture paradigm and international entrepreneurship perspectives render a general, albeit limited, understanding of the existence and nature of international start-ups. These findings, based exclusively on the examination of existing literature, support those of Oviatt and McDougall (1994), McDougall, Shane and Oviatt (1994), Shrader, Oviatt and McDougall (1996) and Madsen and Servais (1997).

In conjunction with this analysis of theoretical approaches to internationalisation and existing international start-up literature, several specific dimensions of the theoretical approaches were tested in the quantitative phase of the study. The remainder of this subsection will examine the ensuing findings and determine their degree of support for internationalisation theory.

The study's findings provide little support for the economic approaches to internationalisation (i.e. transaction cost approach, internationalisation theory and the eclectic paradigm) with regards to international start-ups. The objective 'to benefit from lower operational costs' was tested and found to be of little importance as a factor influencing the early establishment of foreign-based organisational activities by UK and US small high technology international start-ups. This is contrary to the

tenets of the economic approaches to internationalisation, and more specifically internalisation theory, which hold that firms choose the least cost location for each activity they perform (Buckley, 1988). However, in support of the transaction cost approach as well as the resource-based perspective (Williamson, 1981; Shan, 1990), small high technology international start-ups were found to utilise alternative governance structures such as strategic alliances and licensing, thereby accessing and conserving critical resources.

The study's findings provide limited support for the network approaches to internationalisation. Johanson and Mattsson's (1988) network model links the internationalisation of a firm to the increasing quantity and quality of foreign network relationships. This thesis study found little support for this postulate, since the influence of small high technology international start-ups' business partners was found to play only a minor role in their initial internationalisation process. The network approaches further hold that the selection of foreign markets is influenced by network relationships (Johanson and Vahlne, 1992; Coviello and Munro, 1997). The study found that network partners do influence the selection of initial foreign markets for small high technology international start-ups, although the importance to the overall selection process is somewhat minimal relative to other factors. While the findings provided only limited support for the network approaches to internationalisation, it is important to note that these findings were based on quantitative data analysis. Due to the complexity of the interorganisational and interpersonal relationships associated with the network approaches to internationalisation, qualitative data would have likely provided a clearer understanding of the influence of network relationships and may have found a higher level of support, as suggested by the literature (for example Sharma and Johanson, 1987; Johanson and Vahlne, 1992; Coviello and Munro, 1997). While this study placed greater emphasis on quantitative methodology, further empirical work utilising qualitative methods is required.

Finally, the study's findings provide no support for the internationalisation process models. The Uppsala model (Johanson and Wiedersheim-Paul, 1975; Johanson and

Vahlne, 1977, 1990) as well as the innovation-related internationalisation process models (Bilkey and Tesar, 1977; Cavusgil, 1980; Reid, 1981; Czinkota, 1982) hold that firms commence with a domestic orientation and gradually internationalise through a series of distinct stages. However, this thesis study found that small high technology international start-ups commence with an international orientation and engage in international activity from the outset, often within their first year (N.B. the mean ages of the UK and US international start-ups at the time of their first international sale was found to be 0.2 and 0.8 years respectively, as described in Chapter 8). Moreover, the study found no support for the Uppsala model tenet that firms enter new country markets with progressively greater psychic distance. Rather, the study found that the psychic distance dimensions of cultural similarities, common language and geographic closeness were of little importance to the selection of initial country markets for small UK and US high technology international start-ups. Thus, international start-ups represent a further formidable challenge, along with other empirical work (for example Turnbull, 1987; Sullivan and Bauerschmidt, 1990; Bell, 1995; Petersen and Pedersen, 1997; Crick and Jones, 2000), to the constructs of traditional internationalisation process models.

10.2 IMPLICATIONS AND RECOMMENDATIONS

The findings of this thesis study have important implications for theory, practitioners and policy-makers. This section examines the implications of the study findings, which are succinctly summarised in Figure 10.1, for these three groups. Specific recommendations stemming from the research findings will likewise be provided for each group.

10.2.1 IMPLICATIONS FOR THEORY

The study's findings have important implications for internationalisation theory. Section 10.1.6 described the support of the findings for several theoretical

approaches to the internationalisation of the firm. This section builds on this foundation by generalising the findings related to each approach, determining the meaning and impact of these findings for theory and providing recommendations where appropriate.

The study found little support for the economic approaches to internationalisation. While limited resources compel small high technology international start-ups to employ transaction cost minimisation and efficiency techniques, such as forming strategic alliances in order to access and conserve critical resources, the economic approaches largely fail to provide an explanation for their unique internationalisation pattern. Internalisation options are greatly restricted due to the inherent resource constraints associated with most small independent start-ups and greatly exacerbated by their international scope. Furthermore, when these firms do internalise and establish foreign-based organisational activities, the decision is not based on the least cost location for the activity, as was also found by McDougall, Shane and Oviatt (1994), but rather on the objectives of establishing a physical presence in a key foreign market, providing enhanced regional sales and service support and creating the perception of a 'local' company as opposed to a foreign company. Thus, internalisation theory and the eclectic paradigm lack substantive relevance and explanatory ability for small high technology international start-ups, while the transaction cost approach has limited relevance and explanatory ability. Moreover, the study illuminated the necessity of modernising and expanding the economic approaches to internationalisation to include higher relevance to small firms, since the study provided clear evidence of the existence and emergence of small, young, resource constrained firms engaged in early globalisation.

The resource-based perspective applied to internationalisation was found to provide a partial explanation for the resource accumulation and internationalisation processes of small high technology international start-ups. In support of the resource-based perspective, these firms were found to engage in strategic alliances and utilise network relationships in order to obtain and conserve critical resources as well as to facilitate their early internationalisation. Despite considerable resource constraints,

small high technology international start-ups are able to enter key foreign markets through the employment of alternative governance structures such as licensing and the establishment of business alliances. Thus, the resource-based perspective provides a partial explanation for the resource access and preservation processes and subsequent internationalisation methods of small high technology international start-ups.

Similarly, the network approaches to internationalisation provide a partial explanation for the internationalisation behaviour of small high technology international start-ups. Whereas specific dimensions of the network approaches were found to have only limited relevance, as noted in the previous section, the notion of establishing networks of inter-firm relationships in order to provide access to critical external resources and facilitate the sale of the firm's products and services was supported by the findings. Thus, the network approaches provide a limited understanding of the business network establishment behaviour of small high technology international start-ups and its impact on their ensuing early internationalisation.

Finally, the tenets of the internationalisation process models were soundly rejected by the study findings. In marked contrast to the models, small high technology international start-ups were found to commence with an international business orientation, engage in early and rapid internationalisation and enter key foreign markets without great regard for psychic distance considerations. Therefore, international start-ups represent a significant challenge to the incremental internationalisation principle of the models and illuminate their limited predictive value. Although the models provide a general understanding of the traditional internationalisation process of a firm, this study in conjunction with the work of other researchers examining international start-ups in relation to the models (see for example McDougall, Shane and Oviatt, 1994; Shrader, Oviatt and McDougall, 1996; Oviatt and McDougall, 1997; Madsen and Servais, 1997) clearly indicate the need to rethink and revise the models in light of contemporary evidence.

Coviello and McAuley (1999) proposed the adoption of an integrative approach to SME internationalisation literature, recognising that frameworks (i.e. FDI theory, stage models and the network perspective) examined independently may not adequately explain the complexities of smaller firm internationalisation. Bell, McNaughton, Young and Crick (2001) likewise recognised the complexity of small firm internationalisation behaviour and proposed an eclectic model that incorporated 'born global firms' in tandem with 'traditional firms' and 'born-again global firms'. Bell et al. (2001) further classified the born global firms as either 'knowledge- and/or service- intensive' or 'knowledge-based' firms in their model, the latter of which incorporates the small high technology international start-ups examined in this thesis study, and recognised the nonlinear state of their internationalisation processes. This study, like those of Coviello and McAuley (1999) and Bell et al. (2001), found that the internationalisation behaviour of small international start-ups is unique, complex and not fully explained by existing internationalisation theory. Rather, it was found that international start-ups are better explained by juxtaposing the international new venture literature with that of the resource-based perspective, network approaches and international entrepreneurship literature. Thus, a multidisciplinary approach to internationalisation theory, incorporating a wide range of frameworks, is recommended in order to enhance the understanding of the distinctive internationalisation activity of small international start-ups.

10.2.2 IMPLICATIONS FOR PRACTITIONERS

The study's findings have significant implications for practitioners. Current and prospective international entrepreneurs can greatly benefit from the study's identification of factors found to influence the early internationalisation, selection of initial country markets and early establishment of foreign-based organisational activities of small high technology international start-ups. The founders and top management teams of small high technology start-ups should analyse the findings (summarised in Figure 10.1) in relation to their specific firm circumstances in order

to enhance their internationalisation strategy evaluation and decision making processes.

The success factor findings of the study have enormous implications for practitioners and are of particular importance. Current and prospective entrepreneurs should first clearly understand that small high technology start-ups can indeed successfully compete internationally from the outset. While they will undoubtedly encounter numerous hurdles and obstacles, the study found that many firms effectively overcome these formidable challenges largely through determination and perseverance and go on to successfully market their products and services world-wide early in their existence. The founders and top management teams of current and prospective international start-ups should meticulously review the study's success factor findings, which were derived from statistical correlation analysis between firm characteristics and performance in a large-scale UK and US study, and implement appropriate strategy emerging from the factors in order to enhance their likelihood of success. The following three paragraphs highlight the founder, organisation and product and marketing strategy characteristics that were found to lead to higher relative levels of performance for small high technology international start-ups and provide a discussion of their implications for founders and managers.

The findings suggest that the founders of small high technology international start-ups should be strongly committed to the internationalisation of their firm in order to promote the success of the venture. This involves the founders' willingness to commit resources to international operations as well as their determination, international vision, international open-mindedness and commitment to be an industry leader. While these findings along with the other findings reviewed in this section were based on quantitative analysis, thereby allowing for population inferences to be drawn, qualitative data facilitates a deeper and richer understanding of the success factors. The study's qualitative findings, stemming from 12 in-depth personal interviews with founders and top managers of UK and US small early internationalising high technology firms, led to the identification of two key founder-related success factors. The interviewees first emphasised the critical need for the

founders to be strongly determined to succeed in spite of all the obstacles they will inevitably encounter and be tenacious and steadfastly seek solutions to these obstacles and 'crises'. Furthermore, the founders' international experience was viewed as a crucial success factor since small high technology start-ups generally possess substantial innovative or technological skills, but greatly lack international business and international marketing knowledge, thereby resulting in an unduly long, arduous and costly learning process. Founders with prior international business experience have a greater propensity of being more open-minded internationally and having an international vision for their new firm as well as are more likely to be committed to internationalisation. Thus, if the start-up company aspires to successfully 'go international' early-on, the founding team should include individuals with prior international experience and all of the founders should have a strong commitment to the firm's internationalisation.

With regards to organisational factors, the findings suggest that the firm should have an entrepreneurial/goal driven internal behaviour in order to enhance its success. This entails the creation and sustenance of an ambitious, goal driven, entrepreneurial and customer-focused company culture. During the interviews with founders and top managers of small early internationalising high technology firms it emerged that the personnel must not only be of very high quality, but also be energised in the company's entrepreneurial spirit and driven towards the firm's success in order to succeed. Therefore, the founders and managers of small high technology international start-ups should take substantive efforts to create and maintain a company culture that fosters this firm-wide ambitious and entrepreneurial spirit, such as through rigorous prospective employee screening, encouraging employee suggestions for business process improvements, and rewarding employees as the firm succeeds.

Finally, the findings suggest that higher levels of performance can be achieved through the implementation of the following product and marketing strategies: having a customer driven product design, having unique and innovative products, engaging in continuous innovation and targeting similar groups of customers world-wide. The study's quantitative and qualitative research found that successful small

high technology international start-ups generally compete in niche markets with innovative products and target homogeneous customer groups located in key industry markets throughout the world. Furthermore, successful firms recognise that their products are often subject to short product life cycles and subsequently do not rely solely on their initial innovation but rather engage in continuous innovation from the beginning. Therefore, it would be highly prudent for the founders and top managers of small high technology international start-ups to take note of these findings and in turn implement appropriate strategies for their firms.

While the success factor findings discussed in this section provide sound, general advice for current and prospective founders and managers of high technology international start-ups, which are based on empirical evidence, the applicability of the identified success factors is dependent upon specific firm and industry sector circumstances. Therefore, individual firm analysis is required. Furthermore, it must be clearly recognised that success factors other than those described in this section exist, and founders and top managers should concurrently examine the findings of other relevant studies (see Chapters 4 and 5). Nevertheless, founders and managers of small high technology international start-ups should methodically review the study's findings and earnestly consider the implementation of the factors in order to enhance the likelihood of their firm's success.

10.2.3 IMPLICATIONS FOR POLICY-MAKERS

Policy-makers around the world are increasingly recognising the importance of developing the international activity of small firms in order to enhance economic development (US SBA, 1993; OECD, 1997; Acs, Morck, Shaver and Yeung, 1997). Furthermore, policy-makers in many countries are currently providing enthusiastic support towards the development of the 'knowledge economy' (Bell et al., 2000). Therefore, this study of small high technology international start-ups, which encapsulates each of these dimensions, is of high relevance to policy-makers. The

study findings have three major implications for policy-makers, which are subsequently described in this section.

The first implication concerns the need to establish and promote support programmes for small high technology international start-ups, which represent an emerging class of new ventures. The founding teams of small high technology international start-ups often have tremendous technical competence but lack in other key dimensions, such as international business knowledge and management and marketing skills, which are essential to successfully launch and build the new firm. The need for support and assistance in these areas was clearly expressed during the study's interviews with founders and top managers of small early internationalising high technology firms. An important finding stemming from the interviews was the recurring identification of the need for an international business mentor who could provide guidance to the firm, due to its inexperience, so as to facilitate successful entry into key foreign markets. Policy-makers should examine the establishment of international business mentoring programmes. More generally, they should become cognisant of the unique needs of young high technology firms in the new global economy in order to provide appropriate support programmes, thereby promoting their success and ultimately advancing the economic development of the community.

