

UNIVERSITY OF STRATHCLYDE

DEPARTMENT OF MANAGEMENT SCIENCE

**TELECOMMUNICATIONS AND THE STRUCTURE
OF ECONOMIC ORGANISATIONS:**

**AN INVESTIGATION OF THE IMPACT OF TELEPHONY ON
ECONOMIC ACTIVITY WITHIN A NIGERIAN FABRIC
WEAVING MICRO-INDUSTRY**

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**A thesis presented in fulfilment of the requirements for the
Degree of Doctor of Philosophy**

2006

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Acknowledgements

I am grateful to the many people that have, both directly and indirectly, helped and supported me throughout my research as well as in the writing of this thesis. I wish to thank my supervisors Jason Whalley and Fran Ackermann for their advice and encouragement. I also wish to thank the friends that have supported me through my “PhD years” - especially Funke, Joanne and Jackie for somehow always knowing the right things to say at the right time.

An African proverb states that “Patience can cook a stone”! I am indebted to my family for consistently proving this to me; you have been truly amazing and your encouragement and support continue to be invaluable.

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Abstract

Do telecommunications (telecoms) technologies contribute to the economic growth of organisations and the individuals that make up these organisations? This is the question this research sets out to answer. The study was motivated by the numerous macro-level and predominantly economic studies that suggest the existence of a causal relationship between the telecommunication infrastructure available within a country and its level of economic growth and/or development. If telecoms indeed have this causal effect why is this not being reported by studies on the everyday business lives of ordinary citizens?

This research adds to the body of literature that investigates the impact of telecoms at the micro-level. It examines the way in which telephones are used by participants in a developing country micro-industry. Furthermore, this examination is conducted in 'context' - it studies the application of telephones in fulfilling a specific need; the need to obtain and distribute information.

The research therefore begins with an assessment of the impact, lack or uneven distribution of information, has on the behaviour of organisations and individuals in a specified case industry. The research documents these impacts and investigates what the industry's response has been in overcoming the limitations they have on trade. It is in investigating the response of the industry that the contribution of telephones is examined - does the use of the telephone add noticeably to the improvement of trade in the industry?

The research found that, as stated in literature, telephones do improve the ability of industry participants to acquire and distribute information. In

some instances this improved ability has generated benefits. For example, telephones have improved the efficiency with which participants choose who to trade with. Telephones also contribute to cost savings in the industry by helping participants to economise on communication and transportation costs. Distance between production and consumption is also better managed through telecom use, and is in some cases more efficient than physical movement between places.

However, the use of telephones in certain circumstances is not always effective¹. For example, selecting the most appropriate trade partner requires access to private information about the alternatives. However, private information (i.e. information only known to one party to a trade) is mainly acquired through personal observation. When it is transmitted through a third-party it is within the context of an already established relationship based on trust or mechanism for sanctions. In an industry with low levels of trust between participants – as in the case study; acquisition, verification and distribution of private information is critical to success. Under such circumstances the mere use of telephone adds little value. However, when telephone use occurs within the context of established organisational forms in the industry, its benefits are reinforced.

¹ Effectiveness is about achieving specific goals whilst efficiency refers to the reduction of waste, expense, or unnecessary effort in achieving the goals.

Chapter 1 Introduction

1 “Are They Better Off?”

A critical part of assessing the effectiveness of development initiatives rests on our ability to determine whether people and societies are truly better off after their implementation. Since the publication of the Jipp Curve² (Jipp, 1963), researchers have repeatedly observed a positive relationship between theoretically established proxies of telecommunications (telecoms) and economic growth. In response, initiatives at both multilateral and national levels have embraced information and communication technologies (ICTs) as tools that engender development. Yet whilst the statistical signs are there at a macro-level, there is paucity of micro-level evidence that the mere application of ICTs indeed brings about development.

Research on the characteristics of the relationship between telecoms and development is on-going and as knowledge on this topic increases so too does understanding. Macro-level analysis of the link between telecoms and development continues to be optimistic and when interpreted and repackaged in the mainstream press, their results appear euphoric:

“Phones let fishermen and farmers check prices in different markets before selling produce, make it easier for people to find work, allow quick and easy transfers of funds and boost entrepreneurship ... in a typical developing country, a rise of ten mobile phones per 100 people boosts GDP growth by 0.6 percentage points.” (The Economist, 2005:53)

At the same time however, the dearth of micro-level evidence of telecoms impact has tempered the telecom-development discourse and has created an

² This is a graph that shows a positive relationship between GDP (a proxy for the wealth of a nation) and telephony density (a proxy for the level of development of its telecoms infrastructure).

appreciation of the complexities surrounding not only the technology and its implementation, but also its applicability within the environment in which it is being recommended. This realisation that the impact telecoms makes depends on the contexts (social and political) in which it is applied has broadened the scope of research. More studies are now going beyond the econometric approach of establishing impact through historical data, to qualitatively describing and documenting the uses to which telecoms are put, their impact on the user and his/her environment, and more importantly the limitations that the user and his/her environment place on the technology.

This approach to analysing the relationship between telecoms and development provides more tangible indication of whether people and societies are truly better off after the implementation of telecoms.

2 Objectives of Research

Regardless of the caveats mentioned in the preceding section (section 1) there is strong belief that telecommunications can help developing countries accelerate their pace of development or “leapfrog” stages of socio-economic growth. According to Singh (1999) this “leapfrogging” as quoted in literature refers to one of three main things:

- a. that telecoms helps developing countries skip over some stages of development and in the process become members of a post-industrial society
- b. that as an “engine of growth”, telecoms can help developing countries accelerate their pace of development
- c. and from a more technical perspective, that telecoms facilitates the skipping over of technological frontiers or product cycles.

The premise of this thesis lies within the “engine of growth” interpretation. This research investigates the role of telecoms – specifically telephones, in the

development of economic activity within a developing country micro-industry. The study's aim is to identify and document the effect telephones have on the efficiency with which trade is organised and conducted within the specified (case) industry. Furthermore, with the awareness that context is critical to telephone use; the study was grounded within a framework of information needs. As identified by Arrow (1990):

“Information, and the lack of it, and differences in information, play an absolutely key role in the way the economic system operates.”
Arrow, 1990 in Lamberton, 1998, p. 329

Entities operating within this economic system will therefore seek to acquire information at the least cost possible. This desire for 'affordable' information is said to provide the rationale for collective action through the formation of organisations (Williamson, 1975; Arrow, 1974 and 1979; Radner, 1986 as cited in Monk, 1989). Also, telecoms have been documented to result in the more efficient organisation of economic activity (Chowdhury and Wolf, 2003; Dutta, 2001; Beede and Montes, 1997; Saunders et al., 1994). By enabling the effective and efficient coordination of activities, telecoms allow production, distribution, and management activities to be allocated between more, or the most appropriate members of an organisation. These technologies reduce transportation and communication costs and thus aid with the management of distance and communication between economic entities during the process of trade.

Demand for information is thus defined to be a key driver of demand for telephones and the research approaches its investigation on this premise. First an understanding of the requirement for information in the case industry was established. This was achieved by documenting and analysing the occurrences of information imperfections in the industry and the limiting effect they were having on trade. The techniques and mechanisms the industry had adopted in response to such limitations were then identified

and outcomes of such techniques/mechanism on the organisation of economic activity discussed. It is upon this background that the role of telephones in facilitating these techniques/mechanisms is discussed as well as the economic impact on those industry participants that utilise it.

The main contribution of this research is that it builds understanding of how telephones are used in improving economic activity at a level that impacts directly on a key target of development initiatives. The research was conducted on a micro-industry located in the informal sector of a developing country. Micro- and small-enterprises operating in this sector have been directly linked to the main objectives of development. These include increased production, employment and wealth creation. They are therefore important to the goal of poverty reduction (see Palmer 2004 and references therein). Technology that enhances the activities of participants engaged in the informal economy can therefore be said to enhance the economic development potential of such participants. Thus by examining the manner in which telecoms can be used to enhance the economic development of an industry, this research sits within the broader context or field of 'development studies'; specifically the branch focused on how technology can be used to deliver and/or attain development goals

3 Structure of the Thesis

The way in which this thesis is structured is represented in the diagram below - Figure 1. This chapter has introduced the research, briefly highlighting what its objectives are and the rationale/motivation for the study. The chapter now proceeds to explain the structure of this thesis - a type of document map that highlights what the reader should expect to see and in what order.

Chapter 2 is the first of two reviews of literature on the relationship between telecoms and development. The chapter summarizes with the aid of an influence diagram, some of the macro-level conceptual and empirical studies that identify and explore the factors and variables that define the relationship between telecoms and economic growth. Both macro-economic and micro-economic studies are reviewed. Macro-economic studies examine the level of a country's telecom network and its economic prosperity whilst micro-economic studies examine the manner in which telecoms exerts its influence on economic growth and vice versa.

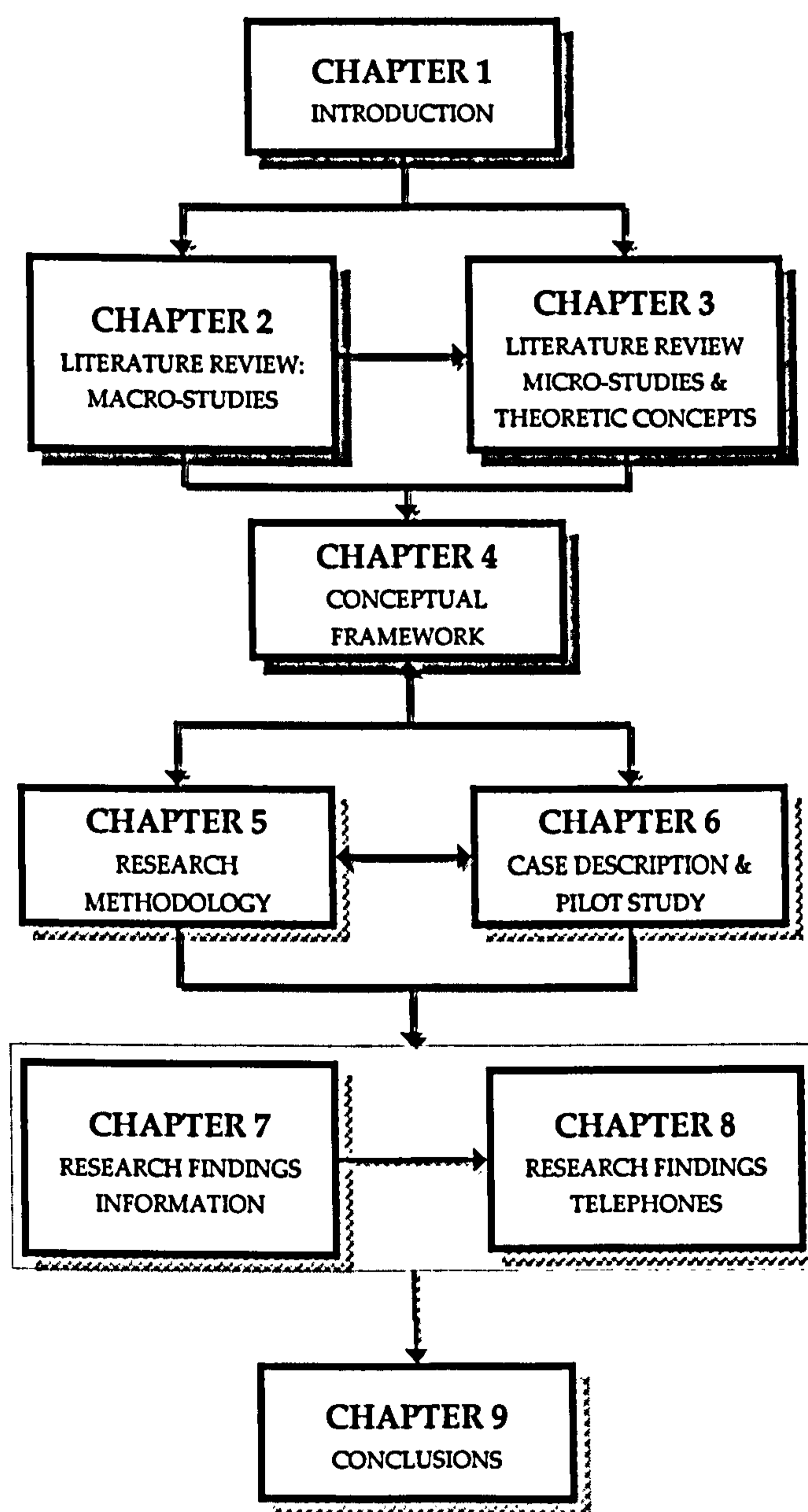


Figure 1: Structure of Thesis

Chapter 2 also reports on analysis conducted on the influence map created which revealed some of the limiting factors on the otherwise positive (reinforcing) association between telecoms and economic growth.