The second implication for policy-makers pertains to the need to promote the availability and attainment of requisite financial capital for small high technology international start-ups. The UK founders and top managers that were interviewed were highly critical of the venture capital and investment banking environment in their country, with one founder, whose had substantial UK and US business experience, stating that "funding sources in the US have the attitude of *granting* funding unless they find that they should not, while in the UK they have the attitude of *not granting* funding unless you can prove that they should". The availability of venture capital funding for small high technology firms varies widely between the US and UK, which has major implications for the establishment, development and ultimately the success of the firms. The US venture capital industry represents a dominant and important source of financing for high technology start-ups (Freear and

Wetzel, 1990; Rizzoni, 1991; Murray and Lott, 1995), while the UK venture capital industry has historically been reluctant to invest in high technology firms due to their inherent risk and high failure rate (Sweeting, 1991; Mason and Harrison, 1992; Moore, 1994; Murray and Lott, 1995). Furthermore, corporate venture capital investment in high technology firms is far greater in the US than the UK, with UK corporate interest being minimal in relation to that of the US (Botkin and Matthews, 1992; Block and MacMillan, 1993; McNally, 1994, 1995). However, according to the British Venture Capital Association (2000) the UK venture capital industry has recently increased its investment in high technology start-ups. Hood (2000) similarly noted the shift in focus of public venture capital in Scotland during the 1990s towards early stage financing of high technology firms. The study findings illuminate the need for policy-makers to promote the availability and successful acquisition of venture capital funding. Furthermore, public venture capital entities should continue to represent a viable funding vehicle for small high technology international start-ups in order to foster economic advancement.

The third implication for policy-makers involves the need to establish and promote a platform for the development of international business relationships, which is crucial for small young firms with limited resources who desire to sell their products and services abroad. The study's interview findings highlighted the need of small high technology international start-ups to establish close international business relationships in order to overcome resource and skill deficiencies and successfully market their products in key international locales. In order to foster these critical business relationships, gatherings and communications networks of buyers, sellers, distributors and suppliers within high technology sectors could be established. Policy-makers should recognise this need and take action so as to encourage and enhance the economic wellbeing of these firms and ultimately that of the public.

Scottish Enterprise, the main economic development agency for Scotland, actively promotes the development and growth of start-ups and existing firms through numerous initiatives and provides an excellent illustration of progressive ways in which policy-makers can promote small firm internationalisation. For example, in

1997 Scottish Enterprise commissioned a study of global companies in Scotland and published their findings in a comprehensive report in 1999 entitled Global Companies Enquiry. The report, which included analysis of the barriers and enablers for small knowledge-intensive international firms, was made available to firms in Scotland and led to the initiation of support programmes such the Global Companies Development Process, which is designed to accelerate the successful globalisation process of SMEs. The Process includes the Strategic Globalisation Review, which analyses and advises firms towards successful globalisation, and the Network Process, which provides a forum for networking and the establishment of business relationships. Scottish Enterprise's Globalisation Team is also committed to give Scottish companies better access to required levels of finance. Finally, the newly created Global Connections Strategy for Scotland establishes dynamic programmes designed to support a high level of Scottish firm participation in the global economy and help the firms increase their involvement in global markets. Thus, Scottish Enterprise provides exemplary illustrations of programmes policy-makers can initiate to provide critical support for small high technology international start-ups and thereby not only foster their development and growth but also the economic advancement of their communities.

10.3 LIMITATIONS AND AREAS FOR FUTURE RESEARCH

As with any research, this study has limitations. Although great effort was made to minimise these limitations, several nevertheless remain and need to be clearly identified and discussed since they impact the interpretation of the findings. Whereas several limitations pertaining to specific topics were previously identified in preceding chapters, other general research limitations relating to methodological and data issues need to be addressed. This section describes these limitations and proposes areas for future research to help overcome them.

The first limitation pertains to the cross-sectional nature of the research design. While this research design was the most appropriate for gathering founding-era data

and achieving the study's research objectives, it lacked the richness of longitudinal data, which measures data over a number of time periods, thereby enabling inferences regarding *change*. The rationale for the selection of a cross-sectional research design was that it facilitated an analysis of the characteristics and performance of a firm's early years (i.e. a single point in time encompassing the first five years of its international activity) since the study focused on *start-ups*. Examining the same data for the firms at later points in their business lives would degrade the *start-up* nature of the study since international start-ups in later years are essentially *international companies*. Nevertheless, academic knowledge would be enhanced from longitudinal analysis and future studies should be conducted to obtain this data so as to add a time and process perspective. Specifically, studies should examine the impact of early firm characteristics (i.e. founder, organisation and product and marketing strategy characteristics) on latter year performance as well as changes in these firm characteristics over time. Additionally, the studies should analyse changes in the latter year selection processes of foreign markets and foreign-based organisational activities.

The second limitation relates to the retrospective nature of the study. Data pertaining to the initial years of the firm was sought, leading to respondent recall problems. The validity of the findings was fundamentally dependent upon the accurate recounting of early firm characteristics. Steps were taken to mitigate this problem. First, the sampling frame stipulated that the age of the firms in the sample was not greater than 18 years, so as to facilitate company memory. And second, the covering letter and questionnaire instrument clearly stated that the survey was to be completed by an original founder or member of the top management team with direct knowledge of the founding conditions and characteristics of the firm. While these actions led to highly satisfactory results (189 of the 191 usable responses were completed by founders or top executives with direct founding-era knowledge), the absolute accuracy of the data is nonetheless largely based on memory and is therefore problematic. In order to effectively diminish this limitation, future research studies should narrow their sampling frames to younger firms and limit the respondents to founders.

The third limitation involves the study's rather small sample sizes. Although the overall usable response rates were acceptable (19.25% UK and 18.09% US), albeit a little low, the sizes of the international start-up subsamples were limited. Whereas the sample sizes of the UK and US international start-ups (49 and 45 respectively) were statistically large (i.e. >30), larger samples would be preferable and would strengthen the findings. While recognising that the study was exploratory in nature and that it successfully achieved its objectives, future research studies should strive to obtain larger sample sizes, thereby enhancing the validity of the population inferences.

The fourth limitation relates to sector differences within high technology industries. The study focused on three high technology sectors, namely computer software, computer hardware and electronics. Intuitively, differences exist between the characteristics of firms in each sector, for example in terms of industry and competitive factors influencing their early internationalisation as well as appropriate product and marketing strategies. However, in order to achieve large sample sizes and facilitate higher level statistical analysis, the firms were collectively analysed across sectors. While this accomplished the objective of broadly exploring high technology firms, richer insights could be achieved by examining each sector individually. Future research studies should seek large samples of firms in each sector being examined and identify specific factors for each sector. Furthermore, future research studies should examine other high technology sectors, such as biotechnology, in order to attain a deeper understanding of small high technology international start-ups.

The final limitation pertains to the somewhat low R and R² values in several of the multiple regression models. As was discussed in Chapter 9, these low values are likely due in part to the developing nature of the subject area and the subsequent limited knowledge of possible international start-up success factor variables. This leads to difficulty in measuring and controlling factors, which in turn leads to measurement error. Future studies examining success factors for international start-

ups should focus on enhancing the measurement and control of factors, benefiting from knowledge gained from this study as well as others.

In addition to the aforementioned suggestions regarding areas for future research, a few further suggestions are appropriate. Replication studies should be conducted in order to validate the study findings. Whereas this thesis study was exploratory in nature, future studies should adopt a confirmatory research design. Future studies should also incorporate other countries and industries, including service industries. Finally, further exploratory research focusing on other dimensions of international start-ups is clearly warranted in light of their recent emergence and the limited nature of academic knowledge pertaining to these unique early-internationalising firms. The exploratory research should utilise qualitative techniques in order to facilitate the collection of rich in-depth data and provide a greater depth of understanding.

10.4 CLOSING REMARKS

This study has provided compelling evidence of the existence and emergence of international start-ups. The advent of the information age and the global economy, with its ensuing impact on entrepreneurial orientation and industry competitive environment, has led to the emergence of start-ups that are distinctly international in nature at or near inception (Johnson, 2001). Knowledge-intensive firms have proliferated in this new economy and business environment and have been found to commonly employ more proactive and rapid internationalisation strategies than traditional firms (Bell, Crick and Young, 2000). This evolution represents a paradigm shift away from traditional start-ups with initial domestic focus and gradual internationalisation to that of contemporary start-ups with founding international outlook, orientation and activity. Moreover, the study has determined that small international start-ups can and do succeed and that their success can be enhanced by the presence of certain founder, organisation and product and marketing strategy characteristics. Thus, the age and size of a firm are no longer insurmountable barriers to successful early internationalisation. It is hoped that this study will serve

as a catalyst for future research studies and lead to a clearer understanding of this new business phenomenon.

REFERENCES

Aaby, N.-E. and Slater, S.F. (1989) Management Influences on Export Performance: A Review of the Empirical Literature 1978-88. *International Marketing Review* 6(4), pp7-26.

Aaker, D.A., Kumar, V. and Day, G.S. (1998) *Marketing Research*, 6th Edition. New York: John Wiley.

Acs, Z.J., Morck, R., Shaver, M. and Yeung, B. (1997) The Internationalisation of Small and Medium-Sized Enterprises: A Policy Perspective. *Small Business Economics* 9(1), pp7-20.

Aggarwal, R. (1999) Technology and Globalization as Mutual Reinforcers in Business: Reorienting Strategic Thinking for the New Millennium. *Management International Review* 2(Special Issue), pp83-104.

Almeida, J.G. and Bloodgood, J.M. (1996) Internationalization of New Ventures: Implications of the Value Chain. In: *Frontiers of Entrepreneurship Research*, Babson Park, MA: Babson College.

Alreck, P.A. and Settle, R.B. (1995) *The Survey Research Handbook*. London: Irwin.

Andersen, O. (1993) On the Internationalization Process of Firms: A Critical Analysis. *Journal of International Business Studies* 24(2), pp209-231.

Andersen, O. (1997) Internationalization and Market Entry Mode: A Review of Theories and Conceptual Frameworks. *Management International Review* 37(Special Issue), pp27-42.

Andersen, O. and Kheam, L.S. (1998) Resource-Based Theory and International Growth Strategies: An Exploratory Study. *International Business Review* 7, pp163-184.

Armstrong, J.S. and Overton, T.S. (1977) Estimating Nonresponse Bias in Mail Surveys. *Journal of Marketing Research* 14(August), pp396-402.

Axelsson, B. and Easton, G. (1992) *Industrial Networks: A New View of Reality*. London: Routledge.

Baird, I.S., Lyles, M.A. and Orris, J.B. (1994) The Choice of International Strategies by Small Business. *Journal of Small Business Management* 32(1), pp48-59.

Baker, M.J. (1991) *Research for Marketing*. London: Macmillan.

Bamford, C.E.R., Dean, T.J. and McDougall, P.P. (1996) Initial Founding Conditions and New Firm Performance: A Longitudinal Study Integrating Predictions from Multiple Perspectives. In: *Frontiers of Entrepreneurship Research*. Babson Park, MA: Babson College.

Bank of England - Business Finance Division (1997) Quarterly Report on Small Business Statistics.

Barney, J. (1991) Firm Resources and Sustained Competitive Advantage. *Journal of Management* 17(1), pp99-120.

Bartlett, C.A. (1985) Global Competition and MNC Managers. ICCH Note No. 0-385-287, Harvard Business School, Boston, MA.

Bartlett, C.A. and Ghoshal, S. (1985) The New Global Organization: Differentiated Roles and Dispersed Responsibilities. Harvard Business School Working Paper 9-786-013.

Bartlett, C.A. and Ghoshal, S. (1987) Managing Across Borders: New Strategic Requirements. *Sloan Management Review*, pp7-17.

Bartlett, C.A. and Ghoshal, S. (1989) Managing Across Borders: The Transnational Solution. Boston, MA: Harvard Business School Press.

Beamish, P.W. (1990) The Internationalisation Process for Smaller Ontario Firms: A Research Agenda. In: Rugman, A.M. (ed) *Research in Global Strategic Management - International Business Research for the Twenty-First Century: Canada's New Research Agenda*. Greenwich: JAI Press, pp77-92.

Bell, J. (1995) The Internationalization of Small Computer Software Firms: A Further Challenge to "Stage" Theories. *European Journal of Marketing* 29(8), pp60-75.

Bell, J. (1997) A Comparative Study of the Export Problems of Small Computer Software Exporters in Finland, Ireland and Norway. *International Business Review* 6(6), pp585-604.

Bell, J., Crick, D. and Young, S. (2000) Small Firm Internationalisation and Business Strategy: An Exploratory Study of 'Knowledge-Intensive' and 'Traditional' Manufacturing Firms. Unpublished.

Bell, J., McNaughton, R. and Young, S. (2000) 'Born-Again Global' Firms: An Extension to the 'Born Global' Phenomenon. 2nd Annual McGill Conference on International Entrepreneurship: Reaching New Frontiers, September 23-25, 2000. Montreal, Canada.

Bell, J., McNaughton, R., Young, S. and Crick, D. (2001) Towards an Eclectic Model of Small Firm Internationalisation. 4th McGill Conference on International Entrepreneurship: Reaching New Frontiers, 21-23 September, 2001. Glasgow, Scotland.

Bell, J. and Young, S. (1998) Towards an Integrative Framework of the Internationalisation of the Firm. In: Hooley, G., Loveridge, R. and Wilson, D. (eds) *Internationalisation: Process, Context and Markets*. London: Macmillan, pp5-28.

Bell, J., Young, S. and Crick, D. (1998) A Holistic Perspective on Small Firm Internationalisation and Growth. In: Millar, C.C. and Choi, C.J. (eds) *International Business and Emerging Markets*. London: Academy of International Business, pp9-29.

Bilkey, W.J. and Tesar, G. (1977) The Export Behavior of Smaller Wisconsin Manufacturing Firms. *Journal of International Business Studies* 9(1), pp93-98.

Blankenburg, D. and Johanson, J. (1992) Managing Network Connections in International Business. *Scandinavian International Business Review* 1(1), pp5-19.

Block, Z. and MacMillan, I.C. (1993) Corporate Venturing: Creating New Businesses within the Firm. Boston, MA: Harvard Business School Press.

Bloodgood, J.M., Sapienza, H.J. and Almeida, J.G. (1995) The Internationalization of New High Potential Ventures: Antecedents and Outcomes. In: *Frontiers of Entrepreneurship Research*. Wellesley, MA: Babson College, pp533-546.

Bloodgood, J.M., Sapienza, H.J. et al. (1996) The Internationalization of New High-Potential U.S. Ventures: Antecedents and Outcomes. *Entrepreneurship: Theory & Practice* 20(Summer), pp61-76.

Bolton, B. and Thompson, J. (2000) Entrepreneurs: Talent, Temperament, Technique. Woburn, MA: Butterworth-Heinemann.

Bolton Committee (1971) Small Firms - Report of the Committee of Inquiry on Small Firms. London: H.M.S.O.

Botkin, J.W. and Matthews, J.B. (1992) Winning Combinations: The Coming Wave of Entrepreneurial Partnerships between Large and Small Companies. New York: John Wiley & Sons, Inc.

British Venture Capital Association (2000) Report on Investment Activity.

Brooksbank, R. (1991) Defining the Small Business: A New Classification of Company Size. *Entrepreneurship & Regional Development* 3, pp17-31.

Brush, C.G. (1995) International Entrepreneurship: The Effect of Firm Age on Motives for Internationalization. New York: Garland Publishing, Inc.

Brush, C.G. and Vanderwerf, P.A. (1992) A Comparison of Methods and Sources for Obtaining Estimates of New Venture Performance. *Journal of Business Venturing* 7, pp157-170.

Buckley, P.J. (1988) The Limits of Explanation: Testing the Internalisation Theory of the Multinational Enterprise. *Journal of International Business Studies* 19(2), pp181-193.

Buckley, P.J. (1989) Foreign Direct Investment by Small- and Medium-sized Enterprises: The Theoretical Background. *Small Business Economics* 1, pp89-100.

Buckley, P.J. and Casson, M. (1976) The Future of the Multinational Enterprise. London: Macmillan.

Buckley, P.J. and Chapman, M. (1996) Theory and Method in International Business Research. *International Business Review* 5(3), pp233-245.

Buckley, P.J., Pass, C.L. and Prescott, K. (1988) Measures of International Competitiveness: A Critical Survey. *Journal of Marketing Management* 4(2), pp175-200.

Buckley, P.J., Pass, C.L. and Prescott, K. (1990) Foreign Market Servicing by Multinationals: An Integrated Treatment. *International Marketing Review* 7(4), pp25-40.

Buckley, P.J., Pass, C.L. and Prescott, K. (1990) Measures of International Competitiveness: Empirical Findings from British Manufacturing Companies. *Journal of Marketing Management* 6(1), pp1-13.

Buckley, P.J., Pass, C.L. and Prescott, K. (1992) Measures of International Competitiveness: Empirical Findings from Banks, Building Societies, and Insurance Companies. In: Barrar, P. and Cooper, C.L. (eds) *Managing Organizations in 1992: Strategic Response*. London: Routledge, pp3-20.

Burgel, O. and Murray, G.C. (2000) The International Market Entry Choices of Start-up Companies in High-Technology. *Journal of International Marketing* 8(2), pp33-62.

Butchart, R.I. (1987) A New UK Definition of the High Technology Industries. *Economic Trends* 400(February), pp82-88.

Cantwell, J. (1991) A Survey of Theories of International Production. In: Pitelis, C.N. and Sugden, R. (eds) *The Nature of the Transnational Firm*. London: Routledge, pp16-63.

Carson, D., Cromie, S., McGowan, P. and Hill, J. (1995) Marketing and Entrepreneurship in SMEs: An Innovative Approach. London: Prentice Hall.

- Casson, M. (1982) Transaction Costs and the Theory of the Multinational Enterprise. In: Rugman, A.M. (ed) *New Theories of the Multinational Enterprise*. Beckenham: Croom Helm Ltd., pp24-43.
- Casson, M. (1992) Internalization Theory and Beyond. In: Buckley, P.J. (ed) *New Directions in International Business: Research Priorities for the 1990s*. Aldershot: Edward Elger Publishing Limited, pp4-27.
- Caves, R.E. (1971) International Corporations: The Industrial Economics of Foreign Investment. *Economica* 38(February), pp1-27.
- Cavusgil, S.T. (1980) On the Internationalization Process of Firms. *European Research* 8, pp273-281.
- Cavusgil, S.T. and Elvey-Kirk, L.A. (1998) Mail Survey Response Behaviour - A Conceptualization of Motivating Factors and an Empirical Study. *European Journal of Marketing* 32(11), pp1165-1192.
- Cavusgil, S.T. and Kirpalani, V.H. (1993) Introducing Products into Export Markets: Success Factors. *Journal of Business Research* 27(1), pp1-15.
- Cavusgil, S.T. and Zou, S. (1994) Marketing Strategy-Performance Relationship: An Investigation of the Empirical Link in Export Market Ventures. *Journal of Marketing* 58, pp1-21.
- Chakravarthy, B.S. and Perlmutter, H.V. (1985) Strategic Planning for a Global Business. *Columbia Journal of World Business* (Summer), pp3-10.
- Chandler, G.N. and Hanks, S.H. (1994) Market Attractiveness, Resource-Based Capabilities, Venture Strategies, and Venture Performance. *Journal of Business Venturing* 9, pp331-349.
- Chetty, S.K. and Blankenburg Holm, D. (2000) Internationalisation of Small to Medium-Sized Manufacturing Firms: A Network Approach. *International Business Review* 9(1), pp77-93.
- Chetty, S.K. and Hamilton, R.T. (1993) Firm-level Determinants of Export Performance: A Meta-analysis. *International Marketing Review* 10(3), pp26-34.
- Chisnall, P.M. (1997) *Marketing Research*, 5th Edition. London: McGraw-Hill.
- Churchill, G.A. Jr. (1987) *Marketing Research: Methodological Foundations*. New York: Dryden.
- Coase, R.H. (1937) The Nature of the Firm. *Economica* 4, pp386-405.
- Cole, A. (1942) Entrepreneurship as an Area of Research. *The Tasks of Economic History* (Supplement to the *Journal of Economic History*), pp118-126.

Cooper, A.C. (1993) Challenges in Predicting New Firm Performance. *Journal of Business Venturing* 8(3), pp241-253.

Corsten, H. (1987) Technology Transfer from Universities to Small and Medium-Sized Enterprises - An Empirical Study from the Standpoint of such Enterprises. *Technovation* 6, pp57-68.

Coviello, N. and Munro, H. (1992) Internationalizing the Entrepreneurial Technology-Intensive Firm: Growth Through Linkage Development. In: Churchill et al. (eds) *Frontiers of Entrepreneurship Research*, Wellesley, MA: Babson College, pp430-443.

Coviello, N. and Munro, H. (1997) Network Relationships and the Internationalisation Process of Small Software Firms. *International Business Review* 6(4), pp361-386.

Coviello, N.E., Ghauri, P.N. and Martin, K.A.-M. (1998) International Competitiveness: Empirical Findings from SME Service Firms. *Journal of International Marketing* 6(2), pp8-27.

Coviello, N.E. and McAuley, A. (1999) Internationalisation and the Smaller Firm: A Review of Contemporary Empirical Research. *Management International Review* 39, pp223-244.

Coviello, N.E. and Munro, H.J. (1995) Growing the Entrepreneurial Firm: Networking for International Market Development. *European Journal of Marketing* 29(7), pp49-61.

Crick, D. and Jones, M.V. (2000) Small High-Technology Firms and International High-Technology Markets. *Journal of International Marketing* 8(2), pp63-85.

Crimp, M. (1990) *The Market Research Process*, 3rd Edition. London: Prentice Hall.

Czinkota, M.R. (1982) *Export Development Strategies: US Promotion Policies*. New York: Praeger Publishers.

Deakins, D. (1999) *Entrepreneurship and Small Firms*. London: McGraw-Hill.

Delener, N. (1995) An Integrative Review of Nonresponse Errors in Survey Research: Major Influences and Strategies. *Research in Marketing* 12, pp49-80.

Diamantopoulos, A., Reynolds, N. and Schlegelmilch, B. (1994) Pretesting in Questionnaire Design: The Impact of Respondent Characteristics on Error Detection. *Journal of the Market Research Society* 36(4), pp295-313.

Diamantopoulos, A. and Schlegelmilch, B.B. (1996) Determinants of Industrial Mail Survey Response: A Survey-on-Surveys Analysis of Researchers' and Managers' Views. *Journal of Marketing Management* 12, pp505-531.

- Diamantopoulos, A. and Schlegelmilch, B.B. (1997) Taking the Fear Out of Data Analysis: A Step-by-Step Approach. London: The Dryden Press.
- Dietrich, M. (1994) Transaction Cost Economics and Beyond: Towards a New Economics of the Firm. London: Routledge.
- Douglas, S.P. and Wind, Y. (1987) The Myth of Globalization. *Columbia Journal of World Business* (Winter), pp19-29.
- Dubini, P. (1990) Assessing New Ventures Success. In: Birley, S. (ed) *Building European Ventures*. Amsterdam: Elsevier, pp179-195.
- Duchesneau, D.A. and Gartner, W.B. (1990) A Profile of New Venture Success and Failure in an Emerging Industry. *Journal of Business Venturing* 5, pp297-312.
- Dunning, J.H. (1977) Trade, Location of Economic Activity and the MNE: A Search for an Eclectic Approach. In: Ohlin, B., Hesselborn, P.-O., Wijkman, P.M. (eds) *The International Allocation of Economic Activity*. London: Macmillan, pp395-418.
- Dunning, J.H. (1981) International Production and the Multinational Enterprise. London: Allen & Unwin.
- Dunning, J.H. (1983a) Changes in the Structure of International Production: The Last 100 years. In: Casson, M.C. (ed) *The Growth of International Business*. London: Allen & Unwin.
- Dunning, J.H. (1983b) Market Power of the Firm and International Transfer of Technology. *International Journal of Industrial Organisation* 1, pp333-351.
- Dunning, J.H. (1988) The Eclectic Paradigm of International Production: A Restatement and Some Possible Extensions. *Journal of International Business Studies* 19(1), pp1-31.
- Dunning, J.H. (1991) The Eclectic Paradigm of International Production: A Personal Perspective. In: Pitelis, C.N. and Sugden, R. (eds) *The Nature of the Transnational Firm*. London: Routledge, pp117-136.
- Dunning, J.H. (1993) Multinational Enterprises and the Global Economy. New York: Addison-Wesley.
- Dunning, J.H. (2000) The Eclectic Paradigm as an Envelope for Economic and Business Theories of MNE Activity. *International Business Review* 9(2), pp163-190.
- Easterby-Smith, M., Thorpe, R. and Lowe, A. (1991) Management Research: An Introduction. London: Sage Publications.
- Easton, G. (1992) Industrial Networks: A Review. In: Axelsson, B. and Easton, G. (eds) *Industrial Networks: A New View of Reality*. London: Routledge, pp3-27.

ENSR (1993) The European Observatory for SMEs - First Annual Report. EIM Small Business Research and Consultancy, Zoetermeer, The Netherlands.

Erramilli, M.K. and D'Souza, D.E. (1993) Venturing into Foreign Markets: The Case of the Small Service Firm. *Entrepreneurship: Theory & Practice* 17(Summer), pp29-41.

Felsenstein, D. and Bar-El, R. (1989) Measuring the Technological Intensity of the Industrial Sector: A Methodological and Empirical Approach. *Research Policy* 18, pp239-252.

Fraser, J. and Oppenheim, J. (1997) What's New About Globalization? *The McKinsey Quarterly* 2, pp168-179.

Freear, J. and Wetzel, W.E. (1990) Who Bankrolls High-Tech Entrepreneurs? *Journal of Business Venturing* 5, pp77-89.

Ghoshal, S. (1987) Global Strategy: An Organizing Framework. *Strategic Management Journal* 8, pp425-440.

Ghoshal, S. and Moran, P. (1996) Bad for Practice: A Critique of the Transaction Cost Theory. *Academy of Management Review* 21(1), pp13-47.

Giamartino, G.A., McDougall, P.P. and Bird, B.J. (1993) International Entrepreneurship: The State of the Field. *Entrepreneurship: Theory & Practice* 18, pp37-42.

Giddy, I.H. (1978) The Demise of the Product Cycle Model in International Business Theory. *Columbia Journal of World Business* (Spring).

Goslin, L.N. (1987) Characteristics of Successful High-Tech Start-up Firms. In: Churchill, N.C. et al. (eds) *Frontiers of Entrepreneurship Research*. Wellesley, MA: Babson College, pp452-463.

Graham, E.M. (1975) Oligopolistic Imitation and European Direct Investment. PhD Dissertation, Harvard Graduate School of Business Administration.

Graham, E.M. (1978) Transatlantic Investment by Multinational Firms: A Rivalistic Phenomenon? *Journal of Post-Keynesian Economics* 1(1), pp82-99.

Graham, E.M. (1985) Intra-industry Direct Investment, Market Structure, Firm Rivalry and Technological Performance. In: Erdilek, A. (ed) *Multinationals as Mutual Invaders: Intra-industry Direct Foreign Investment*. London: Croom Helm.

Graham, E.M. (1992) The Theory of the Firm. In: Buckley, P.J. (ed) *New Directions in International Business: Research Priorities for the 1990s*. Aldershot: Edward Elgar Publishing Limited, pp72-80.

Grant, R.M. (1991) The Resource-Based Theory of Competitive Advantage: Implications for Strategy Formulation. *California Management Review* 33(3), pp114-135.

Hadjikhani, A. (1997) A Note on the Criticisms against the Internationalization Process Model. *Management International Review* 37(2), pp43-66.

Hair, J.F. Jr., Anderson, R.E., Tatham, R.L. and Black, W.C. (1998) *Multivariate Data Analysis*. Upper Saddle River, NJ: Prentice Hall.

Hampden-Turner, C. and Trompenaars, F. (1993) *The Seven Cultures of Capitalism*. London: Piatkus.

Hara, G. and Kanai, T. (1994) Entrepreneurial Networks Across Oceans to Promote International Strategic Alliances for Small Business. *Journal of Business Venturing* 9, pp489-507.