The literature review continues in Chapter 3. This chapter however takes a micro-level perspective by reviewing studies conducted at organisational, household and individual levels. The chapter looks for examples to confirm and/or support the general theory that telecommunications contributes to economic growth. Chapter 3 also sets out the theoretic literature from which the conceptual framework for the research is constructed. Literature regarding the importance of information (or the lack of it) in governing the manner in which trade occurs is discussed as is the manner in which distance exacerbates these effects of information. The concept of intermediation as a way in which organisations manage both the need for information and the effect of distance are introduced, and the chapter concludes with a discussion of the possible contribution of telecoms to the function of intermediation.

The conceptual framework used by this research is presented and discussed in Chapter 4. This conceptual framework amalgamates the key concepts or variables identified as being important to the study of telecoms and economic growth.. These concepts include: information, its impact on economic organisation, and the use of telecommunications in managing this impact. The chapter concludes by identifying and discussing the suppositions that will be examined by the research.

Conceptual frameworks help researchers to assess the purpose of their study, to develop and select realistic and relevant research questions and methods, and to identify potential validity threats to research conclusions. Chapter 5 discusses each of these methodological elements and describes the approach

adopted in conducting this research. Chapter 5 discusses the methods adopted for data collection and analysis and highlights the steps that were taken to address threats to the validity of the selected methodology.

Chapter 6 describes the case industry in which this research was based. The chapter begins by introducing the informal sector of developing countries and the ties this sector has to economic development. The chapter then describes the case industry - the *Aso Oke* industry, and includes a brief overview of current thinking on its evolution. How the industry is structured economically and the different types of roles participant play are also discussed. The chapter concludes by detailing the types of organisational forms that were identified during an exploratory (pilot) study of the industry.

The findings of the field study are presented in Chapter 7 and Chapter 8. The aim of these chapters is to provide an understanding of what was observed in the case industry regarding the relationship between telephone use and the improvement of trade. This was done by breaking this relationship up into its constituent parts, Chapter 7 therefore presents the findings of the study in relation to the need for information in the industry, whilst Chapter 8 documents the ways in which telephones are used in the industry to fulfil this need.

Together these chapters present evidence that supports, refutes, and/or provides further clarification on each of the research's suppositions. Chapter 8 also contains a comparison of the findings of this research with the expected benefits of telephone used defined in theory and related studies. This comparison (of expected benefits with actual findings) allows for the drawing of conclusions on the impact of telephones on the case industry.

Chapter 9 highlights the theoretic and practical contributions of the research to the existing body of literature. The limitations of the research are also discussed and the chapter concludes by discussing opportunities for further research.

Chapter 2 Literature Review: Macro-level Studies of the Relationship between Economic Growth and Telecommunications

1 Introduction

The previous chapter set out the layout of this thesis and also provided an introduction to the broad terms underpinning this research. This included an overview of the term *Development* as well as arguments on the applicability of technology in delivering development goals and targets. Furthermore, the discussion on the use of technology for development purposes was limited to the application of telecommunication (telecom) technologies. This chapter summarizes some of the conceptual and empirical studies that have examined the impact telecommunications has on development.

2 Representing the findings of the literature review

The main purpose of the review of literature conducted for this study was to identify and explore the factors and variables that define the relationship between telecommunications and economic growth. A large body of literature exists on the relationship between telecoms and both societal and economic measurements of development and in order to present a verifiable review of this body of literature without falling prey to anecdotal generalisations, an abstracted picture was constructed to set the boundaries for the review and also organise the literature in a coherent manner. The result is the influence diagram that accompanies this chapter (Attachment 1) and presents the various variables which, according to the literature, define the relationship between telecoms and socio-economic development. The diagram thus serves as a navigation tool for the complex interactions between these variables.

'Interactions' in the diagram are defined by the links between variables and are directional as well as correlational; i.e. the map assumes that variables influence one another, either by bringing about the existence of each other or by increasing or decreasing each other's propensity. In this manner, the attached influence diagram illustrates the patterns (labelled in the map as *cycles*) that were seen emerging between the findings of the various articles and texts analysed as part of the literature review. The diagram therefore serves to illustrate the way these findings fit together to provide a holistic picture of the impact telecommunications has on development. Although this picture does not depict all the possible variables that can be associated with the relationship between telecommunications and development; it does nonetheless presents key thinking and can be verified by further research. As stated by Miles and Huberman (1994):

"...these 'verifications' will come down to a matching of interpretations based on diverse experience, and interpretations will not always fully overlap. Still there will be grounds for assessing and adjudicating the plausibility of different accounts." (1994, p. 153)



2.1 Guidelines to reading the Influence Diagram



Based on the findings of the studies that were reviewed and the views expressed in literature, two main types of *cycles* are represented in the influence map diagram. The first, which are highlighted in bold and shadowed and are used to represent associations between variables that are of direct relevance to this thesis – i.e. of direct relevance to the relationship between telecoms and economic growth. The second types of cycles are not highlighted in bold (and do not have a shadow) and refer to associations between variables which although indirectly relevant to the subject of the thesis, yet provide context that is critical to understanding how telecoms and economic growth may be interrelated.

The association or linkages between the variables identified in the diagram are represented by arrows and these are also of two types: solid arrows represent links that have been empirically established in literature, and dotted arrows refer to relationships or connections between variables that have been logically inferred to in the literature. These arrows are furthermore colour coded to help in distinguishing the type of association that exists between variables. Black lines (all of which are solid lines) depict empirically established relationships. Blue and gold (which are all dotted lines) depict logically inferred relationships; blue for those that have been identified by the author as being of primary relevance to the corresponding variable, and gold for those that are secondary (yet relevant) to the corresponding variable.

At the arrow point of each line is one of two possible signs representing the impact one variable (at which the arrow originates) has on the other (at which the arrow terminates); a plus sign: "+" indicates a positive or increasing impact -i.e. increases in the originating variable tend to result in observed increases in the terminating variable and vice versa. A minus sign: "-" indicates a negative or decreasing impact -i.e. increases in the originating variable tend to result in observed decreases in the terminating variable and vice versa.

There are also four symbols which are used in the influence diagram:

1.  A lightning bolt signifies factors that have a constraining effect on the relationship represented by the arrow on which they are featured. That is they limit or inhibit the extent to which the corresponding variables either bring about the existence of each other or increase/decrease each other's propensity
2.  A law enforcement cap signifies factors that have regulating or reinforcing effects on the relationship represented by the arrow on which they are featured.

3.  Slanted double red lines indicate factors that have a delaying effect on the relationship represented by the arrow on which they are featured.
4.  For presentation purposes (particularly to minimise criss-crossing of lines depicting relationship) a box with a camera at the top left-hand corner is used to identify variables that have been duplicated in the map.

As noted at the start of this chapter, the main purpose of the literature review was to identify and explore the factors and variables that define the relationship between telecommunications and economic growth, and as such the following overview of the literature is organised according to the type of result or conclusion generated by the studies. The pivotal relationship to this thesis, representing the interaction between telecoms and economic growth, is depicted by the “Economic Cycle” and forms the starting point of this review. The overview of the Economic Cycle also includes descriptions of findings of more detailed causal studies on the link between telecoms and development, including those that investigated the type of economy (whether developed or developing) that benefit most from telecom investment, and studies examining the manner in which telecom investment actually influences economic growth. The summary of the Economic Cycle leads to an overview of the associated Market and Organisational Cycles.

2.2 Caveat on findings of the influence map: note on methodology

When mapping the microeconomic benefits of telecommunications to the macroeconomic variables that quantify development, a lot depends on the methodology used by the researchers that are reporting the relationships. Methodology is therefore often the basis of much of the criticism of literature in this field and can be shown to have followed an evolutionary trend of its own.

Studies of the relationship between telecoms and economic development can be grouped according to the statistical approach they utilize – correlation and regression, causal econometric, or structural econometric analyses (Madden and Savage, 2000). The positive correlations between measurements of telecoms infrastructure and indicators of economic development that were reported by early studies (Saunders et al., 1983 and references therein; Hardy, 1980; Jipp, 1963) and some later ones (Alleman et al., 1994) have generally been taken as evidence of the existence of a causal or structural link between the level of a country's telecoms network and its economic prosperity. However, the statistical procedure applied by these studies was one that fitted a simple regression line³ and as such they were limited in the conclusions they could make. In particular, they were unable to comment on the link in the opposite direction, i.e. that between the level of a country's prosperity and the level of development of its telecoms network. The optimistic reports emanating from such analyses can therefore be criticized for not being able to clarify which of the two effects – telecoms effect on economic growth, or economic growth on telecoms - or what combination of these two effects was being observed.

Amendments to these early statistical procedures came in the form of causal econometric approaches that attempted to infer the direction of influence between the two variables (telecoms and economic growth). The combined result from this amended approach reported a bi-directional link between the two variables – increased telecommunications infrastructure stimulates economic growth (Lee, 1994) and this growth in turn leads to increase in the demand for telecoms infrastructure (Madden and Savage, 1998; Cronin et al., 1991). Within this genre of econometric analysis Norton (1992) applied a more structured two-equation simultaneous model in investigating causality

³ That is an equation that described telecommunications as a function of economic growth.

- one equation describing telecommunications as a function of growth and the other describing growth as a function of telecommunications. This was done to reduce the possibility of overestimating the impact telecoms has on economic growth. Whilst Norton also finds evidence supporting bi-directional causality, his model has been criticised for being statistically underidentified⁴ (see Bedi, 1999 for more details, also Röller and Waverman, 1996, 2001). This criticism stems from the belief that the relationship between telecoms and economic growth cannot be adequately estimated using data on only two variables. At least one more observable is required, one that describes telecoms as a function of growth but not growth as a function of telecoms (Jonscher, 1981).