Hart, M.M., Stevenson, H.H. and Dial, J. (1995) Entrepreneurship: A Definition Revisited. In: *Frontiers of Entrepreneurship Research*. Babson Park, MA: Babson College.

Hart, S.J. (1987) The Use of the Survey in Industrial Market Research. *Journal of Marketing Management* 3(1), pp25-38.

Hartman, J.J. and Hedblom, J.H. (1979) *Methods for the Social Sciences: A Handbook for Students and Non-Specialists*. Westport: Greenwood.

Harveston, P.D., Kedia, B.L. and Davis, P.S. (2000) Internationalization of Born Global and Gradual Globalizing Firms: The Impact of the Manager. *Advances in Competitiveness Research* 8(1), pp92-99.

Hofer, C.W. and Sandberg, W.R. (1987) Improving New Venture Performance: Some Guidelines for Success. *American Journal of Small Business* 12(Summer), pp11-25.

Hofstede, G. (1980) *Culture's Consequences: International Differences in Work-Related Values*. Beverly Hills: Sage.

Hofstede, G. (1983) The Cultural Relativity of Organizational Practices and Theories. *Journal of International Business Studies* 14(Fall), pp75-89.

Hofstede, G. (1994) The Business of International Business is Culture. *International Business Review* 3(1), pp1-14.

Holzmuller, H.H. and Stottinger, B. (1996) Structural Modeling of Success Factors in Exporting: Cross-Validation and Further Development of an Export Performance Model. *Journal of International Marketing* 4(2), pp29-55.

Hood, N. and Young, S. (1979) *The Economics of Multinational Enterprise*. London: Longman.

- Hood, N. (2000) Public Venture Capital and Economic Development: The Scottish Experience. *Venture Capital* 2(4), pp313-341.
- Hordes, M.W., Clancy, J.A. and Baddaley, J. (1995) A Primer for Global Start-ups. *Academy of Management Executive* 9, pp7-11.
- Hout, T., Porter, M.E. and Rudden, E. (1982) How Global Companies Win Out. *Harvard Business Review* 60, pp98-108.
- Hymer, S. (1968) La Grande Firme Multinationale. *Revue Economique* 19, pp949-973.
- Hymer, S.H. (1976) The International Operations of National Firms: A Study of Direct Foreign Investment. Doctoral Dissertation, MIT. Cambridge, MA.
- Ibrahim, A.B. and Goodwin, J.R. (1986) Perceived Causes of Success in Small Business. *American Journal of Small Business* (Fall), pp41-50.
- Jobber, D. and O'Reilly, D. (1998) Industrial Mail Surveys. *Industrial Marketing Management* 27, pp95-107.
- Jobber, D. and Saunders, J. (1988) An Experimental Investigation into Cross-National Mail Survey Response Rates. *Journal of International Business Studies* 19(3), pp483-489.
- Johanson, J. and Mattsson, L.-G. (1988) Internationalisation in Industrial Systems - A Network Approach. In: Hood, N. and Vahlne, J.E. (eds) *Strategies in Global Competition*. London: Croom Helm, pp287-314.
- Johanson, J. and Vahlne, J.-E. (1977) The Internationalization Process of the Firm-A Model of Knowledge Development and Increasing Foreign Market Commitments. *Journal of International Business Studies* 8(1), pp23-32.
- Johanson, J. and Vahlne, J.-E. (1990) The Mechanism of Internationalisation. *International Marketing Review* 7(4), pp11-24.
- Johanson, J. and Vahlne, J.-E. (1992) Management of Foreign Market Entry. *Scandinavian International Business Review* 1(3), pp9-27.
- Johanson, J. and Wiedersheim-Paul, F. (1975) The Internationalization of the Firm - Four Swedish Cases. *Journal of Management Studies* 12, pp305-322.
- Johnson, J.E. (2001) International Start-ups: A Paradigm Shift for the 21st Century: Two Illustrative Cases Spanning the Atlantic. In: Taggart, J.H., Berry, M., McDermott, M. (eds) *Multinationals in a New Era*. Hampshire: Palgrave, pp61-71.
- Jolly, V.K., Alahuhta, M. and Jeannet, J.-P. (1992) Challenging the Incumbents: How High Technology Start-ups Compete Globally. *Journal of Strategic Change* 1, pp71-82.

- Jones-Evans, D. and Westhead, P. (1996) The High Technology Small Firm Sector in the UK. *International Journal of Entrepreneurial Behavior & Research* 2(1), pp15-35.
- Kamath, S., Rosson, P.J., Patton, D. and Brooks, M. (1987) Research on Success in Exporting: Past, Present and Future. In: Rosson, P.J. and Reid, S.D. (eds) *Managing Export Entry and Expansion*. New York: Praeger, pp398-421.
- Kay, N. (2000) The Resource-Based Approach to Multinational Enterprise. In: Pitelis, C.N. and Sugden, R. (eds) *The Nature of the Transnational Firm*. London: Routledge, pp140-161.
- Kay, N.M. (1991) Multinational Enterprise as Strategic Choice: Some Transaction Cost Perspectives. In: Pitelis, C.N. and Sugden, R. (eds) *The Nature of the Transnational Firm*. London: Routledge, pp137-154.
- Keeble, D., Lawson, C., Smith, H., Moore, B. and Wilkison, F. (1998) Internationalisation Processes, Networking and Local Embeddedness in Technology-Intensive Small Firms. *Small Business Economics* 11(4), pp327-342.
- Keeley, R.H., Roure, J.B., Goto, M. and Yoshimura, K. (1990) An International Comparison of New Ventures. In: Churchill, N.C. et al. (eds) *Frontiers of Entrepreneurship Research*. Babson Park, MA: Babson College, pp472-486.
- Kinncar, T.C. and Taylor, J.R. (1991) *Marketing Research: An Applied Approach*. 4th Edition. New York: McGraw-Hill.
- Knickerbocker, F.T. (1973) *Oligopolistic Reaction and the Multinational Enterprise*. Cambridge, MA: Harvard University Press.
- Knight, G., Madsen, T.K., Servais, P. and Rasmussen, E. (2000) The Born Global Firm: Description and Empirical Investigation in Europe and the United States. American Marketing Association Conference (Winter, 2000).
- Knight, G.A. and Cavusgil, S.T. (1996) The Born Global Firm: A Challenge to Traditional Internationalization Theory. *Advances in International Marketing* 8, pp11-26.
- Kobrin, S.J. (1991) An Empirical Analysis of the Determinants of Global Integration. *Strategic Management Journal* 12, pp17-31.
- Kogut, B. (1985) Designing Global Strategies: Comparative and Competitive Value Added Chains. *Sloan Management Review* 26(4), pp15-28.
- Laitinen, E.K. (1992) Prediction of Failure of a Newly Founded Firm. *Journal of Business Venturing* 7, pp323-340.
- Levitt, T. (1983) The Globalization of Markets. *Harvard Business Review* May-June, pp92-102.

- Lieberman, M.B. and Montgomery, D.B. (1988) First-Mover Advantages. *Strategic Management Journal* 9, pp41-58.
- Lindqvist, M. (1997) Infant Multinationals: Internationalisation of Small Technology-Based Firms. In: Jones-Evans, D. and Klofsten, M., (eds) *Technology, Innovation and Enterprise: The European Experience*. Hampshire: Macmillan, pp303-324.
- Lindqvist, M.C. (1990) Critical Success Factors in the Process of Internationalization of Small Hi-Tech Firms. In: Birley, S. (ed) *Building European Ventures*. Amsterdam: Elsevier, pp36-60.
- Litvak, I.A. (1990) Instant International: Strategic Reality for Small High-Technology Firms in Canada. *Multinational Business* 2(Summer), pp1-12.
- Low, M.B. and MacMillan, I.C. (1988) Entrepreneurship: Past Research and Future Challenges. *Journal of Management* 14, pp139-161.
- Luostarinen, R. (1980) Internationalization of the Firm. Helsinki: The Helsinki School of Economics.
- Luostarinen, R. (1994) Internationalization of Finnish Firms and their Response to Global Challenges. UNU World Institute for Development Economics Research.
- Madhok, A. (1997) Cost, Value and Foreign Market Entry Mode: The Transaction and the Firm. *Strategic Management Journal* 18, pp39-61.
- Madsen, T.K. (1987) Empirical Export Performance Studies: A Review of Conceptualizations and Findings. *Advances in International Marketing* 2, pp177-198.
- Madsen, T.K. and Servais, P. (1997) The Internationalization of Born Globals: An Evolutionary Process? *International Business Review* 6, pp561-583.
- Mahoney, J.T. and Pandian, J.R. (1992) The Resource-Based View Within the Conversation of Strategic Management. *Strategic Management Journal* 13, pp363-380.
- Mamis, R.A. (1989) Global Start-Up. *Inc.* (August), pp38-47.
- Mason, C.M. and Harrison, R. (1992) The Supply of Equity Finance in the UK: A Strategy for Closing the Equity Gap. *Entrepreneurship and Regional Development* 4, pp357-380.
- McDougall, P.P. (1989) International Versus Domestic Entrepreneurship: New Venture Strategic Behavior and Industry Structure. *Journal of Business Venturing* 4, pp387-400.

McDougall, P.P., Covin, J.G., Robinson, R.B. Jr. and Herron, L. (1994) The Effects of Industry Growth and Strategic Breadth on New Venture Performance and Strategy Content. *Strategic Management Journal* 15, pp537-554.

McDougall, P.P. and Oviatt, B.M. (1991) Global Start-ups: New Ventures Without Geographic Limits. *The Entrepreneurship Forum* (Winter), pp1-5.

McDougall, P.P. and Oviatt, B.M. (1996) New Venture Internationalization, Strategic Change, and Performance: A Follow-up Study. *Journal of Business Venturing* 11, pp23-40.

McDougall, P.P. and Oviatt, B.M. (1997) International Entrepreneurship Literature in the 1990s and Directions for Future Research. In: Sexton, D.L. and Smilor, R.W. (eds) *Entrepreneurship 2000*. Chicago: Upstart Publishing Co., pp291-320.

McDougall, P.P. and Oviatt, B.M. (2000) International Entrepreneurship: The Intersection of Two Research Paths. *Academy of Management Journal* 43(5), pp902-909.

McDougall, P.P. and Robinson, R.B. Jr. (1990) New Venture Strategies: An Empirical Identification of Eight 'Archetypes' of Competitive Strategies for Entry. *Strategic Management Journal* 11, pp447-467.

McDougall, P.P., Robinson, R.B. Jr. and DeNisi, A.S. (1992) Modeling New Venture Performance: An Analysis of New Venture Strategy, Industry Structure, and Venture Origin. *Journal of Business Venturing* 7, pp267-289.

McDougall, P.P., Shane, S. and Oviatt, B.M. (1994) Explaining the Formation of International New Ventures: The Limits of Theories from International Business Research. *Journal of Business Venturing* 9, pp469-487.

McKinsey & Co. (1993) Emerging Exporters: Australia's High Value Added Manufacturing Exporters. Melbourne: Australia Manufacturing Council.

McNally, K. (1995) Corporate Venture Capital: The Financing of Technology Businesses. *International Journal of Entrepreneurial Behaviour & Research* 1(3), pp9-43.

McNally, K.N. (1994) Sources of Finance for UK Venture Capital Funds: The Role of Corporate Investors. *Entrepreneurship and Regional Development* 6(4), pp275-297.

Miesenbock, K.J. (1988) Small Business and Exporting: A Literature Review. *International Small Business Journal* 6(2), pp42-61.

Miles, M.B. and Huberman, A.M. (1994) Qualitative Data Analysis - An Expanded Sourcebook. 2nd Edition. Newbury Park: Sage.

Miller, A. and Camp, B. (1985) Exploring Determinants of Success in Corporate Ventures. *Journal of Business Venturing* 1, pp87-105.

- Moore, B. (1994) Financial Constraints to the Growth and Development of Small High-Technology Firms. In: Hughes, A. and Storey, D.J. (eds) *Finance and the Small Firm*. London: Routledge, pp112-144.
- Morrison, A.J. (1990) Strategies in Global Industries: How U.S. Businesses Compete. Westport, Connecticut: Quorum Books.
- Morrison, A.J. and Roth, K. (1992) A Taxonomy of Business-Level Strategies in Global Industries. *Strategic Management Journal* 13, pp399-418.
- Murray, G.C. and Lott, J. (1995) Have UK Venture Capitalists a Bias Against Investment in New Technology-based Firms? *Research Policy* 24, pp283-299.
- Oakey, R. (1991) Government Policy Toward High Technology. In: Curran, J. and Blackburn, R.A. (eds) *Paths of Enterprise: The Future of the Small Business*. London: Routledge, pp128-148.
- Oakey, R.P. (1984) Innovation and Regional Growth in Small High Technology Firms: Evidence from Britain and the USA. *Regional Studies* 18(3), pp237-251.
- Oakey, R.P., Faulkner, W., Cooper, S.Y. and Walsh, V. (1990) New Firms in the Biotechnology Industry: Their Contribution to Innovation and Growth. London: Pinter Publishers.
- Oakley, P. (1996) High-Tech NPD Success through Faster Overseas Launch. *European Journal of Marketing* 30(8), pp75-91.
- OECD (1997) Globalisation and Small and Medium Enterprises (SMEs). Paris: OECD.
- OECD (2000) Measuring the ICT Sector.
- Oesterle, M.-J. (1997) Time-Span until Internationalization: Foreign Market Entry as a Built-in-Mechanism of Innovations. *Management International Review* 2(Special Issue), pp125-149.
- Ohmae, K. (1990) The Borderless World: Power and Strategy in the Interlinked Economy. New York: Harper Business.
- Ohmae, K. (1995) The End of the Nation State, The Rise of Regional Economies. New York: The Free Press.
- Ostgaard, T.A. and Birley, S. (1996) New Venture Growth and Personal Networks. *Journal of Business Research* 36, pp37-50.
- Oviatt, B.M. and McDougall, P.P. (1994) Toward a Theory of International New Ventures. *Journal of International Business Studies* 25(1), pp45-64.
- Oviatt, B.M. and McDougall, P.P. (1995) Global Start-ups: Entrepreneurs on a Worldwide Stage. *Academy of Management Executive* 9(2), pp30-43.

- Oviatt, B.M. and McDougall, P.P. (1997) Challenges for Internationalization Process Theory: The Case of International New Ventures. *Management International Review* 37(Special Issue), pp85-99.
- Oviatt, B.M., McDougall, P.P., Simon, M. and Schrader, R.C. (1993) Heartware International Corporation: A Medical Equipment Company "Born International" Part A. *Entrepreneurship: Theory & Practice* 18, pp111-128.
- Oviatt, B.M., McDougall, P.P., Simon, M. and Shrader, R.C. (1991) A New Venture Without Geographic Limits: Case History of a Global Start-up. In: Churchill, N.C. et al. (eds) *Frontiers of Entrepreneurship Research*. Babson Park, MA: Babson College, pp64-78.
- Penrose, E. (1959) *The Theory of the Growth of the Firm*. London: John Wiley.
- Perlmutter, H.V. (1969) The Tortuous Evolution of the Multinational Corporation. *Columbia Journal of World Business* (January-February), pp9-18.
- Perlmutter, H.V. (1984) Building the Symbiotic Societal Enterprise: A Social Architecture for the Future. *World Futures* 19, pp271-284.
- Perlmutter, H.V. and Heenan, D.A. (1986) Cooperate to Compete Globally. *Harvard Business Review*, pp136-152.
- Peteraf, M.A. (1993) The Cornerstones of Competitive Advantage: A Resource-Based View. *Strategic Management Journal* 14, pp179-188.
- Petersen, B. and Pedersen, T. (1997) Twenty Years After - Support and Critique of the Uppsala Internationalisation Model. In: Bjorkman, I. and Forsgren, M. (eds) *The Nature of the International Firm*. Copenhagen: Business School Press, pp117-134.
- Porter, M.E. (1980) *Competitive Strategy: Techniques for Analyzing Industries and Competitors*. New York: The Free Press.
- Porter, M.E. (1984) Competition in Global Industries: A Conceptual Framework. Paper presented to the Colloquium on Competition in Global Industries, Harvard Business School.
- Porter, M.E. (1985) *Competitive Advantage*. New York: The Free Press.
- Porter, M.E. (1986) Changing Patterns of International Competition. *California Management Review* 28, pp9-40.
- Porter, M.E. (1986) Competition in Global Industries: A Conceptual Framework. In: Porter, M.E. (ed) *Competition in Global Industries*. Boston, MA: Harvard Business School Press, pp15-60.
- Rasmussen, E.S., Madsen, T.K. and Evangelista, F. (2001) The Founding of the Born Global Company in Denmark and Australia: Sensemaking and Networking. *Asia Pacific Journal of Marketing and Logistics* 13(3), pp75-107.

- Reid, S.D. (1981) The Decision-Maker and Export Entry and Expansion. *Journal of International Business Studies* 12(Fall), pp101-112.
- Reid, S.D. (1982) The Impact of Size on Export Behaviour in Small Firms. In: Czinkota, M.R. and Tesar, G. (eds) *Export Management: An International Context*. New York: Praeger, pp18-38.
- Rennie, M.W. (1993) Born Global. *McKinsey Quarterly* 4, pp45-52.
- Reuber, A.R. and Fischer, E. (1997) The Influence of the Management Team's International Experience on the Internationalization Behaviors of SMEs. *Journal of International Business Studies* 28(4), pp807-825.
- Reynolds, N., Diamantopoulos, A. and Schlegelmilch, B. (1993) Pretesting in Questionnaire Design: A Review of the Literature and Suggestions for Further Research. *Journal of the Market Research Society* 35(2), pp171-182.
- Reynolds, P.D., Hay, M. and Camp, S.M. (1999) Global Entrepreneurship Monitor. Executive Report. Kauffman Center for Entrepreneurial Leadership.
- Rizzoni, A. (1991) Technological Innovation and Small Firms: A Taxonomy. *International Small Business Journal* 9(3), pp31-42.
- Roberts, E.B. (1991) *Entrepreneurs in High Technology: Lessons from MIT and Beyond*. New York: Oxford University Press.
- Roberts, E.B. and Senturia, T.A. (1996) Globalizing the Emerging High-Technology Company. *Industrial Marketing Management* 25, pp491-506.
- Robinson, R.D., Dickson, J.P. and Knutsen, J.A. (1997) From Multinational to Transnational? *The International Executive* 39, pp35-54.
- Robinson, J.P., Shaver, P.R. and Wrightsman, L.S. (1991) Criteria for Scale Selection and Evaluation. In: Robinson, J.P., Shaver, P.R. and Wrightsman, L.S. (eds) *Measures of Personality and Social Psychology Attitudes*. San Diego, CA: Academic Press.
- Romanelli, E. (1989) Environments and Strategies of Organization Start-up: Effects on Early Survival. *Administrative Science Quarterly* 34, pp369-387.
- Root, F.R. (1994) *Entry Strategies for International Markets*. San Francisco, CA: Jossey-Bass Inc.
- Rugman, A.M. (1979) *International Diversification and the Multinational Enterprise*. Lexington, MA: D.C. Heath and Company.
- Rugman, A.M. (1980) Internalization as a General Theory of Foreign Direct Investment: A Reappraisal of the Literature. *Weltwirtschaftliches Archiv* 116, pp365-379.

Rugman, A.M. (1981) *Inside the Multinational: The Economics of Internal Markets*. London: Croom Helm.

Rugman, A.M. (1986) New Theories of the Multinational Enterprise: An Assessment of Internalization Theory. *Bulletin of Economic Research* 38(2), pp101-118.

Rumelt, R.P. (1984) Towards a Strategic Theory of the Firm. In: Lamb, R.B. (ed) *Competitive Strategic Management*. Englewood Cliffs, N.J.: Prentice-Hall, pp566-570.

Sanchez, R., Heene, A. and Thomas, H. (1996) *Dynamics of Competence-Based Competition*. Oxford: Pergamon.

Sandberg, W.R. and Hofer, C.W. (1987) Improving New Venture Performance: The Role of Strategy, Industry Structure, and the Entrepreneur. *Journal of Business Venturing* 2, pp5-28.

Schumpeter, J.A. (1949) Economic Theory and Entrepreneurial History. In: *Change and the Entrepreneur*. Cambridge, MA: Harvard University Press.

Shan, W. (1990) An Empirical Analysis of Organizational Strategies by Entrepreneurial High-Technology Firms. *Strategic Management Journal* 11, pp129-139.

Shanks, D.C. (1985) Strategic Planning for Global Competition. *Journal of Business Strategy*, pp20-26.

Sharma, D.D. and Johanson, J. (1987) Technical Consultancy in Internationalisation. *International Marketing Review* (Winter), pp20-29.

Shrader, R.C., Oviatt, B.M. and McDougall, P.P. (1996) A Risk-Taking Perspective on the Internationalization of New Ventures. Entrepreneurship Division, Academy of Management Meeting, 1996.

Simonin, B.L. (1999) Transfer of Marketing Know-how in International Strategic Alliances. *Journal of International Business Studies* 30(3), pp463-490.

Stanworth, M.J.K. and Curran, J. (1976) Growth and the Small Firm - An Alternative View. *Journal of Management Studies* 13(2), pp95-110.

Starr, J.A. and MacMillan, I.C. (1990) Resource Cooptation Via Social Contracting: Resource Acquisition Strategies for New Ventures. *Strategic Management Journal* 11, pp79-92.

Stearns, T.M. (1996) Strategic Alliances and Performance of High Technology New Firms. In: *Frontiers of Entrepreneurship Research*. Babson Park, MA: Babson College.

- Stevenson, H.H. and Jarillo, J.C. (1990) A Paradigm of Entrepreneurship: Entrepreneurial Management. *Strategic Management Journal* 11, pp17-27.
- Storey, D.J. and Johnson, S. (1986) Job Generation in Britain: A Review of Recent Studies. *International Small Business Journal* 4, pp29-46.
- Strauss, A. and Corbin, J. (1990) Basics of Qualitative Research: Grounded Theory Procedures and Techniques. Newbury Park: Sage.
- Stuart, R. and Abetti, P.A. (1987) Start-up Ventures: Towards the Prediction of Initial Success. *Journal of Business Venturing* 2, pp215-230.
- Styles, C. and Ambler, T. (1994) Successful Export Practice: The UK Experience. *International Marketing Review* 11(6), pp23-47.
- Sullivan, D. and Bauerschmidt, A. (1990) Incremental Internationalization: A Test of Johanson and Vahlne's Thesis. *Management International Review* 30(1), pp19-30.
- Sweeting, R.C. (1991) Early-Stage New Technology-based Businesses: Interactions with Venture Capitalists and the Development of Accounting Techniques and Procedures. *British Accounting Review* 23, pp3-21.
- Teece, D.J., Pisano, G. and Shuen, A. (1997) Dynamic Capabilities and Strategic Management. *Strategic Management Journal* 18(7), pp509-533.
- The Economist (1993) America's Little Fellows Surge Ahead. 328(July 3), pp59-60.
- Thomas, A.S. and Mueller, S.L. (2000) A Case for Comparative Entrepreneurship: Assessing the Relevance of Culture. *Journal of International Business Studies* 31(2), pp287-300.
- Tull, D.S. and Hawkins, D.I. (1993) Marketing Research: Measurement and Method, 6th Edition. New York: Macmillan.
- Turnbull, P.W. (1987) A Challenge to the Stages Theory of the Internationalization Process. In: Rosson, P.J. and Reed, S.D. (eds) *Managing Export Entry and Expansion*. New York: Praeger Publishers, pp21-40.
- Tyebjee, T.T. (1990) The Internationalization of High Tech Ventures. In: Churchill, N.C. et al. (eds) *Frontiers of Entrepreneurship Research*. Babson Park, MA: Babson College, pp452-467.
- UNCTAD (1993) World Investment Report: Transnational Corporations and Integrated International Production. New York: United Nations Publications.
- US Small Business Administration (1988) Annual Report. Washington, D.C.: US Government Printing Office.

- US SBA (1993) The Wide World of International Trade. *Small Business Success* 6, pp30-42.
- Van Maanen, J. (1983) *Qualitative Methodology*. London: Sage.
- Vanderwerf, P.A. (1991) Tests of Performance Correlates in the High-Speed Circuit Industry. In: Churchill, N.C. et al. (eds) *Frontiers of Entrepreneurship Research*. Babson Park, MA: Babson College, pp638-651.
- Vernon, R. (1966) International Investment and International Trade in the Product Cycle. *Quarterly Journal of Economics* 80, pp190-207.
- Vernon, R. (1979) The Product Cycle Hypothesis in a New International Environment. *Oxford Bulletin of Economics and Statistics* 41(4), pp255-267.
- Welch, L.S. (1992) The Use of Alliances by Small Firms in Achieving Internationalization. *Scandinavian International Business Review* 1, pp21-37.
- Welch, L.S. and Luostarinen, R. (1988) Internationalization: Evolution of a Concept. *Journal of General Management* 14(2), pp155-171.
- Welch, L.S. and Luostarinen, R.K. (1993) Inward-Outward Connections in Internationalization. *Journal of International Marketing* 1(1), pp46-58.
- Wernerfelt, B. (1984) A Resource-Based View of the Firm. *Strategic Management Journal* 5, pp171-180.
- Wheeler, C., Jones, M. and Young, S. (1996) Market Entry Modes and Channels of Distribution in the UK Machine Tool Industry. *European Journal of Marketing* 30(4), pp40-58.
- Williamson, O.E. (1975) *Markets and Hierarchies: Analysis and Antitrust Implications*. New York: Free Press.
- Williamson, O.E. (1981) The Economics of Organization: The Transaction Cost Approach. *American Journal of Sociology* 87(3), pp548-577.
- Williamson, O.E. (1983) Credible Commitments: Using Hostages to Support Exchange. *American Economic Review* 73, pp519-540.
- Williamson, O.E. (1985) *The Economic Institutions of Capitalism*. New York: Macmillan.
- World Bank (2001) *World Bank Country Data Profiles*.
- Yin, R. (1994) *Case Study Research: Designs and Methods*. Thousand Oaks, CA: Sage Publishing.
- Yip, G.S. and Coundouriotis, G.A. (1991) Diagnosing Global Strategy Potential: The World Chocolate Confectionery Industry. *Planning Review* pp4-14.

Yip, G.S. (1992) *Total Global Strategy: Managing for Worldwide Competitive Advantage*. Englewood Cliffs, NJ: Prentice-Hall.

Young, S. (1990) Internationalisation: Introduction and Overview. *International Marketing Review* 7(4), pp5-10.

Young, S., Bell, J. and Crick, D. (1998) *The Resource-Based Perspective and Small Firm Internationalisation: An Exploratory Approach*. Strathclyde International Business Unit Working Paper 1998/3.

Young, S., Hamill, J., Wheeler, C. and Davies, J.R. (1989) *International Market Entry and Development*. Hemel Hempstead: Harvester Wheatsheaf.

Zahra, S.A., Ireland, R.D. and Hitt, M.A. (2000) International Expansion by New Venture Firms: International Diversity, Mode of Market Entry, Technological Learning, and Performance. *Academy of Management Journal* 43(5), pp925-950.

APPENDIX A

INTERVIEW TEMPLATE

Firm Data

Date:

Company:

Company Address / Telephone:

Interviewee / Current Position:

Industry / Sector:

Product (s):

Approximate 1998 total sales:

Approximate % international:

Current number of employees:

Historical overview available?

Phase 1

1. Year firm founded:

2. Independent start-up rather than corporate sponsored venture? % equity
held by another firm? Which firm?

3. Year started with firm:

4. Position at founding / early years:

5. Original founder(s):

6. Knowledge of founding and early firm organisational characteristics and strategy?

7. Initial firm industry / sector:
8. Initial firm product (s):
9. Approximate number of employees at time of initial international activity:
10. Did the founder(s) have international objectives for the firm at or near inception (i.e. an international vision)?
11. Which countries did the firm sell its products in during the first five years of the firm's existence and what entry modes were employed (e.g. export, licensing, investment)?
12. How and why were these country-markets selected?
13. Approximate % of international sales to total firm sales during the first five years of the firm's existence?