Another drawback of the statistical approaches discussed so far is their loss of detail through aggregation. A great deal of the variety in the underlying pattern of use of telecommunications in the economy is lost in the process of aggregating all such use into a single variable (Moss, 1981). This means that such studies find it hard to quantify the economic activity that is directly attributable to telecoms investment and to measure it as a distinct variable, separate from other correlated growth promoting measures such as investments in research and development, human capital, taxes etc. (Röller and Waverman, 2001).

Structural econometric analyses (Greenstein and Spiller, 1995; Maddock, 1995; Welfens, 1995) examine the impact benefits from investment in telecoms infrastructure have on the wider economy (Madden and Savage, 2000) and were therefore a natural progression from causal analyses. Some of these studies break down the economy into sectors and then analyses the level of input telecommunications makes to these sectors (see for example Cronin et

⁴ Meaning it has an insufficient amount of information to estimate the number of parameters

al., 1993). They therefore seek to define the value of input of telecoms that is required to produce a unit of output in each of the sectors of the economy (see Correa, 2003). However, to achieve this, sector analysis makes the erroneous assumption that each sector requires a fixed level of telecoms input per unit output; the analysis therefore limits the extent to which substitutability among inputs can be modelled. Various micro-analytical research approaches have developed in response to this drawback, and some provide detailed studies of the precise manner in which telecoms fits into a business's communication activity, and of the manner in which the role of these services could change as technology develops, relative prices fall, and institutional barriers are overcome (see Brynjolfsson and Hitt, 1996; Lal, 1996). Whilst allowing for flexibility and realism in the study of specific applications of telecoms, such approaches are however time consuming and as a result can only be applied to a limited range of examples.

Thus whilst micro-analytical studies reporting indirect benefits of investment in telecommunications now sit alongside macro-economic investigations of the relationship between a country's overall level of development and the level of development of its telecom infrastructure, the challenge for researchers has been in validating generalisations made from the evidence of micro-studies and aggregating such evidence to distinct macro-economic impacts. Conversely, it has also been difficult to reliably disaggregate the effects of telecoms observed at the macro-economic level to the economic agents assumed to be responsible for such effects. Thus, in examining the results reported in the literature using the influence diagram developed for the literature review presented in this thesis, it is important to note that the specific links that drive micro-macro interactions are a 'tenuous thread' (Analysys, 1997).

3 The Economic Cycle

The 'Economic Cycle' forms the starting point of the literature review and highlights the findings of macro- and micro-economic studies on the relationship between telecom infrastructure and some proxy of economic growth. Jipp (1963) was the first to identify a positive association between national telecom density and national income; since his publication, and irrespective of the level at which analysis is conducted, a positive relationship is repeatedly observed between theoretically established proxies of telecom and economic growth. For example Bebee and Gilling's (1976) cross-country analysis reported a significant statistical relationship between indices of economic performance and telephony. At the country level, results obtained by Alleman et al. (1994) showed telecom investment promoted economic development within the Southern African Development Countries (SADC); and using data on the United States, Dholakia and Harlam (1994) observed that investments in telecom had a strong influence on economic activity. Wang (1999) detected that telecom investment had a strong impact on economic development in Taiwan; and Yoo (2001) found the same impact on economic development in Korea.

At lower levels of analysis, Cronin et al.'s (1993) study using data from one US state and its counties showed that the relationship between economic activity and telecom infrastructure observed at national levels could also be observed at the State level. At the industry level, Greenstein and Spiller (1995) whilst estimating the effect improvements in telecom infrastructure had on economic activity discovered that telecoms has a stronger influence on "high tech white collar activity" than on manufacturing activity. The link between telecom and economic activity observed at nation- and state-levels is therefore also identifiable at the industry level.

These empirical studies are complemented by less rigorous causal studies that aim to identify causality between telecoms and economic growth, and (in some cases) infer the direction of the observed causality. One of the first of such studies by Hardy (1980) reported a bi-directional or reciprocal causal relationship between telephones and economic development. This result infers that telephones enhance economic development which in turn stimulates an increase in the demand of telephones in the nation. Bi-directional causality was also observed by Edirisuriya (1995); and with respect to country specific studies by Cronin et al. (1991) - based on analysis of 31 years of US data, and in Madden and Savage's (1998) study of transitional Central and Eastern European (CEE). Lee's (1994) analysis using data from South Korea also found support for a bi-directional causal relationship, as did Yoo and Kwak (2004). Kim (1992) on the other hand analysed quarterly data from South Korea as well as for 32 other countries (representing different global regions) and found the causal relationship between the telecom sector and the national economy not prominently evident or decisive. Although this result was cited by the author as being possibly due to analysis on a small sample of data, his other finding that causality might be stronger in one direction is echoed by other studies:

“...the telecommunications sector causes or precedes the national economic growth in less developed countries including Korea, while the opposite tendency is more visible in advanced countries.” (Kim, 1992, p.197)

Dutta (2001) also reports a stronger direction of causality from level of telecom infrastructure to economic growth than from economic growth to level of telecom infrastructure. This stronger causality from telecom investment to economic development was also reported by Zhu (1996).

Irrespective of the uncertainty over which direction of causality is stronger, the key conclusion to be drawn from the above is that the relationship between telecommunication and economic growth is bi-directional:

“complementary and self-reinforcing” (Hukill, 1991). This is depicted in the influence diagram by the Economic Cycle with the variables “Telecommunication investment”, “Telecommunications infrastructure” and “Economic growth”, all of which are highlighted in bold font.

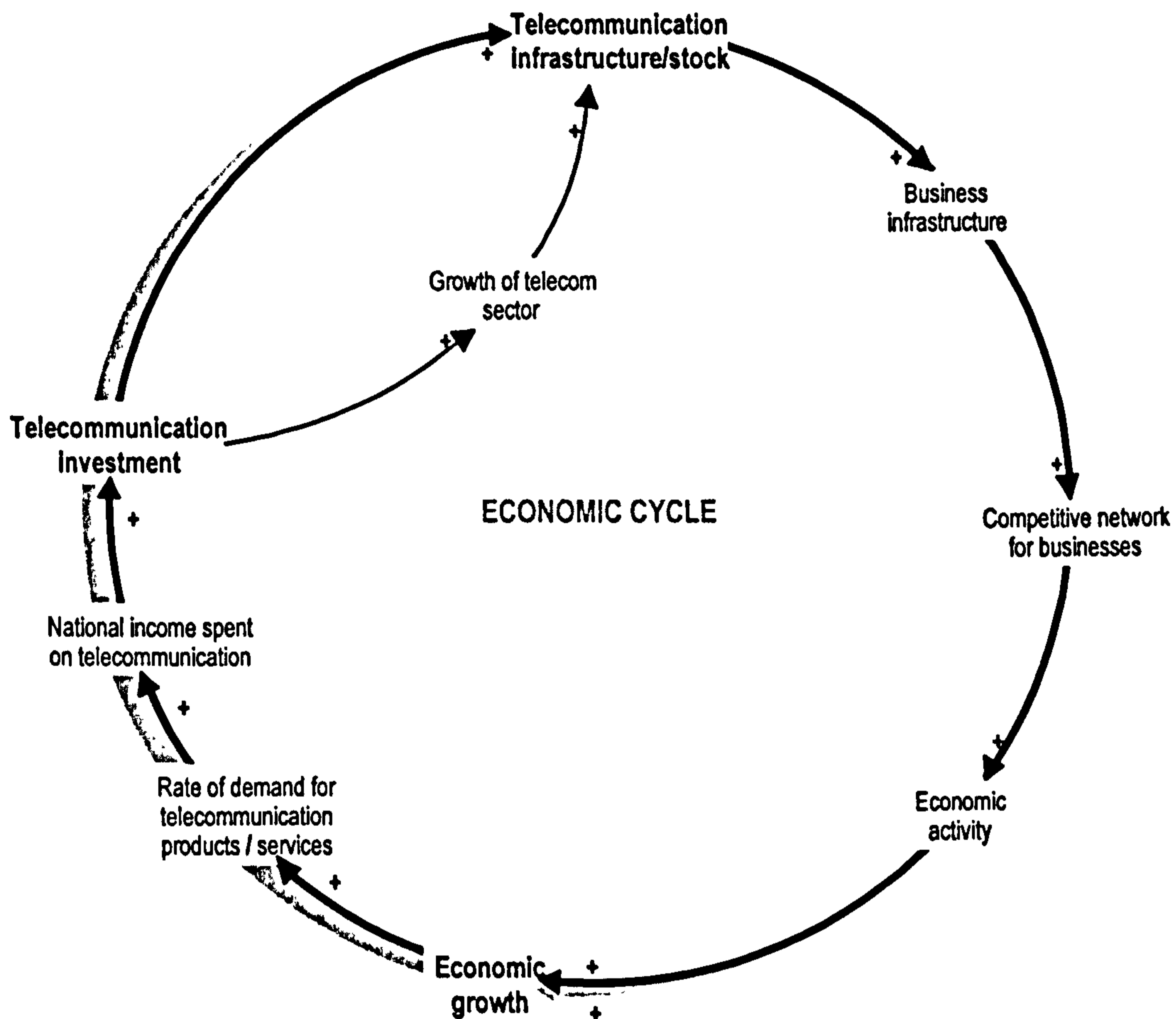


Figure 2: Sub-section of Influence Diagram: The Economic Cycle

Depending at which point the reader starts, one variable is seen to have an increasing or positive impact on the other. Increases in telecom investment result in increases in telecom infrastructure⁵. Telecom infrastructure, from the perspective of economic growth, is described in terms of its integration

⁵ Although telecom investment has been shown to relate significantly to telecom stock, Dutta (2001) emphasises the distinction between investments in telecommunications infrastructure and the infrastructure itself by noting that investment is a periodic monetary flow whilst infrastructure is physical stock resulting from a series of investments. In any given period, it is the accumulated physical infrastructure in its entirety and not just the portion resulting from any one investment that is available to support economic activity and as such “telecommunications infrastructure stock” rather than figures relating to telecom investments should be used in hypothesizing causality with economic output.

with business infrastructures and its contribution in facilitating an enabling environment for competitive business activities (Straubhaar, 1995). Increased economic activity is thus seen to accompany increases in efficient business infrastructure and in this way telecom investment promotes economic growth, which in turn leads to increases in the demand for telecom infrastructure and consequent increases in telecom investments (Cronin et al., 1991).

3.1 Developed versus Developing Economies

In addition to trying to establish direction of causality, studies have also tried to determine which type of economy (developed or developing) benefits the most from investments in telecommunication. As mentioned earlier, Dutta (2001) reported a stronger direction of causality from level of telecom infrastructure to economic growth. This stronger direction of causality was exhibited by both developed and developing economies (even though the former tends to have more developed service sectors that are heavily dependent on telecoms). Other studies however find that the largest effect of telecom investment on economic growth occurs in less developed economies (Hardy, 1980; Kim, 1992; Dholakia and Harlam, 1994). Hardy (1980) and Cronin et al. (1991) found that the intensity of the effect telecom investment has on economic growth is inversely related to the prior level of telecom development in the country. This implies that the impact of telecom investment levels on economic growth will be high in economies with low telecom infrastructure stock. This implication was echoed more recently in Waverman et al.'s (2005) study on the impact of mobile telephony on the economic growth of developing countries:

“We find that mobile telephony has a positive and (statistically) significant impact on economic growth, and this impact may be twice as large in developing countries compared to developed countries.” (Emphasis was added by the authors of the publication; Waverman et al., 2005, p. 11)

Sridhar and Sridhar (2004) also found that telephone penetration correlated with aggregate output (measured by change in gross domestic product), and were able to estimate that a one per cent increase in teledensity (total telephones per 100 population) increases national output⁶ by 0.14 per cent. This impact was however found to be less in lower-income countries⁷. Based on this result Sridhar and Sridhar (2004) distinguish the impact mobile phones had on output (as distinct from main land lines) and found, similar to the Waverman et al. (2005) study, that this was statistically significant. They calculated that a one per cent increase in mobile phone penetration can cause national output to increase by up to seven per cent.