14. What organisational activities (e.g. foreign sales subsidiaries, production, R&D) were located in foreign countries in the first five years of the firm's existence? Which countries? Direct investment or alliance / network relationship?

15. Why did the firm choose to locate these organisational activities in foreign countries early in the firm's existence?

16. How were the locations of these foreign organisational activities selected?

17. Are these foreign organisational activities part of a co-ordinated firm-wide strategy, benefiting the entire organisation and with shared learning experiences?

18. How and why are these foreign organisational activities co-ordinated?

19. What factors led to the new venture being international very early in its existence? Why the international focus rather than domestic?

20. Was the firm's early internationalisation a success, both strategically and economically? Based on what company criteria or measures?

21. What characteristics and activities of the founder(s) led to the success of the firm's early internationalisation?

22. What organisational characteristics and structural attributes led to the success of the firm's early internationalisation?

23. What product and marketing strategic elements led to the success of the firm's early internationalisation?

24. What additional founder, organisational and strategic factors could have enhanced the success of the firm if they had been implemented?

Phase 2

Please indicate the level of *importance* of each of the following factors to the firm's *decision to be international* at or near inception, utilising a 5-point scale with 1 being 'none' and 5 being 'substantial':

<u>Factors</u>	<u>None</u>		<u>Substantial</u>			
	1	2	3	4	5	N/A
International vision of the founder(s)						N/A
Founders' international experience	1	2	3	4	5	N/A
Envisionment of a specific international opportunity	1	2	3	4	5	N/A
Desire to exploit a proprietary technology or process globally	1	2	3	4	5	N/A
Provide additional market opportunities	1	2	3	4	5	N/A
To achieve economies of scale	1	2	3	4	5	N/A
Short product life cycles, necessitating international sales	1	2	3	4	5	N/A
To recoup the high costs of R&D and be economically viable	1	2	3	4	5	N/A
Small domestic market	1	2	3	4	5	N/A
To avoid intense or direct domestic competition	1	2	3	4	5	N/A
International and competitive nature of the firm's industry	1	2	3	4	5	N/A
Ability to respond to competitor initiatives world-wide	1	2	3	4	5	N/A
To pre-empt competitors	1	2	3	4	5	N/A
To minimise complications of later shifting to international markets following a period of exclusive domestic focus	1	2	3	4	5	N/A
Pressure exerted by the firm's customers	1	2	3	4	5	N/A
Influence of the firm's network partners	1	2	3	4	5	N/A
Need to obtain foreign financing	1	2	3	4	5	N/A
Increased homogeneity of international markets	1	2	3	4	5	N/A
Advances in global communications, information technology and transportation, facilitating international operations	1	2	3	4	5	N/A

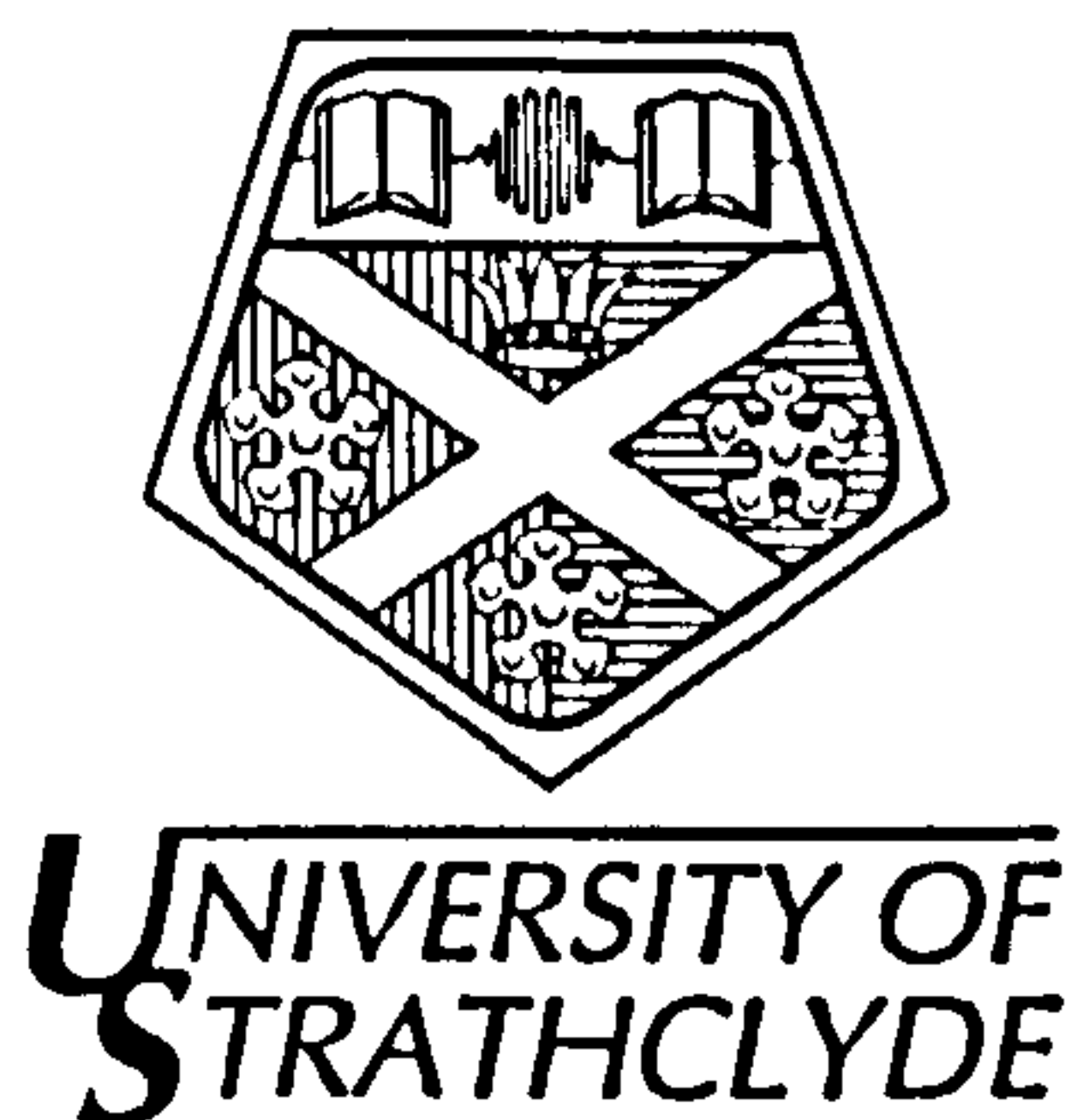
Please indicate the level of *importance* of each of the following factors to the firm's *early internationalisation success*, utilising a 5-point scale with 1 being 'none' and 5 being 'substantial':

<u>Factors</u>	<u>None</u>					<u>Substantial</u>
Founder:						
International vision	1	2	3	4	5	N/A
Reputation of founder	1	2	3	4	5	N/A
Industry experience	1	2	3	4	5	N/A
Previous start-up experience	1	2	3	4	5	N/A
Extensive planning process	1	2	3	4	5	N/A
Extensive market research	1	2	3	4	5	N/A
Obtaining professional advice (e.g. legal and accounting)	1	2	3	4	5	N/A
Strong international business and social networks	1	2	3	4	5	N/A
Sufficient working capital	1	2	3	4	5	N/A
Focus on sufficient income generation and cash flow	1	2	3	4	5	N/A
International resource commitment	1	2	3	4	5	N/A
Organisational:						
Highest quality personnel	1	2	3	4	5	N/A
Internationally experienced managers	1	2	3	4	5	N/A
Unique intangible asset, such as unique knowledge	1	2	3	4	5	N/A
Sophisticated communications network	1	2	3	4	5	N/A
Engaging in strategic alliances and joint ventures	1	2	3	4	5	N/A
Utilisation of business and social network relationships	1	2	3	4	5	N/A
Minimal and selective international investments	1	2	3	4	5	N/A
Tightly networked global organisation	1	2	3	4	5	N/A

Flexibility and swift response capabilities	1	2	3	4	5	N/A
Distribution channel support	1	2	3	4	5	N/A
Product and Marketing Strategy:						
Differentiated products	1	2	3	4	5	N/A
Premium pricing	1	2	3	4	5	N/A
Narrowly focused product line	1	2	3	4	5	N/A
Products in growth industry	1	2	3	4	5	N/A
Unique, innovative products	1	2	3	4	5	N/A
High quality products	1	2	3	4	5	N/A
Products that ride on an industry change or shift	1	2	3	4	5	N/A
Operating in international niche markets	1	2	3	4	5	N/A
Pre-emptive technology or marketing (i.e. being a first mover)	1	2	3	4	5	N/A
Standardised products with minimal foreign adaptation	1	2	3	4	5	N/A
Targeting homogenous world-wide segments	1	2	3	4	5	N/A
Lead market success	1	2	3	4	5	N/A
Aggressive entry into broad markets	1	2	3	4	5	N/A
Continuous innovation	1	2	3	4	5	N/A
Follow-on products from same technology	1	2	3	4	5	N/A
Linked product and service extensions (e.g. selling supplies or offering consulting services)	1	2	3	4	5	N/A
Expanding breadth of competence	1	2	3	4	5	N/A

APPENDIX B

UK MAIL SURVEY



KEY SUCCESS FACTORS FOR EARLY-INTERNATIONALISING HIGH TECHNOLOGY FIRMS

GENERAL INSTRUCTIONS

1. It is very important that an individual with direct knowledge of the founding conditions and characteristics of your company fill out this questionnaire. Therefore, if possible, please ensure that a founder, member of the founding team or an executive with early company knowledge completes the survey.
2. Please try to answer all the questions. If none of the response choices exactly fits your company's situation, please select the choice that *best* approximates your ideal response.
3. Please be assured that your responses will be kept strictly confidential. The report of findings will not include the names of individuals or companies and all data will be reported in aggregate form.
4. If you would like to receive a copy of the executive summary of findings, please enclose a business card (including your e-mail address) with the completed questionnaire. Thank you very much for your valuable contribution to this research study.

1. What is your position in the company? _____
2. Are you a founder or member of the founding team? Yes No
3. Do you have direct knowledge of the founding conditions and early characteristics of your company? Yes No
4. In what year was your company founded? 19_____
5. Which of the following classifications describe your company's founding? (Please tick all that apply)
 - Independent start-up (i.e. not sponsored by another company)
 - Spin-off from another company
 - Spin-off from a university
 - Other (please specify) _____
6. Which of the following industry sectors provides the *best* categorisation for your company?
 - Computer software
 - Computer hardware
 - Electronics
 - Other (please specify) _____
7. What percentage of your company's most recent financial year turnover was attributable to the following business functions?
 - _____ % Product sales
 - _____ % Professional services
 - _____ % Other (please specify) _____
8. In what year did your company market its first commercial product? 19_____

9. Approximately what percentage of your company's employees (full-time equivalent) was engaged in research and development (R&D) activities for the most recent financial year? _____%
10. Approximately what percentage of your company's most recent financial year turnover was spent on R&D activities? _____%
11. In what year did your company achieve its first international sale? 19_____
12. Approximately how many employees did your company have at the time of its first international sale? _____
13. How many employees did your company have at the end of its most recent financial year? _____
14. Did the company founder(s) have an international vision (i.e. international outlook and aspirations) for the company *at or within one year of inception*?
- Yes No
15. a) In how many countries did your company sell its products and/or services during the first five years of its international activity? _____
- b) Spanning how many continents? _____
- c) Please list the first 5 countries below in the order of market entry:
- 1) _____
- 2) _____
- 3) _____
- 4) _____
- 5) _____

16. Approximately what *average* annual percentage of your company's turnover over the first five years of its international activity was directly attributable to international sales? _____%

17. Please indicate the *level of importance* of each of the following factors to the *selection of your company's first five foreign markets*, using the provided scale ranging from 'low' to 'high':

<u>Factors</u>	Level of Importance				
	<u>Low</u>				<u>High</u>
Large foreign markets	1	2	3	4	5
Key and important industry markets	1	2	3	4	5
Following domestic customers into foreign markets	1	2	3	4	5
Unsolicited foreign orders or enquiries	1	2	3	4	5
International contacts and sales leads	1	2	3	4	5
Influence of network and alliance partners	1	2	3	4	5
Geographic closeness	1	2	3	4	5
English-speaking nations	1	2	3	4	5
Cultural similarities	1	2	3	4	5
Other (please specify) _____	1	2	3	4	5

18. Which of the following foreign market entry methods were utilised and when were they first implemented? (Please tick and provide dates for all that apply)

<u>Entry Method</u>	<u>Year</u>
<input type="checkbox"/> Exporting utilising agents or distributors	19_____
<input type="checkbox"/> Exporting directly utilising company personnel	19_____
<input type="checkbox"/> Licensing	19_____
<input type="checkbox"/> Establishing wholly owned subsidiaries	19_____
<input type="checkbox"/> Engaging in equity joint ventures	19_____
<input type="checkbox"/> Engaging in strategic alliances (i.e. business partnerships)	19_____
<input type="checkbox"/> Other (please specify) _____	19_____

19. Which (if any) of the following organisational activities did your company establish in foreign countries during its first five years of international activity? (Please tick all that apply and provide country locations)

Activities

Countries

- Sales & marketing offices
- Service and after-sale-support offices
- Production facilities
- R&D units
- Other (please specify) _____
- None during the first five years *

*** If you answered 'None' please proceed to Question 22**

20. If more than one foreign organisational activity or country was noted in Question 19, please indicate the *extent to which you agree* with the following statements regarding *your company's foreign organisational activity units* (i.e. offices and facilities), using the provided scale ranging from 'strongly disagree' to 'strongly agree':

	<u>Strongly Disagree</u>	<u>Disagree</u>	<u>Neutral</u>	<u>Agree</u>	<u>Strongly Agree</u>
Activities of each unit represent part of a co-ordinated company strategy	1	2	3	4	5
Activities of each unit benefit the entire organisation	1	2	3	4	5
Communication and information-exchange flow freely between the units	1	2	3	4	5
Learning experiences are openly shared between the units	1	2	3	4	5