Dewan and Kraemer (2000), on the other hand, found returns on telecom investment to be positive and significant for developed countries, but not statistically significant for developing economies. Pohjola (2000) found telecommunications investment to have significant impact on GDP growth on a sample of 23 developed countries but not when the sample was enlarged to include an additional 15 developing economies. An explanation for this discrepancy may have been provided in a study by Röller and Waverman (2001) who, using data on 21 OECD countries over a 20 year period, found a positive causal link between telecoms and economic growth under the condition that a critical mass of telecom infrastructure is present. This suggests that telecoms has a non-linear influence on economic growth, with growth effects being significantly higher for countries whose infrastructure approach the critical mass - defined in the Röller and Waverman paper as "universal service"⁸. Belaïd (2004) tested the Röller and Waverman condition on a selection of developing countries and found that

⁶ Measured by the authors using a macro production function

⁷ Based on World Bank country groups definitions

⁸ A minimum threshold of telecom density of around 24 percent must be achieved in order for telecoms to generate growth (Röller and Waverman, 1996 cited in Bedi, 1999).

non-attainment of a critical mass of telecom infrastructure indeed proved to be a constraint on expected growth benefits.

This is not to say that important growth effects do not exist for countries with low telecom penetration rates, they do (Clarke and Laufenberg, 1981 as cited in Pierce and Jéquier, 1983; Yoo, 2001; Sridhar and Sridhar, 2004). However, marginal improvements in the telecom infrastructure of countries with low levels of telecom stock do not generate the expected (aggregate) economic growth effects projected for them. Furthermore, telecom utilisation rate increases faster as a country becomes more developed (Bebee and Gilling, 1976; Saunders et al., 1994), and this suggests that the rate of cost savings from telecom use is positively correlated with stages of economic development (Nadiri and Nandi, 2003). Substantial investments in infrastructure is therefore required in developing countries before the growth-generating effects of telecoms can be experienced (Bedi, 1999).

3.2 Economic Cycle: Mechanisms for funding telecom investments

The findings above have significant impact on the ability of developing countries to achieve the positive growth effects they desire via the development of their telecom infrastructure. As Collins (2000) points out such countries are faced with resource constraints and lack the hard currency and capital investment to fund such high levels of telecommunications infrastructure development. Furthermore, as stated by Dholakia and Harlam (1994) the question of financial resource constraint is not one of simple trade-offs between investing in one development input like education, energy and physical infrastructure and not in others; rather concurrent investment has to be made in multiple inputs including in education, telecommunications and other physical infrastructure. Developing countries cannot therefore afford to divert funding from one (development orientated) initiative to another but must instead look to alternate funding mechanisms. The possibility of

achieving telecom induced growth opportunities therefore indirectly depends on the ability of developing countries to attract and implement funding that are external to their national income.

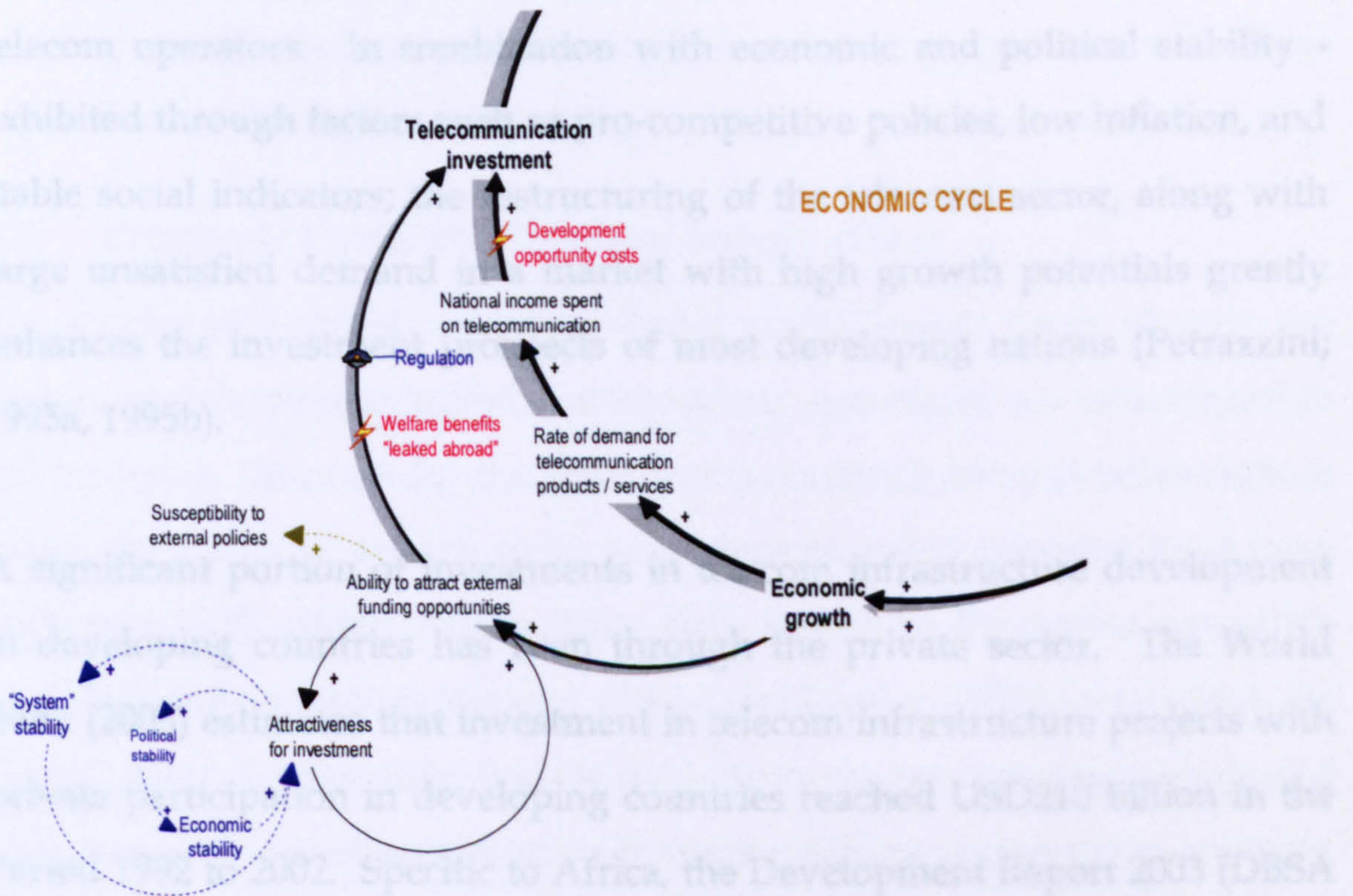


Figure 3: Sub-section of Influence Diagram: The Economic Cycle - Funding mechanism

This is represented in the influence diagram via the link between “economic growth” and the “ability to attract funding”. In general, the more (potential for) sustainable economic growth exhibited by a developing country the more attractive it is for investment. Incentive to actively seek funding is found in the assertions found in development and wider literature; for example Roller and Waverman (2001), Parker et al. (1989), Saunders et al. (1983) all state that the external economic benefits of telecoms are much greater than the returns on investment that accrue to the investing organisation. As the quality and sophistication of the infrastructure increases so too does the derived services it generates and the enabling impact it has on the economy as a whole. There is therefore pressure on developing countries to create and maintain an environment that is

conducive for growth, and attract investments whether through loans, via multilateral lending institutions, and/or through foreign investment (Bande, 1995; Straubhaar, 1995). A means by which this has been achieved has been through the liberalization of the telecoms sector and privatization of national telecom operators. In combination with economic and political stability - exhibited through factors such as pro-competitive policies, low inflation, and stable social indicators; the restructuring of the telecoms sector, along with large unsatisfied demand in a market with high growth potentials greatly enhances the investment prospects of most developing nations (Petrazzini; 1995a, 1995b).

A significant portion of investments in telecom infrastructure development in developing countries has been through the private sector. The World Bank (2005) estimates that investment in telecom infrastructure projects with private participation in developing countries reached USD210 billion in the period 1992 to 2002. Specific to Africa, the Development Report 2003 (DBSA and NEPAD, 2003) notes that

“Over the past two decades, private capital flows have surpassed official development assistance as the primary source of investment capital in developing countries” (cited in Abrahams, 2004, p. 102)

Furthermore, of the ten largest infrastructure projects with private finance in sub-Saharan Africa, five were in the telecommunications sector (DBSA and NEPAD, 2003). Such investments however come at some cost to the autonomy of countries seeking investment; attracting private finance often requires the completion of “the basic reform agenda” (World Bank, 2005) and increases the susceptibility of countries to external policies such as reforms covering Foreign Direct Investment (FDI); WTO telecommunication commitments; regulatory controls relating not only to the telecom sector but also to financial markets and trade; the update of corporate laws and taxation rates etc. In addition, the higher the proportion of foreign ownership of telecom companies operating in the host nation, the larger the fraction of

total benefits emanating from the investment that may be “leaked abroad” (Tandon and Abdala, 1992, p.41, cited in Petrazzini, 1995b, p.174). For example, Petrazzini (1995b) and Kezang and Whalley (2004) report that private firms select equipment suppliers predominantly on political and non-market criteria; this means that some investment opportunities in local capabilities are lost by the developing economy.

3.3 Economic Cycle: the “leading sector” effect

The studies and articles reviewed under the Economic Cycle identify the impact of telecommunications on economic growth is an economy-wide phenomenon. In order for the claim that a country’s telecom infrastructure affects its economic growth to be valid, investment in telecoms must have spillovers and create externalities that influence the entire country’s economic and social development (Pierce and Jéquier, 1983). As a result, the cost of poor telecommunications is paid for by the economy as a whole and conversely, the benefits of better telecommunications accrue to the economy as a whole and not just to the direct consumers of the service.

Economic growth however involves multiple development inputs including education, investments in research and development, human capital, etc. and it is difficult to quantify and measure the economic activity that is directly attributable to telecom as distinct from other correlated growth promoting inputs (Röller and Waverman, 2001). Maddock (1995) however found that the telecom sector grows faster than the overall rate of a nation’s economic growth and promotes nation-wide productivity. Similar findings by Jussawalla (1999) and Röller and Waverman (1996) have led to the conclusion that telecom infrastructure acts as a boost to national productivity and the classification of telecoms as a “leading sector” in the economy. Other studies reporting this leading sector effect include Nadiri and Nandi’s (2003) analysis of 34 sectors and industries of the US economy and Madden and

Savage's (2000) study on the People's Republic of China and Chinese Hong Kong. Madden and Savage (2000) found that the faster growing telecom sector was at the forefront of these economies, and were contributing to improved productivity by speeding up the diffusion of information, and assisting in the acquisition of a higher level of skills by the workforce. Zhao and Junjia (1994) also concluded that increased investments in telecoms in China led to more efficient use of energy, labour and capital.

4 The Market and Organisational Cycles

Precisely how telecom exerts its influence on established proxies of growth has been the focus of various studies. These studies analyse the impact investments in telecom infrastructure have on the wider economy and are the focus of this section of the literature review. Due to the emphasis this thesis places on economic growth, this review begins with reported impact of telecoms on business activity. According to Straubhaar (1995), the increased availability of telecom infrastructure, particularly in terms of newer, cheaper services and equipment that conform to world standards, facilitates the competitiveness of businesses and leads to increases in economic activity.

4.1 Organisational Cycle: Telecoms' impact on management

Most of the studies on the causal relationship between telecom infrastructure and economic development are productivity analyses. Some of these studies focus on the impact of telecoms on business organisations and find that telecom leads to better management within businesses (Keating, 2001; Hagström, 1995; Cronin et al., 1991). It is therefore inferred that by increasing the availability and quality of information, telecoms leads to a reduction in uncertainty allowing for more informed and improved decision-making. Furthermore, due to its interactive communication and negotiation capabilities, telecom also makes decision making faster (Bedi, 1999). The aggregate impact is an increase in the quality and efficacy of economic and

organisational decisions, which has a positive influence on the economic output of businesses. Lee's (1994) examination of the relationship between telecoms and economic development in South Korea affirms this. Lee focused on the impact telecom infrastructure had on geographical co-ordination and noted that managers were able to communicate with each other rapidly and cheaply over increased distances. Telecom therefore enables organisations to lower their cost structure by facilitating the adoption of the most cost effective organisational structure; and has been referred to as a primary and indispensable contributing factor towards the globalization of different corporations and the interconnection of world markets (Nadiri and Nandi, 2003).

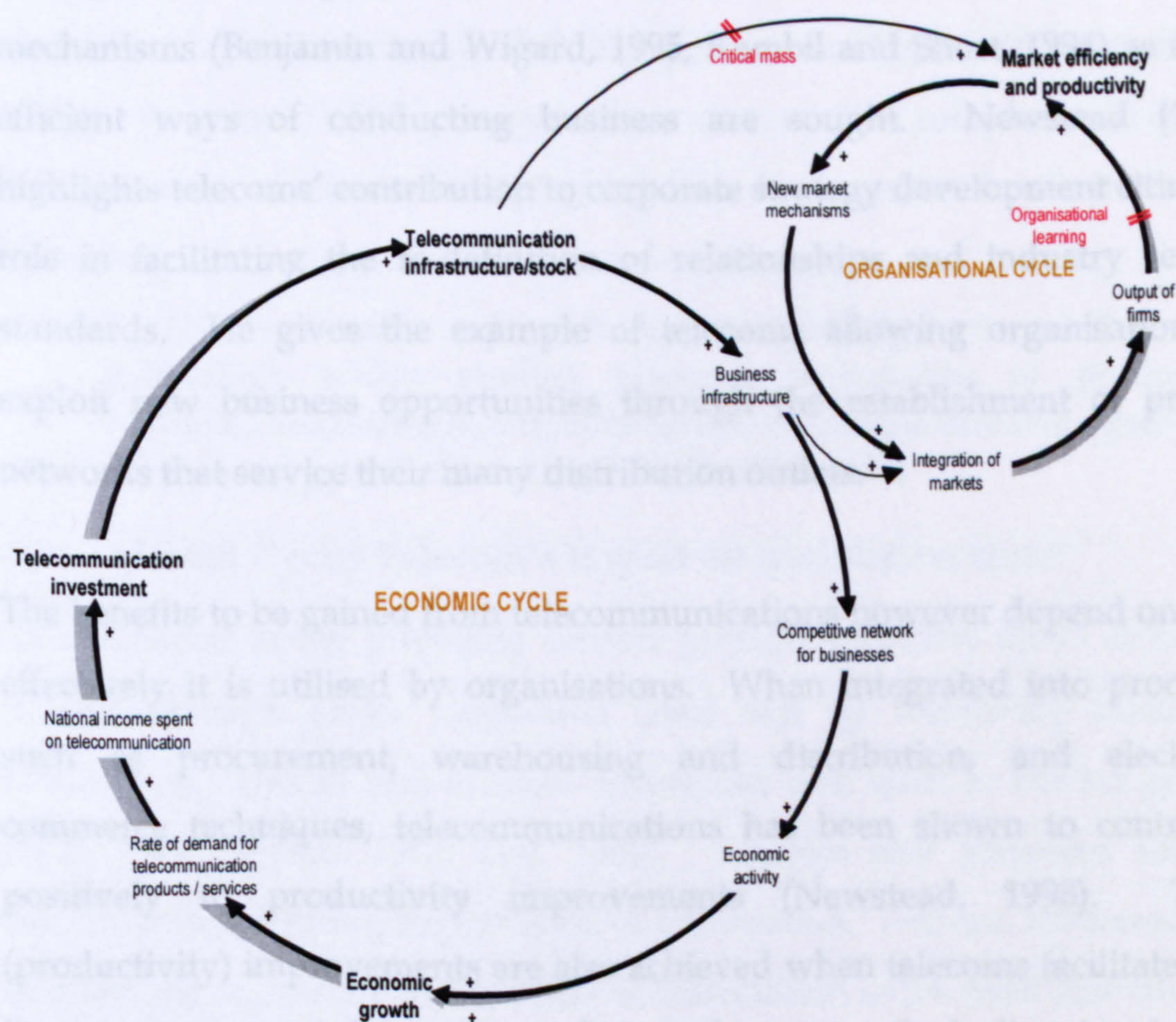


Figure 4: Sub-section of Influence Diagram: The Organisational Cycle

By reducing the constraints of time and distance, telecoms is cited as enabling the location of functional and business units at the most effective geographical location, thus enhancing organisational and market flexibility

without compromising on control (Bande, 1995; Hardy, 1980). Such organisational changes may result in improvements in the integration and efficiency of markets, and the benefits of better integrated markets include reductions in the transaction costs of ordering, gathering of information, and searching for new services. It has been proposed that these benefits contribute towards reductions in the cost of doing business, and an increase in the output of firms (as illustrated in Figure 4) (Newstead, 1998; Norton, 1992; Keen, 1988). Collectively, this increase in output manifests itself as increases in overall market efficiency and productivity (Keating, 2001).

Furthermore, the improved efficiency of markets and enhancements to the management of organisations also leads to the creation of new market mechanisms (Benjamin and Wigard, 1995; Kambil and Short, 1994) as more efficient ways of conducting business are sought. Newstead (1998) highlights telecoms' contribution to corporate strategy development citing its role in facilitating the re-definition of relationships and industry service standards. He gives the example of telecoms allowing organisations to exploit new business opportunities through the establishment of private networks that service their many distribution outlets.

The benefits to be gained from telecommunications however depend on how effectively it is utilised by organisations. When integrated into processes such as procurement, warehousing and distribution, and electronic commerce techniques, telecommunications has been shown to contribute positively to productivity improvements (Newstead, 1998). These (productivity) improvements are also achieved when telecoms facilitated on-line management information and control systems (including just-in-time inventory control, and financial and marketing management systems) are used to improve management effectiveness. Case studies by Keen (1988) report reductions in inventory costs of as high as 20% in a selection of

industries (including retailing, automotive, and the oil industry). Other similar benefits – on firm size and the allocation of decision rights among the various actors in a firm have been documented by Gurbaxani and Whang (1991).

On the other hand, there are studies that do not support conclusions of telecom induced productivity both at global or national levels (see Smith, 2001; Bedi, 1999 and references therein; Baily, 1986). The results of these studies promoted the concept of a “productivity paradox” – i.e. that huge investments in information technologies (IT) were not generating anticipated gains in productivity. Later studies have however suggested that positive effects of IT investments on productivity manifest and are measurable only after a time lag⁹ (Dedrick et al, 2003; Brynjolfsson and Hitt, 1996; Brynjolfsson, 1993). Avgerou (1998) proposes that, due to the complex and novel characteristics of these technologies, this lag is due to a period of organisational learning:

“...IT investments represent a new paradigm in product and technology which renders previous knowledge of production obsolete. Accordingly, organizations will become efficient again only after a long period of learning.” (Bedi, 1999, p.21)

4.2 Market Cycle: Telecom’s impact on transaction costs:

As mentioned in the preceding section, telecom generates direct economic benefits through lower transaction costs and by improving marketing information. This in turn reduces uncertainty and leads to market growth (Bedi, 1999; Norton, 1992; Leff, 1984). Telecom also generates indirect benefits by accelerating the diffusion of information. Telecom infrastructures facilitate the acquisition and transfer of information in the most cost effective

⁹ Studies that find no or negative relationship between productivity growth and IT investment – Loveman, 1994; Morrison and Berndt, 1990; Siegel and Griliches, 1991 – were mainly based on data and IT investments in the 1970s and 1980s. On the other hand, those that do report some positive contribution – Brynjolfsson and Hitt, 1996; Lal, 1996 – use data from the late 1980s and 1990s (see Bedi, 1999 for further descriptions and references).

and time efficient manner and at the same time minimize the obstacles or barriers that are due to distance (Nadiri and Nandi, 2003; Madden and Savage, 2000).

Madden and Savage (2000) analysed the impact of telecoms on transaction costs and related this impact to economic welfare. They showed that when transaction costs are high output from businesses is generally low and that the absence of surpluses that would have accrued to consumers and producers if output had been higher results in welfare losses (also see Greenstein and Spiller, 1996). High transaction costs also threaten the viability of markets when consumers can no longer pay the price that producers must charged to recover them. Telecom investment plays a role in reducing transaction costs by enabling efficient communication between trading partners along the length of the (business) supply chain. Efficient communication improves the responsiveness of businesses to their markets thus improving their ability to compete more effectively in their local markets, and against increasing foreign competitors in export markets (Analysys, 2000).

These benefits of telecom infrastructure are however dependent on the existence of other complementary physical infrastructure - for example transportation (as represented in Figure 5). A study by Lesser and Osberg (cited in Pierce and Jéquier, 1983) hypothesized that minimum threshold levels exist for each of such infrastructure and which must be attained before benefits can be enjoyed. So a nation that, for example, develops its telecom infrastructure whilst leaving its transportation network at a low level of development can expect minimal, or zero impact on growth.