21. Please indicate the *level of importance* of each of the following objectives to your *company's decision to locate organisational activities in foreign countries* in its first five years of international activity, utilising the provided scale ranging from 'low' to 'high':

<u>Objectives</u>	Level of Importance				
	<u>Low</u>				<u>High</u>
To establish a 'physical' presence in a key foreign market	1	2	3	4	5
To create the perception of a 'local' company rather than a foreign company	1	2	3	4	5
To better compete with a major competitor in its 'home-ground'	1	2	3	4	5
To meet the necessity of physically locating near an important customer's foreign site	1	2	3	4	5
To provide better regional sales and service support	1	2	3	4	5
To benefit from lower operational costs	1	2	3	4	5
To obtain high quality personnel	1	2	3	4	5
To comply with an obligation to have a physical presence in the location of a foreign funding source	1	2	3	4	5
To overcome tariff and other trade barriers	1	2	3	4	5
Other (please specify) _____ _____	1	2	3	4	5

22. Please indicate the *level of importance* of each of the following factors leading to your company's *initial involvement in international activity*, using the provided scale ranging from 'low' to 'high':

<u>Factors</u>	Level of Importance						
	<u>Low</u>						<u>High</u>
International vision of the founder(s)	1	2	3	4	5	6	7
Founders' international experience	1	2	3	4	5	6	7
Advice and assistance from governmental agencies	1	2	3	4	5	6	7
Desire to create an international mindset in the company from the beginning	1	2	3	4	5	6	7
Identification of a specific international opportunity	1	2	3	4	5	6	7
Desire to capitalise on a proprietary technology internationally	1	2	3	4	5	6	7
Desire to be an international market leader	1	2	3	4	5	6	7
Large proportion of prospective customers were foreign	1	2	3	4	5	6	7
Personal knowledge of international customers	1	2	3	4	5	6	7
International contacts and sales leads	1	2	3	4	5	6	7
OEM customers sold company's products internationally	1	2	3	4	5	6	7
Opportunity to supplement domestic sales	1	2	3	4	5	6	7
International sales were required to achieve economies of scale	1	2	3	4	5	6	7
Short product life cycles necessitated international sales	1	2	3	4	5	6	7
High R&D costs necessitated international sales	1	2	3	4	5	6	7
Small domestic market	1	2	3	4	5	6	7
Avoidance of intense or direct domestic competition	1	2	3	4	5	6	7
International and competitive nature of the company's industry	1	2	3	4	5	6	7
Need for ability to respond to competitor initiatives world-wide	1	2	3	4	5	6	7
Need for ability to pre-empt competitors	1	2	3	4	5	6	7
Pressure exerted by the company's customers	1	2	3	4	5	6	7
Influence of the company's business partners	1	2	3	4	5	6	7
Need to obtain foreign financing	1	2	3	4	5	6	7
Increased homogeneity of international markets	1	2	3	4	5	6	7
Advances in global communications, information technology and transportation reduced international business barriers	1	2	3	4	5	6	7

23. Please indicate the *extent* to which each of the following characteristics *existed* in your company during the *first five years of its initial international activity*, using the provided scale ranging from ‘not existent’ to ‘strongly existent’:

<u>Characteristics</u>	Existence of Characteristic						
	<u>Not Existent</u>			<u>Strongly Existent</u>			
<u>Founder(s):</u>							
International vision of founder(s)	1	2	3	4	5	6	7
Founders’ open-mindedness regarding international opportunities	1	2	3	4	5	6	7
Previous business and/or academic distinction of founder(s)	1	2	3	4	5	6	7
International experience of founder(s)	1	2	3	4	5	6	7
Industry experience of founder(s)	1	2	3	4	5	6	7
Previous start-up experience of founder(s)	1	2	3	4	5	6	7
Founders’ mix of technical and business skills	1	2	3	4	5	6	7
Founders’ determination and tenacity	1	2	3	4	5	6	7
Commitment to be an industry leader	1	2	3	4	5	6	7
Willingness to commit resources to international operations	1	2	3	4	5	6	7
Strong international business and social networks	1	2	3	4	5	6	7
Extensive planning process	1	2	3	4	5	6	7
Extensive market research	1	2	3	4	5	6	7
Obtainment of professional advice (e.g. legal and accounting)	1	2	3	4	5	6	7
Procurement of sufficient working capital	1	2	3	4	5	6	7
Focus on income generation and cash flow	1	2	3	4	5	6	7
Support for sales function	1	2	3	4	5	6	7

<u>Characteristics</u>	Existence of Characteristic						
	<u>Not Existent</u>						<u>Strongly Existent</u>
<u>Organisation:</u>							
High quality personnel	1	2	3	4	5	6	7
Internationally experienced managers	1	2	3	4	5	6	7
Flat organisational structure rather than hierarchical	1	2	3	4	5	6	7
Business as well as technical orientation amongst staff	1	2	3	4	5	6	7
Strong accounting and legal functions	1	2	3	4	5	6	7
Ambitious, goal-driven internal behaviour	1	2	3	4	5	6	7
Entrepreneurial spirit amongst staff	1	2	3	4	5	6	7
Customer focus throughout organisation	1	2	3	4	5	6	7
Possession of a unique intangible asset (e.g. unique knowledge)	1	2	3	4	5	6	7
Engaging in strategic alliances and joint ventures	1	2	3	4	5	6	7
Utilisation of business and social network relationships	1	2	3	4	5	6	7
Minimum and selective international investments (i.e. conservation of resources)	1	2	3	4	5	6	7
Tightly networked global organisation	1	2	3	4	5	6	7
Advanced internal communications network	1	2	3	4	5	6	7
Flexibility and swift response capabilities	1	2	3	4	5	6	7
Distribution channel support	1	2	3	4	5	6	7

<u>Characteristics</u>	Existence of Characteristic						
	<u>Not Existent</u>						<u>Strongly Existent</u>
<u>Product and Marketing Strategy:</u>							
Differentiated products	1	2	3	4	5	6	7
Unique, innovative products	1	2	3	4	5	6	7
High quality products	1	2	3	4	5	6	7
Customer-driven product design	1	2	3	4	5	6	7
Narrowly focused product line	1	2	3	4	5	6	7
Standardised products requiring minimal foreign adaptation	1	2	3	4	5	6	7
Products in a growth industry	1	2	3	4	5	6	7
Products that follow industry changes or shifts	1	2	3	4	5	6	7
Premium pricing	1	2	3	4	5	6	7
Providing customer-favourable sales or royalty collection terms	1	2	3	4	5	6	7
Linked product and service extensions (e.g. selling supplies or offering consulting services)	1	2	3	4	5	6	7
Clear company marketing strategy	1	2	3	4	5	6	7
Operating in international niche markets	1	2	3	4	5	6	7
Targeting similar groups of customers world-wide	1	2	3	4	5	6	7
Pre-emptive technology or marketing (i.e. being a first mover)	1	2	3	4	5	6	7
Aggressive entry into foreign markets	1	2	3	4	5	6	7
Targeting key or leading industry markets	1	2	3	4	5	6	7
Being perceived as a 'local' company in foreign markets	1	2	3	4	5	6	7
Participation in international trade shows	1	2	3	4	5	6	7
Product introduction and give-aways to academics and universities	1	2	3	4	5	6	7
Continuous innovation	1	2	3	4	5	6	7
Follow-on products from same technology	1	2	3	4	5	6	7
Expanding breadth of competence	1	2	3	4	5	6	7
Capitalising on the company's learning experiences	1	2	3	4	5	6	7

24. What was your company's approximate total annual turnover for the most recent financial year?

- | | | |
|--|---|--|
| <input type="checkbox"/> Less than £500,000 | <input type="checkbox"/> £5m to less than £10m | <input type="checkbox"/> £30m to less than £50m |
| <input type="checkbox"/> £500,000 to less than £1.5m | <input type="checkbox"/> £10m to less than £20m | <input type="checkbox"/> £50m to less than £100m |
| <input type="checkbox"/> £1.5m to less than £5m | <input type="checkbox"/> £20m to less than £30m | <input type="checkbox"/> Over £100m |

25. Please rate your company's *international sales growth* during its *first five years of international activity* relative to its objectives, using the provided scale ranging from 'unsuccessful' to 'successful':

<u>Unsuccessful</u>								<u>Successful</u>
1	2	3	4	5	6	7		

26. Please rate your company's *international profit growth* during its *first five years of international activity* relative to its objectives, using the provided scale ranging from 'unsuccessful' to 'successful':

<u>Unsuccessful</u>								<u>Successful</u>
1	2	3	4	5	6	7		

27. Please indicate the *extent* to which your company *achieved all of its initial international strategic objectives* (e.g. establish presence in key international markets, create international awareness of product/company, attain a specific level of international market share, etc.) *during its first five years of international activity* using the provided scale ranging from 'not achieved' to 'fully achieved':

<u>Not Achieved</u>								<u>Fully Achieved</u>
1	2	3	4	5	6	7		

28. Please estimate your company's *average annual growth rate* of international sales for its first five years of international activity (recognising the likelihood of an irregular growth pattern): _____%

29. Please rate the *average annual profitability* of your company's first five years of international activity using the provided scale ranging from 'highly unprofitable' to 'highly profitable':

Highly <u>Unprofitable</u>	Moderately <u>Unprofitable</u>	Marginally <u>Unprofitable</u>	<u>Breakeven</u>	Marginally <u>Profitable</u>	Moderately <u>Profitable</u>	Highly <u>Profitable</u>
1	2	3	4	5	6	7

Thank you very much for participating in this survey!

Please enclose a business card (including e-mail address) with the completed questionnaire if you would like to receive an executive summary of the findings.

Please return the completed questionnaire in the enclosed pre-paid envelope to:

Jeffrey Johnson
University of Strathclyde
Department of Marketing
Stenhouse Building
173 Cathedral Street
Glasgow, G4 0RQ

US MAIL SURVEY



KEY SUCCESS FACTORS FOR EARLY-INTERNATIONALIZING HIGH TECHNOLOGY FIRMS

GENERAL INSTRUCTIONS

1. It is very important that an individual with direct knowledge of the founding conditions and characteristics of your company fill out this questionnaire. Therefore, if possible, please ensure that a founder, member of the founding team or an executive with early company knowledge completes the survey.
2. Please try to answer all the questions. If none of the response choices exactly fits your company's situation, please select the choice that *best* approximates your ideal response.
3. Please be assured that your responses will be kept strictly confidential. The report of findings will not include the names of individuals or companies and all data will be reported in aggregate form.
4. If you would like to receive a copy of the executive summary of findings, please enclose a business card (including your e-mail address) with the completed questionnaire. Thank you very much for your valuable contribution to this research study.

1. What is your position in the company? _____
2. Are you a founder or member of the founding team? Yes No
3. Do you have direct knowledge of the founding conditions and early characteristics of your company? Yes No
4. In what year was your company founded? 19_____
5. Which of the following classifications describe your company's founding? (Please tick all that apply)
 - Independent start-up (i.e. not sponsored by another company)
 - Spin-off from another company
 - Spin-off from a university
 - Other (please specify) _____
6. Which of the following industry sectors provides the *best* categorization for your company?
 - Computer software
 - Computer hardware
 - Electronics
 - Other (please specify) _____
7. What percentage of your company's most recent financial year revenue was attributable to the following business functions?
 - _____ % Product sales
 - _____ % Professional services
 - _____ % Other (please specify) _____
8. In what year did your company market its first commercial product? 19_____

9. Approximately what percentage of your company's employees (full-time equivalent) was engaged in research and development (R&D) activities for the most recent financial year? _____%

10. Approximately what percentage of your company's most recent financial year sales revenue was spent on R&D activities? _____%

11. In what year did your company achieve its first international sale? 19_____

12. Approximately how many employees did your company have at the time of its first international sale? _____

13. How many employees did your company have at the end of its most recent financial year? _____

14. Did the company founder(s) have an international vision (i.e. international outlook and aspirations) for the company *at or within one year of inception*?

Yes No

15. a) In how many countries did your company sell its products and/or services during the first five years of its international activity? _____

b) Spanning how many continents? _____

c) Please list the first 5 countries below in the order of market entry:

1) _____

2) _____

3) _____

4) _____

5) _____

16. Approximately what *average* annual percentage of your company's total revenue over the first five years of its international activity was directly attributable to international sales? _____%

17. Please indicate the *level of importance* of each of the following factors to the *selection of your company's first five foreign markets*, using the provided scale ranging from 'low' to 'high':

<u>Factors</u>	Level of Importance				
	<u>Low</u>				<u>High</u>
Large foreign markets	1	2	3	4	5
Key and important industry markets	1	2	3	4	5
Following domestic customers into foreign markets	1	2	3	4	5
Unsolicited foreign orders or inquiries	1	2	3	4	5
International contacts and sales leads	1	2	3	4	5
Influence of network and alliance partners	1	2	3	4	5
Geographic closeness	1	2	3	4	5
English-speaking nations	1	2	3	4	5
Cultural similarities	1	2	3	4	5
Other (please specify) _____	1	2	3	4	5

18. Which of the following foreign market entry methods were utilized and when were they first implemented? (Please tick and provide dates for all that apply)

<u>Entry Method</u>	<u>Year</u>
<input type="checkbox"/> Exporting utilizing agents or distributors	19_____
<input type="checkbox"/> Exporting directly utilizing company personnel	19_____
<input type="checkbox"/> Licensing	19_____
<input type="checkbox"/> Establishing wholly owned subsidiaries	19_____
<input type="checkbox"/> Engaging in equity joint ventures	19_____
<input type="checkbox"/> Engaging in strategic alliances (i.e. business partnerships)	19_____
<input type="checkbox"/> Other (please specify) _____	19_____

19. Which (if any) of the following organizational activities did your company establish in foreign countries during its first five years of international activity? (Please tick all that apply and provide country locations)

Activities

Countries

- Sales & marketing offices
- Service and after-sale-support offices
- Production facilities
- R&D units
- Other (please specify) _____
- None during the first five years *

*** If you answered 'None' please proceed to Question 22**

20. If more than one foreign organizational activity or country was noted in Question 19, please indicate the extent to which you agree with the following statements regarding your company's foreign organizational activity units (i.e. offices and facilities), using the provided scale ranging from 'strongly disagree' to 'strongly agree':