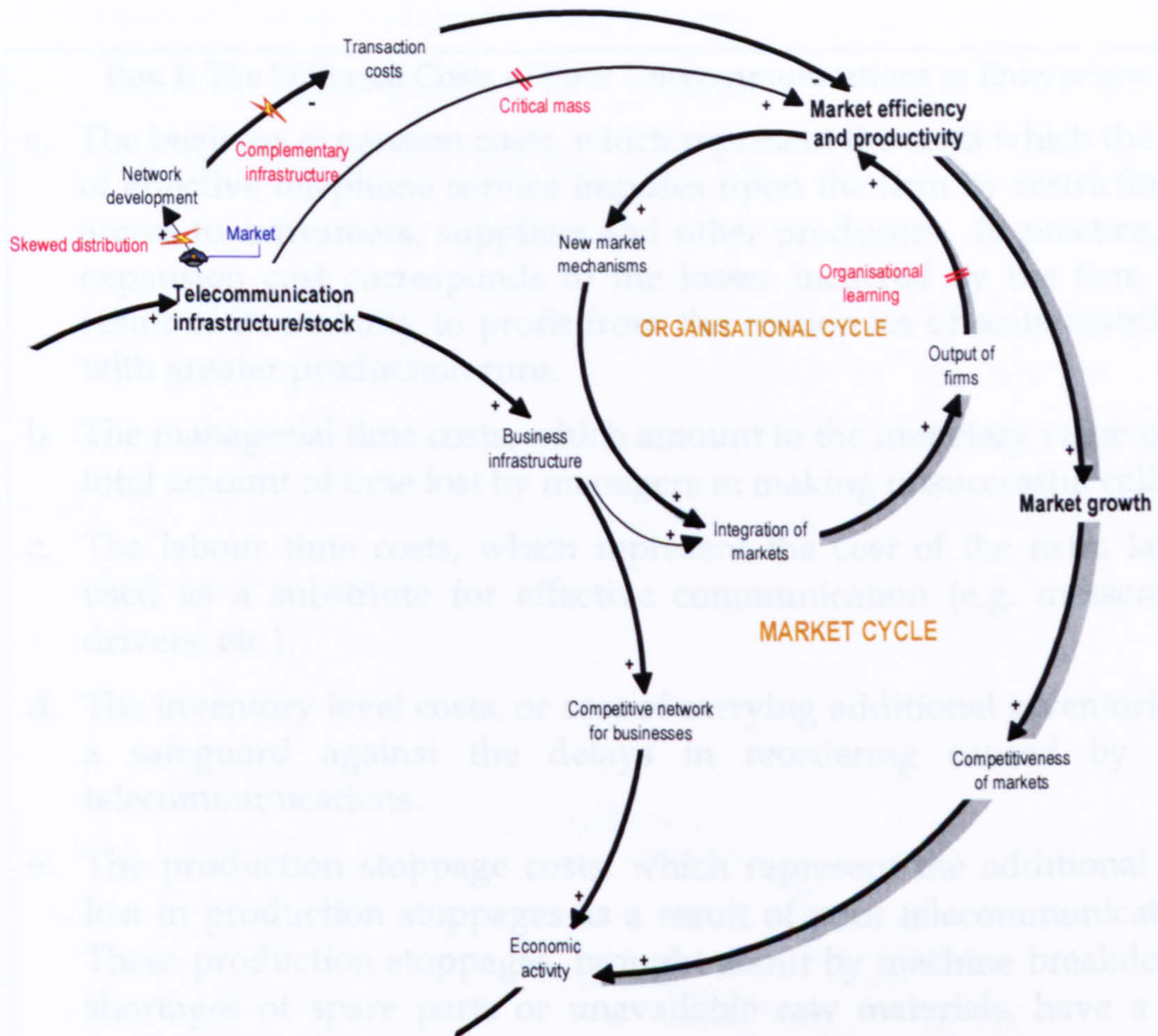


Figure 5: Sub-section of Influence Diagram: The Market Cycle - Transaction Costs and Complementary infrastructure

Another study, and one that focuses on the same population as the focus of this thesis - micro-entrepreneurs in a developing country context, is that conducted by Tyler and Jonscher (1982) of a group of Kenyan enterprises. This study examined the impact of telecommunications on the costs of doing business and analysed the benefits of telecommunications from the perspective of the costs poor telecoms had on these businesses. Telecom was found to contribute to the lowering of costs associated with: business expansion, managerial time, halts in production etc. Box 1 lists out the costs identified by the study.

Source: Pierce, W. and Joplin, N. (1983) "Telecommunications for Development" p. 28

Box 1: The Different Costs of Poor Telecommunications in Enterprises

- a. The business expansion costs, which represent the costs which the lack of effective telephone service imposes upon the firm by restricting its access to consumers, suppliers and other producers. In practice, this expansion cost corresponds to the losses incurred by the firm as a result of its inability to profit from the economies of scale associated with greater production runs.
- b. The managerial time costs, which amount to the monetary value of the total amount of time lost by managers in making unsuccessful calls.
- c. The labour time costs, which represent the cost of the extra labour used as a substitute for effective communication (e.g. messengers, drivers, etc.).
- d. The inventory level costs, or cost of carrying additional inventories as a safeguard against the delays in reordering caused by poor telecommunications.
- e. The production stoppage costs, which represent the additional time lost in production stoppages as a result of poor telecommunications. These production stoppages, brought about by machine breakdowns, shortages of spare parts or unavailable raw materials, have a very high marginal cost in the short run: they lead to dramatic falls in revenue, but to very little offsetting savings in fixed costs.
- f. The vehicle fleet scheduling costs resulting from the underutilization of vehicles and the higher mileage due to the difficulty of organizing "back-loads".
- g. The purchasing decision costs, or costs resulting from the inability to contact a sufficiently large number of suppliers, so as to obtain the lowest price for raw materials, equipment or services.
- h. The selling price costs, which represent the reverse of the purchasing decision costs: the larger the number of potential customers which can be effectively contacted, the greater the possibility of selling the firm's product at a higher price (this factor appears particularly important in the case of exports of highly perishable agricultural products).
- i. The supply costs which represent the costs incurred by the firm as a result of its inability, caused by poor telecommunications, to offer on the market its total available supply of goods or services (as in the case of the vacant rooms of a tourist hotel).

Source: Pierce, W. and Jéquier, N. (1983) "Telecommunications for Development" p. 58

4.3 Market Cycle: Telecom's impact on information costs:

The availability and quality of information is critical to business responsiveness, and so too are the costs associated with acquiring this information (see Figure 6). Investment in, and implementation of, modern telecom infrastructure ultimately reduces the cost of acquiring information and improves its availability. As mentioned in the section above, telecommunications boosts investments in the economy by reducing market uncertainty. It also expands the geographic scope of search for buyers and reach of sellers (Frieden, 2000).

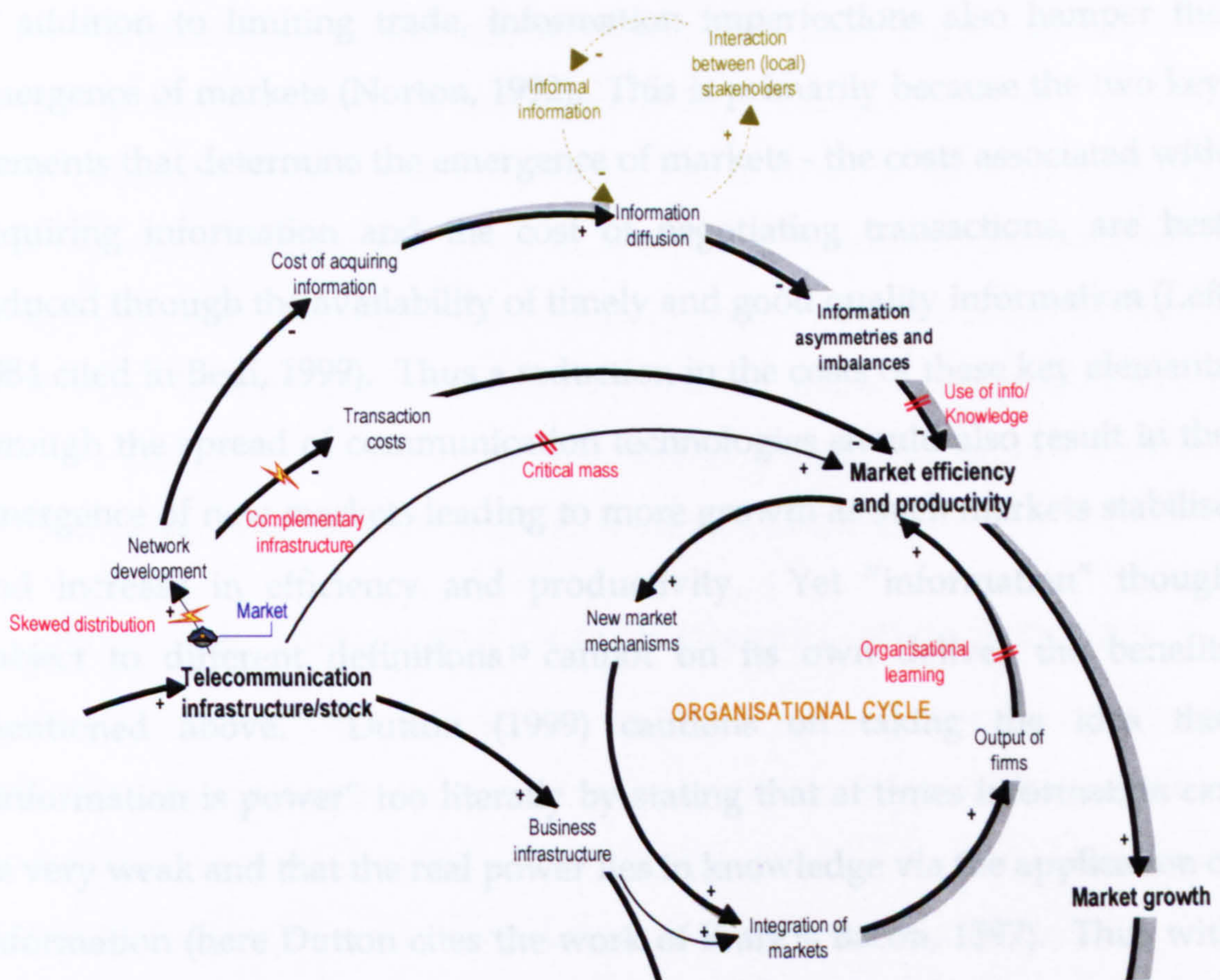


Figure 6: Sub-section of Influence Diagram: The Market Cycle -Information Costs

Stiglitz's (1988) investigation of the causes and consequences of transaction costs, uncertainty, incomplete markets and incomplete information in developing countries revealed that inadequate communication facilities and high transmission costs lead to reductions in the use of existing information and inhibit the production of new information. Reductions in the cost of

acquiring and transmitting information not only result in an increase in the diffusion of information, but also create an impetus for growth in the supply of information (for example through the interaction of local stakeholders acting as information producers). This new source/supply of information in turn results in reductions in prevalence of informal information and, provided that the cost of acquiring these new sources of information is low, will result in further increases in the diffusion of information and reductions in information imbalances and uncertainty (Bedi, 1999).

In addition to limiting trade, information imperfections also hamper the emergence of markets (Norton, 1992). This is primarily because the two key elements that determine the emergence of markets - the costs associated with acquiring information and the cost of negotiating transactions, are best reduced through the availability of timely and good quality information (Leff, 1984 cited in Bedi, 1999). Thus a reduction in the costs of these key elements through the spread of communication technologies should also result in the emergence of new markets leading to more growth as such markets stabilise and increase in efficiency and productivity. Yet "information" though subject to different definitions¹⁰ cannot on its own deliver the benefits mentioned above. Dutton (1999) cautions on taking the idea that "information is power" too literally by stating that at times information can be very weak and that the real power lies in knowledge via the application of information (here Dutton cites the work of Francis Bacon, 1597). Thus with reference to the influence diagram (see Figure 6), whilst reductions in information asymmetries and imbalances are necessary for increases in market efficiency and productivity, their impact depends on existing availability of knowledge that can identify the value and use of the newly available information.

¹⁰ Losee (1997) provides a "discipline independent definition of information" and describes it as the output of a process.

4.4 Telecom's impact on energy and transportation

Transportation is the world's fastest-growing form of energy use, accounting for nearly 30 percent of world energy use and 95 percent of global oil consumption (Worldwatch Institute, 2004)¹¹. In 2002 transportation accounted for approximately 30 per cent of total energy consumed in developing countries, and road transportation accounts for a significant share of this (EIA, 2004). The potential benefits of telecoms to a more efficient transportation system are based on the logic that if people use the telephone to communicate, instead of going physically from one place to the other, transportation needs will decrease (or at least remain stable) and energy consumption will in consequence be reduced (Pierce and Jéquier, 1983). The role of telecoms in reducing travel needs is however complex; whilst it can substitute for travel in specific, well-defined circumstances¹² there are other purposes (professional and personal) that are achieved during these trips. Telecom also leads to an increase in communication and this can lead to more trade opportunities. Increase in communication can therefore indirectly lead to an increase in the total amount of travel.

5 Economic, Market and Organisational Cycles: Summary

To summarise and with reference to the influence map (see Figure 7), the reduction of information and transaction costs raises the profitable output of businesses and thus contributes to "market growth" in two main ways. Firstly, by helping to reduce transaction costs telecoms makes markets more efficient. Lower transaction costs also increase the overlap in geographically similar and neighbouring markets resulting in intensified competition and hence higher economic activity.

¹¹ <http://www.worldwatch.org/press/news/2004/01/07/> accessed 14 October 2005

¹² For example routine communications with well-known partners, as opposed to complex negotiations with yet unknown people (Pierce and Jéquier, 1983)

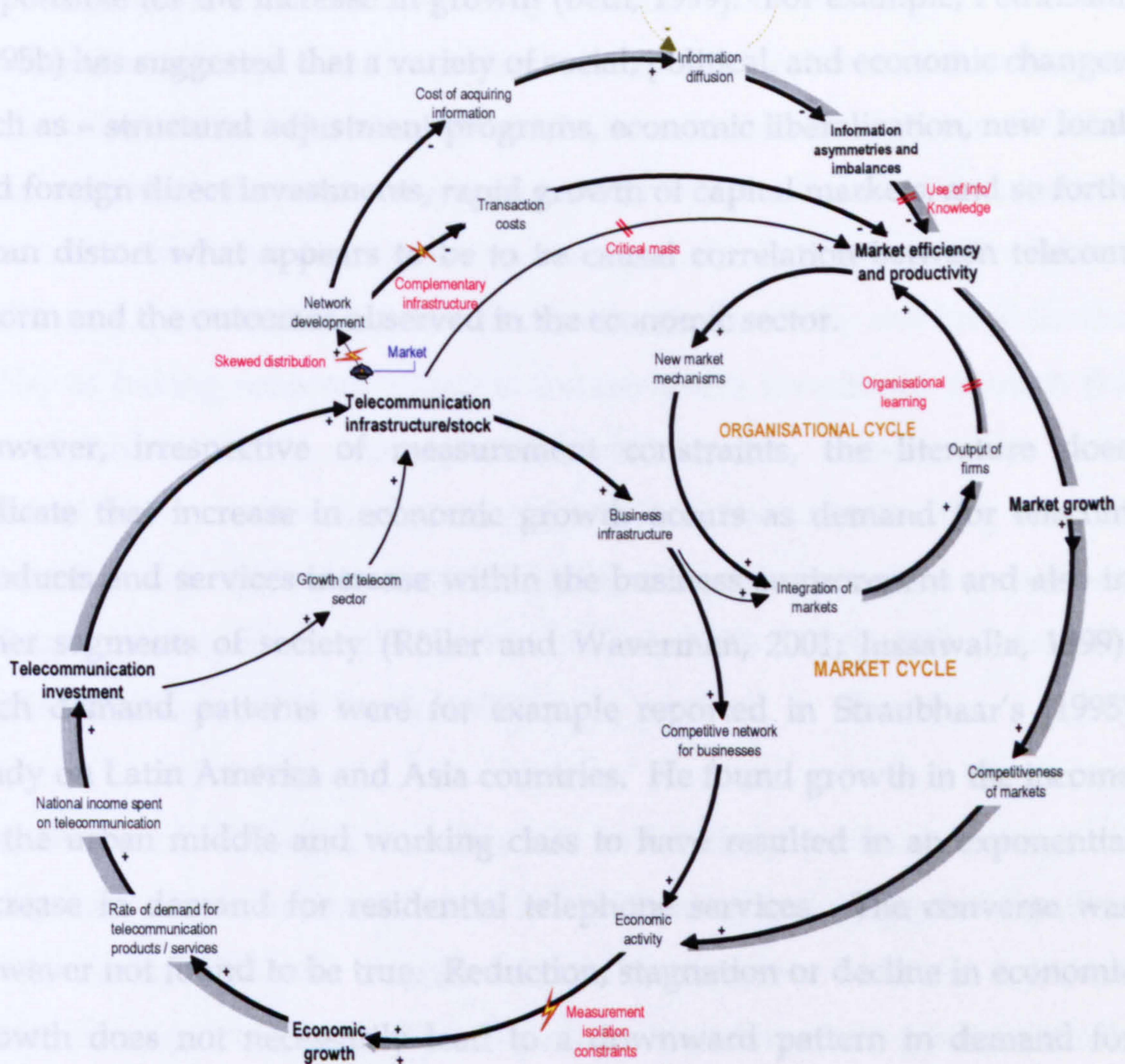


Figure 7: Sub-section of Influence Diagram: Intersection between Market and Economic Cycles

Secondly output will increase as information inputs become cheaper, particularly in information-intensive industries (Welfens, 1995). It is therefore not surprising that Greenstein and Spiller (1995) and Cronin et al. (1993, 1997) found that the greatest impact of telecom infrastructure is first experienced by telecom-related industries –such as finance, wholesale trade, tourism, transportation, and import and export sectors.

Increases in economic activity are said to result in increased economic growth, though there are also constraining effects such as the inability to

verify (with appropriate measurements) that telecommunication is indeed responsible for the increase in growth (Bedi, 1999). For example, Petrazzini (1995b) has suggested that a variety of social, political, and economic changes such as – structural adjustment programs, economic liberalization, new local and foreign direct investments, rapid growth of capital markets, and so forth – can distort what appears to be to be causal correlation between telecom reform and the outcomes observed in the economic sector.

However, irrespective of measurement constraints, the literature does indicate that increase in economic growth occurs as demand for telecom products and services increase within the business environment and also in other segments of society (Röller and Waverman, 2001; Jussawalla, 1999). Such demand patterns were for example reported in Straubhaar's (1995) study on Latin America and Asia countries. He found growth in the income of the urban middle and working class to have resulted in an exponential increase in demand for residential telephone services. The converse was however not found to be true. Reduction, stagnation or decline in economic growth does not necessarily lead to a downward pattern in demand for telecom products and services. Rather, this rate of demand appeared to be influenced by the strength (and direction) of economic growth – Straubhaar found that the rate of telecoms investment and growth decreased during periods of economic stagnation and decline.

It can therefore be assumed that the supply of telecom products and services will aspire to match increases in demand and this will in turn fuel boost the percentage of the national income that is spent on telecommunications¹³. Such increases will in turn lead to increases in telecommunications

¹³ This is illustrated by the growth patterns of telecom performance indicators published by the International Telecommunications Union (ITU) and available in their World Telecommunication Indicators Database; for example Annual Investment in Telecommunications and Investment in Telecommunications as a percentage of GDP.

infrastructure and the “Economic Cycle” depicted in the influence map (see Figure 2) repeats itself. In developing countries where the main or primary telecom infrastructure is under government ownership, there are few success stories when it comes to investments in infrastructure and in cases where some measure of success has been achieved much has depended on continuous and robust national economic growth. For example Straubhaar (1995) cites a number of East Asian countries (in the 1980s) and Brazil (in the 1970s) as having achieved telecoms infrastructure investment through the use of internal funds, cross-subsidies, and bonds. However the more common case is for developing countries to fund investments using external debt and equity rather than internal funds, and getting access to such forms of finance comes with conditions (World Bank, 2005; Collins, 2000; Petrazzini, 1995b; Straubhaar, 1995; Bande, 1995).

The “Economic Cycle” is therefore not an infinitely positively reinforcing cycle; there are a number of factors that militate against its reinforcing effect and/or delay whatever impact telecom investments have on economic performance (see Figure 8). This is perhaps best shown using investment in developing countries as an example. Again in circumstances where governments control the telecom network, development of the network competes with other physical infrastructure for finite resources or income. The opportunity costs of investing in telecoms rather than other basic infrastructure therefore needs to be carefully considered so as to minimise the occurrence of “development opportunity costs”. Such costs arise when investments in telecom are made at the expense of more pressing development initiatives such as provision of environmental sustainability, healthcare, education etc. However, delay or reduction in investment in telecoms has a direct impact on the stock of telecom infrastructure available to the country’s population and thus available to promote economic activity.

electricity supply etc. For example, Dabla (2004) shows that the coordination of information technology policies and other interventions (from government or non-governmental bodies) highly influence the achievement of information technology related goals. Also, the use to which the technology is put and its availability are fundamental to understanding how it promotes development. This review of the literature starts with how accessible the technology is to the population and the impact pattern of accessibility on development.