	<u>Strongly Disagree</u>	<u>Disagree</u>	<u>Neutral</u>	<u>Agree</u>	<u>Strongly Agree</u>
Activities of each unit represent part of a coordinated company strategy	1	2	3	4	5
Activities of each unit benefit the entire organization	1	2	3	4	5
Communication and information-exchange flow freely between the units	1	2	3	4	5
Learning experiences are openly shared between the units	1	2	3	4	5

21. Please indicate the *level of importance* of each of the following objectives to your *company's decision to locate organizational activities in foreign countries* in its first five years of international activity, utilizing the provided scale ranging from 'low' to 'high':

<u>Objectives</u>	Level of Importance				
	<u>Low</u>				<u>High</u>
To establish a 'physical' presence in a key foreign market	1	2	3	4	5
To create the perception of a 'local' company rather than a foreign company	1	2	3	4	5
To better compete with a major competitor in its 'home-ground'	1	2	3	4	5
To meet the necessity of physically locating near an important customer's foreign site	1	2	3	4	5
To provide better regional sales and service support	1	2	3	4	5
To benefit from lower operational costs	1	2	3	4	5
To obtain high quality personnel	1	2	3	4	5
To comply with an obligation to have a physical presence in the location of a foreign funding source	1	2	3	4	5
To overcome tariff and other trade barriers	1	2	3	4	5
Other (please specify) _____ _____	1	2	3	4	5

22. Please indicate the *level of importance* of each of the following factors leading to your company's *initial involvement in international activity*, using the provided scale ranging from 'low' to 'high':

<u>Factors</u>	Level of Importance						
	<u>Low</u>						<u>High</u>
International vision of the founder(s)	1	2	3	4	5	6	7
Founders' international experience	1	2	3	4	5	6	7
Advice and assistance from governmental agencies	1	2	3	4	5	6	7
Desire to create an international mindset in the company from the beginning	1	2	3	4	5	6	7
Identification of a specific international opportunity	1	2	3	4	5	6	7
Desire to capitalize on a proprietary technology internationally	1	2	3	4	5	6	7
Desire to be an international market leader	1	2	3	4	5	6	7
Large proportion of prospective customers were foreign	1	2	3	4	5	6	7
Personal knowledge of international customers	1	2	3	4	5	6	7
International contacts and sales leads	1	2	3	4	5	6	7
OEM customers sold company's products internationally	1	2	3	4	5	6	7
Opportunity to supplement domestic sales	1	2	3	4	5	6	7
International sales were required to achieve economies of scale	1	2	3	4	5	6	7
Short product life cycles necessitated international sales	1	2	3	4	5	6	7
High R&D costs necessitated international sales	1	2	3	4	5	6	7
Small domestic market	1	2	3	4	5	6	7
Avoidance of intense or direct domestic competition	1	2	3	4	5	6	7
International and competitive nature of the company's industry	1	2	3	4	5	6	7
Need for ability to respond to competitor initiatives world-wide	1	2	3	4	5	6	7
Need for ability to pre-empt competitors	1	2	3	4	5	6	7
Pressure exerted by the company's customers	1	2	3	4	5	6	7
Influence of the company's business partners	1	2	3	4	5	6	7
Need to obtain foreign financing	1	2	3	4	5	6	7
Increased homogeneity of international markets	1	2	3	4	5	6	7
Advances in global communications, information technology and transportation reduced international business barriers	1	2	3	4	5	6	7

23. Please indicate the *extent* to which each of the following characteristics *existed* in your company during the first five years of its initial international activity, using the provided scale ranging from ‘not existent’ to ‘strongly existent’:

<u>Characteristics</u>	Existence of Characteristic						
	<u>Not Existent</u>			<u>Strongly Existent</u>			
<u>Founder(s):</u>							
International vision of founder(s)	1	2	3	4	5	6	7
Founders’ open-mindedness regarding international opportunities	1	2	3	4	5	6	7
Previous business and/or academic distinction of founder(s)	1	2	3	4	5	6	7
International experience of founder(s)	1	2	3	4	5	6	7
Industry experience of founder(s)	1	2	3	4	5	6	7
Previous start-up experience of founder(s)	1	2	3	4	5	6	7
Founders’ mix of technical and business skills	1	2	3	4	5	6	7
Founders’ determination and tenacity	1	2	3	4	5	6	7
Commitment to be an industry leader	1	2	3	4	5	6	7
Willingness to commit resources to international operations	1	2	3	4	5	6	7
Strong international business and social networks	1	2	3	4	5	6	7
Extensive planning process	1	2	3	4	5	6	7
Extensive market research	1	2	3	4	5	6	7
Obtainment of professional advice (e.g. legal and accounting)	1	2	3	4	5	6	7
Procurement of sufficient working capital	1	2	3	4	5	6	7
Focus on income generation and cash flow	1	2	3	4	5	6	7
Support for sales function	1	2	3	4	5	6	7

<u>Characteristics</u>	Existence of Characteristic						
	<u>Not</u> <u>Existent</u>						<u>Strongly</u> <u>Existent</u>
<u>Organization:</u>							
High quality personnel	1	2	3	4	5	6	7
Internationally experienced managers	1	2	3	4	5	6	7
Flat organizational structure rather than hierarchical	1	2	3	4	5	6	7
Business as well as technical orientation amongst staff	1	2	3	4	5	6	7
Strong accounting and legal functions	1	2	3	4	5	6	7
Ambitious, goal-driven internal behavior	1	2	3	4	5	6	7
Entrepreneurial spirit amongst staff	1	2	3	4	5	6	7
Customer focus throughout organization	1	2	3	4	5	6	7
Possession of a unique intangible asset (e.g. unique knowledge)	1	2	3	4	5	6	7
Engaging in strategic alliances and joint ventures	1	2	3	4	5	6	7
Utilization of business and social network relationships	1	2	3	4	5	6	7
Minimum and selective international investments (i.e. conservation of resources)	1	2	3	4	5	6	7
Tightly networked global organization	1	2	3	4	5	6	7
Advanced internal communications network	1	2	3	4	5	6	7
Flexibility and swift response capabilities	1	2	3	4	5	6	7
Distribution channel support	1	2	3	4	5	6	7

<u>Characteristics</u>	Existence of Characteristic						
	<u>Not Existent</u>			<u>Strongly Existent</u>			
<u>Product and Marketing Strategy:</u>							
Differentiated products	1	2	3	4	5	6	7
Unique, innovative products	1	2	3	4	5	6	7
High quality products	1	2	3	4	5	6	7
Customer-driven product design	1	2	3	4	5	6	7
Narrowly focused product line	1	2	3	4	5	6	7
Standardized products requiring minimal foreign adaptation	1	2	3	4	5	6	7
Products in a growth industry	1	2	3	4	5	6	7
Products that follow industry changes or shifts	1	2	3	4	5	6	7
Premium pricing	1	2	3	4	5	6	7
Providing customer-favorable sales or royalty collection terms	1	2	3	4	5	6	7
Linked product and service extensions (e.g. selling supplies or offering consulting services)	1	2	3	4	5	6	7
Clear company marketing strategy	1	2	3	4	5	6	7
Operating in international niche markets	1	2	3	4	5	6	7
Targeting similar groups of customers world-wide	1	2	3	4	5	6	7
Pre-emptive technology or marketing (i.e. being a first mover)	1	2	3	4	5	6	7
Aggressive entry into foreign markets	1	2	3	4	5	6	7
Targeting key or leading industry markets	1	2	3	4	5	6	7
Being perceived as a 'local' company in foreign markets	1	2	3	4	5	6	7
Participation in international trade shows	1	2	3	4	5	6	7
Product introduction and give-aways to academics and universities	1	2	3	4	5	6	7
Continuous innovation	1	2	3	4	5	6	7
Follow-on products from same technology	1	2	3	4	5	6	7
Expanding breadth of competence	1	2	3	4	5	6	7
Capitalizing on the company's learning experiences	1	2	3	4	5	6	7

29. Please rate the *average annual profitability* of your *company's first five years of international activity* using the provided scale ranging from 'highly unprofitable' to 'highly profitable':

Highly <u>Unprofitable</u>	Moderately <u>Unprofitable</u>	Marginally <u>Unprofitable</u>	<u>Breakeven</u>	Marginally <u>Profitable</u>	Moderately <u>Profitable</u>	Highly <u>Profitable</u>
1	2	3	4	5	6	7

Thank you very much for participating in this survey!

Please enclose a business card (including e-mail address) with the completed questionnaire if you would like to receive an executive summary of the findings.

Please return the completed questionnaire to:

Jeffrey E. Johnson
University of Strathclyde
Department of Marketing
Stenhouse Building
173 Cathedral Street
Glasgow, Scotland, U.K. G4 0RQ

APPENDIX C
INTERVIEW REQUEST LETTER

(UK)

(University letterhead)

Date

Name of prospective interviewee

Title

Company name

Street address

City and postcode

Dear (name):

I am a Doctoral Researcher at the University of Strathclyde in Glasgow currently conducting an international business study that I believe will be of interest to you. The study, for which I recently received the Scottish Enterprise John Condliffe Bursary Award, involves the identification of key success factors for American and Scottish global start-ups. More specifically, the study entails a comparative analysis of success determinants for American and Scottish high technology global start-ups, facilitated in part by my American nationality and Scottish residency. My preliminary review of your firm indicates that it experienced early and rapid globalisation and has been exceptionally successful over the years. It is my belief that a brief case study of your firm would greatly add to academic knowledge of this little studied but critically important research area. Hence, I am kindly asking for your assistance to enable the study to proceed.

I would be most appreciative if you would give me an hour of your time to gather your insights on factors that led to the early globalisation success of your firm. If you desire, I would be delighted to send you a copy of the final report upon completion. I will call you soon after you receive this letter to confirm your participation in this important study and arrange a convenient date and time for the interview. However, please feel free to contact me (jeffrey.johnson@strath.ac.uk) in advance of my call. I would greatly appreciate your assistance with this project and look forward to talking with you in the very near future. Thank you very much.

Yours sincerely,

Jeffrey E. Johnson

(US)

(University letterhead)

Date

Name of prospective interviewee

Title

Company name

Street address

City and postcode

U.S.A.

Dear (name):

I am an American Ph.D. researcher at the University of Strathclyde in Glasgow, Scotland and am conducting an international business study that I believe will be of interest to you. The study involves the identification of key success factors for American and Scottish global start-ups. Specifically, the study entails an analysis of success determinants for Massachusetts-based and Scottish high technology global start-ups. My preliminary review of your firm indicates that it experienced early and rapid globalization and has been exceptionally successful over the years. It is my belief that a brief case study of your firm would greatly add to academic knowledge of this little studied but critically important research area. Hence, I am kindly asking for your assistance to enable the study to proceed.

I will be conducting research and interviews in Massachusetts from April 5-13, 1999. I would be greatly obliged if you or an original member of the top management team would give me an hour of your time during this period to gather your insights on factors that led to the early globalization success of your firm. If you desire, I would be delighted to send you a copy of the final report upon completion. I will call you from Scotland shortly after you receive this letter to confirm your participation in this important study and arrange a date and time for the interview. I would greatly appreciate your assistance with this project and look forward to talking with you soon. Thank you very much.

Sincerely,

Jeffrey E. Johnson
jeffrey.johnson@strath.ac.uk

APPENDIX D
SURVEY COVER LETTER
(UK)

Date

«Title» «Forename» «Surname»
«Executive_Job»
«Company_Name»
«Address_1»
«Address_2»
«Post_Town» «Post_Code»

Dear «Title» «Surname»,

Survey of Key Success Factors for Early-Internationalising High Technology Firms

I am conducting an international survey that I believe will be of great interest to you and your company. The study involves the identification and comparative analysis of key success factors for early-internationalising high technology firms in the United Kingdom and the United States. Your company has been selected for inclusion in the study based on its early-internationalisation success. Your insights on this important issue would be of great value and I kindly ask for your assistance.

The survey is being conducted as the concluding phase of my PhD research requirements at the University of Strathclyde. Please be assured that the information you provide will be kept **strictly confidential** and that it will be impossible to identify individual companies in the final report. In appreciation for your contribution to this research project I am pleased to offer you a **copy of the executive summary of findings**.

Enclosed you will find a questionnaire and pre-paid return envelope. I would be most grateful if you or another executive with *founding knowledge* of your company complete and return this questionnaire at your earliest convenience. It should only require about 15 minutes of your time. If you have any questions, please feel free to contact me by e-mail at jeffrey.johnson@strath.ac.uk. Your participation would be highly appreciated and would greatly benefit the study as well as facilitate the completion of my PhD. Thank you very much for your assistance.

Yours sincerely,

Jeffrey Johnson
Doctoral Researcher

(US)

Date

«Title» «First» «Last»
«Job_Title»
«Company_Name»
«Address»
«City», «State» «Zip»

Survey of Key Success Factors for Early-Internationalizing High Technology Firms

Dear «Title» «Last»:

I am conducting an international survey that I believe will be of great interest to you and your company. The study involves the identification and comparative analysis of key success factors for early-internationalizing high technology firms in the United States and the United Kingdom. Your company has been selected for inclusion in the study based on its early-internationalization success. Your insights on this important issue would be of great value and I kindly ask for your assistance.

Although I am an American, the survey is being conducted as the concluding phase of my Ph.D. research requirements at the University of Strathclyde in the U.K., which is one of Europe's leading business schools. Please be assured that the information you provide will be kept **strictly confidential** and that it will be impossible to identify individual companies in the final report. In appreciation for your contribution to this research project I am pleased to offer you a **copy of the executive summary of findings**.

Enclosed you will find a questionnaire and pre-paid return envelope. I would be most grateful if you or another executive with *founding knowledge* of your company complete and return this questionnaire at your earliest convenience. It should only require about 15 minutes of your time. If you have any questions, please feel free to contact me by e-mail at jeffrey.johnson@strath.ac.uk. Your participation would be highly appreciated and would greatly benefit the study as well as facilitate the completion of my Ph.D. Thank you very much for your assistance.

Sincerely,

Jeffrey E. Johnson
Doctoral Researcher