6.1 Accessibility Cycle

The availability of telecommunication services and the way in which they are used are key mechanisms through which it influences socio-economic development (Beebe and Gilpin, 1999). Furthermore, the use of telecommunication networks as “non-rival” inputs (Beebe and Gilpin, 1999) – i.e. the use of the network or service by one person does not prevent its possible use by anyone else. Also, an increase in network use generates network externalities – the phenomenon by which more users benefit from any cost savings passed on by service providers as well as from the indirect benefits of mobility within an

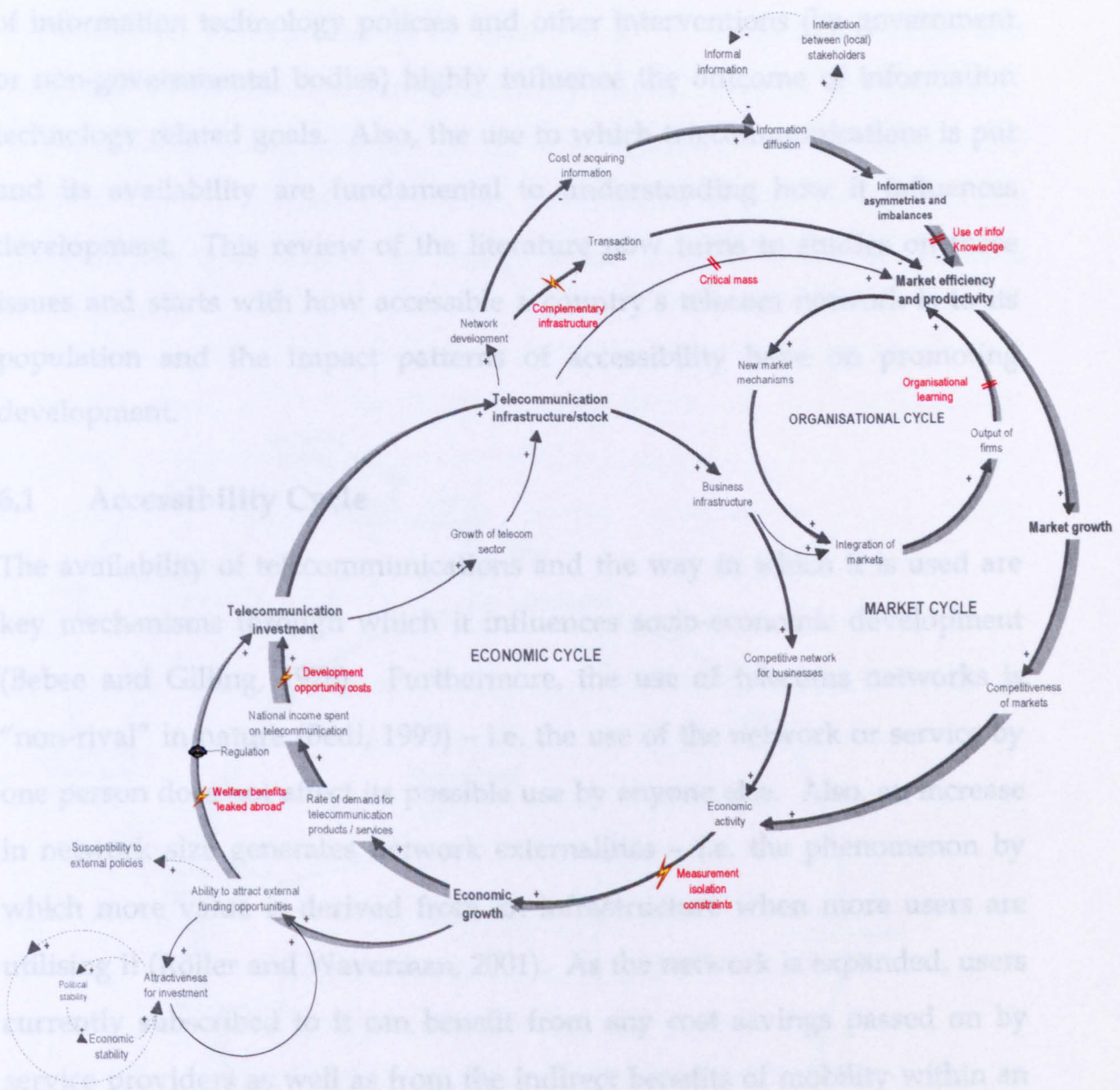


Figure 8: Sub-section of Influence Diagram: Constraining and delay effects on Economic, Market and Organisational Cycles

6 Other Cycles of the Causal Map

So far this review of the impact of telecommunications on development has been economic in outlook. Furthermore, due to the sample of literature it has drawn upon, the discussion has been technocratic and the interpretation of results predominantly positive. However, the link between telecoms and economic growth is also dependent on environmental factors such as policy, the state of supporting infrastructure – like transport networks, and

electricity supply etc. For example, Dabla (2004) shows that the coordination of information technology policies and other interventions (by government or non-governmental bodies) highly influence the outcome of information technology related goals. Also, the use to which telecommunications is put and its availability are fundamental to understanding how it influences development. This review of the literature now turns to studies on these issues and starts with how accessible a country's telecom network is to its population and the impact patterns of accessibility have on promoting development.

6.1 Accessibility Cycle

The availability of telecommunications and the way in which it is used are key mechanisms through which it influences socio-economic development (Bebee and Gilling, 1976). Furthermore, the use of telecoms networks is "non-rival" in nature (Bedi, 1999) - i.e. the use of the network or service by one person does not affect its possible use by anyone else. Also, an increase in network size generates network externalities - i.e. the phenomenon by which more value is derived from an infrastructure when more users are utilising it (Röller and Waverman, 2001). As the network is expanded, users currently subscribed to it can benefit from any cost savings passed on by service providers as well as from the indirect benefits of mobility within an increasing geographical coverage. Government and societal benefits accrue from having a pervasive infrastructure through which information can be distributed. The telecom operator enjoys decreasing cost of service provision per user and increasing profits from growth in numbers of users and usage. Investors also obtain returns on their investments. The expansion of the telecoms network should therefore ideally be a key objective of most stakeholders.

As shown in the figure below, research has however shown that in practice, expansion of telecom networks often result in inequitable social and geographical distributions across a country (Bayes, 1999). A key contributor to this is the economic incentive for network expansion. As discussed earlier (section 3.2), due to limited resources, governments adopt liberalization and privatization mechanisms to bring about desired levels of network development.

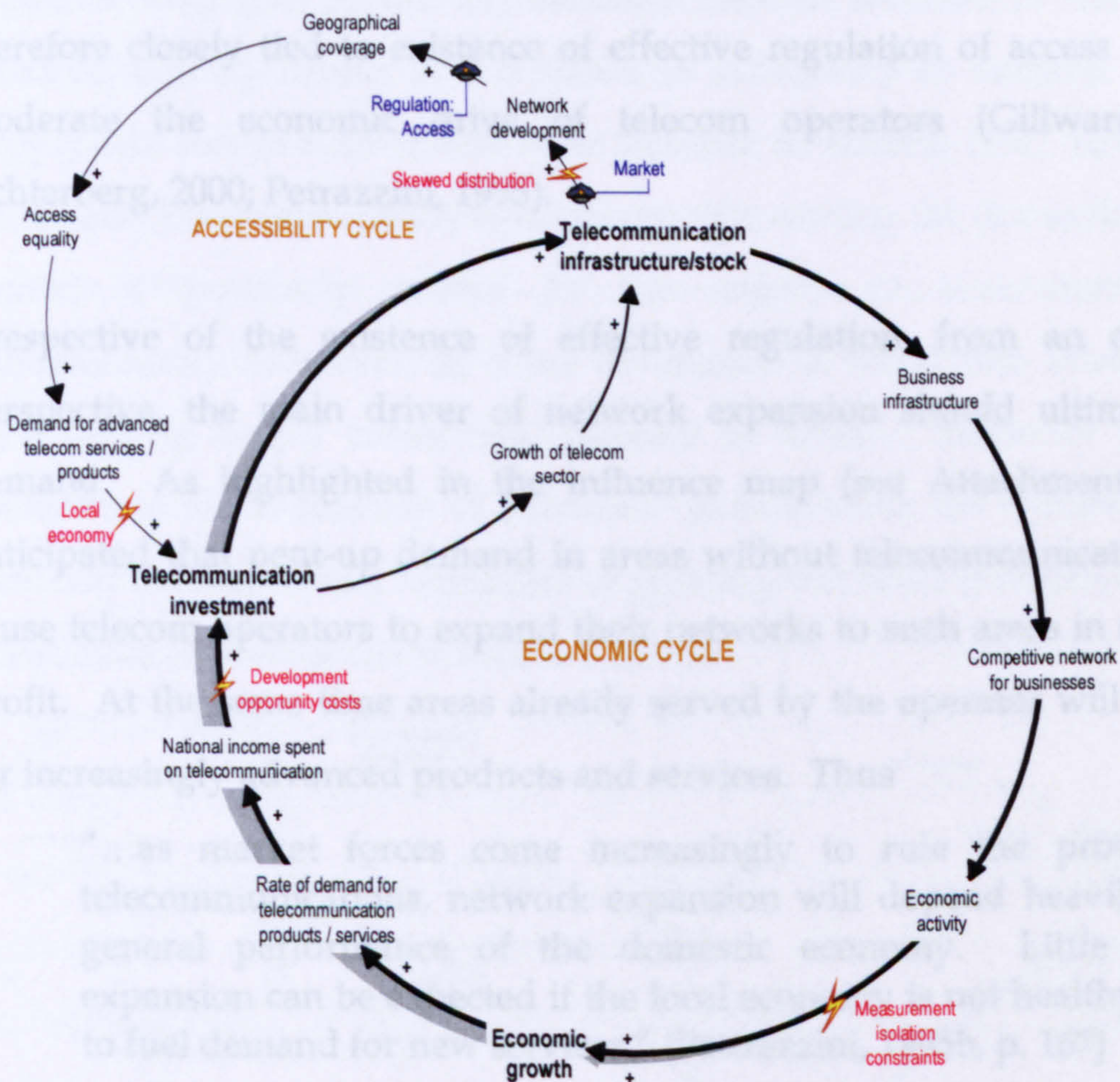


Figure 9: Sub-section of Influence Diagram: Accessibility Cycle

The private operators and privatized or corporatized telecommunication firms that result are profit-maximizers who will seek to consolidate their market position, and establish precedence over future competitors by expanding their operations as much as possible (Petrazzini, 1995).

The more profit-oriented these firms are, the more concentrated network development becomes in the most economically attractive segments of the market, to the detriment of “unprofitable” areas and access equality in general. This skewed network distribution can be vertical - resulting in class based access inequality, or horizontal - leading to regional access inequality, or both. What ever the form it takes, skewed network distribution undermines the potential benefit of telecommunications to the population of a country (Sinha, 1995). The attainment of equitable network distribution is therefore closely tied to existence of effective regulation of access that can moderate the economic drive of telecom operators (Gillward, 2003; Achterberg, 2000; Petrazzini, 1995).

Irrespective of the existence of effective regulation, from an economic perspective, the main driver of network expansion should ultimately be demand. As highlighted in the influence map (see Attachment 1) it is anticipated that pent-up demand in areas without telecommunications will cause telecom operators to expand their networks to such areas in search of profit. At the same time areas already served by the operator will demand for increasingly advanced products and services. Thus

“...as market forces come increasingly to rule the provision of telecommunications, network expansion will depend heavily on the general performance of the domestic economy. Little network expansion can be expected if the local economy is not healthy enough to fuel demand for new services.” (Pettrazzini, 1995b, p. 167)

The characteristics of this demand for services and the factors influencing it are discussed in the following section.

6.2 Demand Cycle

Demand for telecoms is inversely related to price - in general, the more expensive telecom service becomes, the lower will be the demand for it. Empirical support for this observation include Rölller and Waverman's (2001)

observation of a positive relationship between demand for telecom infrastructure and real GDP, and Madden and Savage's (2000) observed negative relationship between the level of economic development (measured as GDP per capita) and relative call cost. These results may be interpreted as meaning that demand for telecom services is higher in countries with high levels of economic development. Furthermore, the cost of telephone calls also tends to be lower in such countries and it can be concluded that low cost of calls is in turn associated with increase in demand for telecoms. The influence map (see Figure 10) indicates that an increase in demand for telecoms initially results in a decrease in availability as demand outstrips supply and this in turn results in an increase in waiting lists. Empirically, Röller and Waverman (2001) have shown that waiting list (for mainlines per capita) is positively related to the supply of telecommunications infrastructure. However, as more investment is made into infrastructure (and barring supply constraints) increase in demand indirectly results in increases in the availability of telecoms. In their study the relationship was however not statistically significant suggesting that some (perhaps technical) constraints limit response to excess demand.

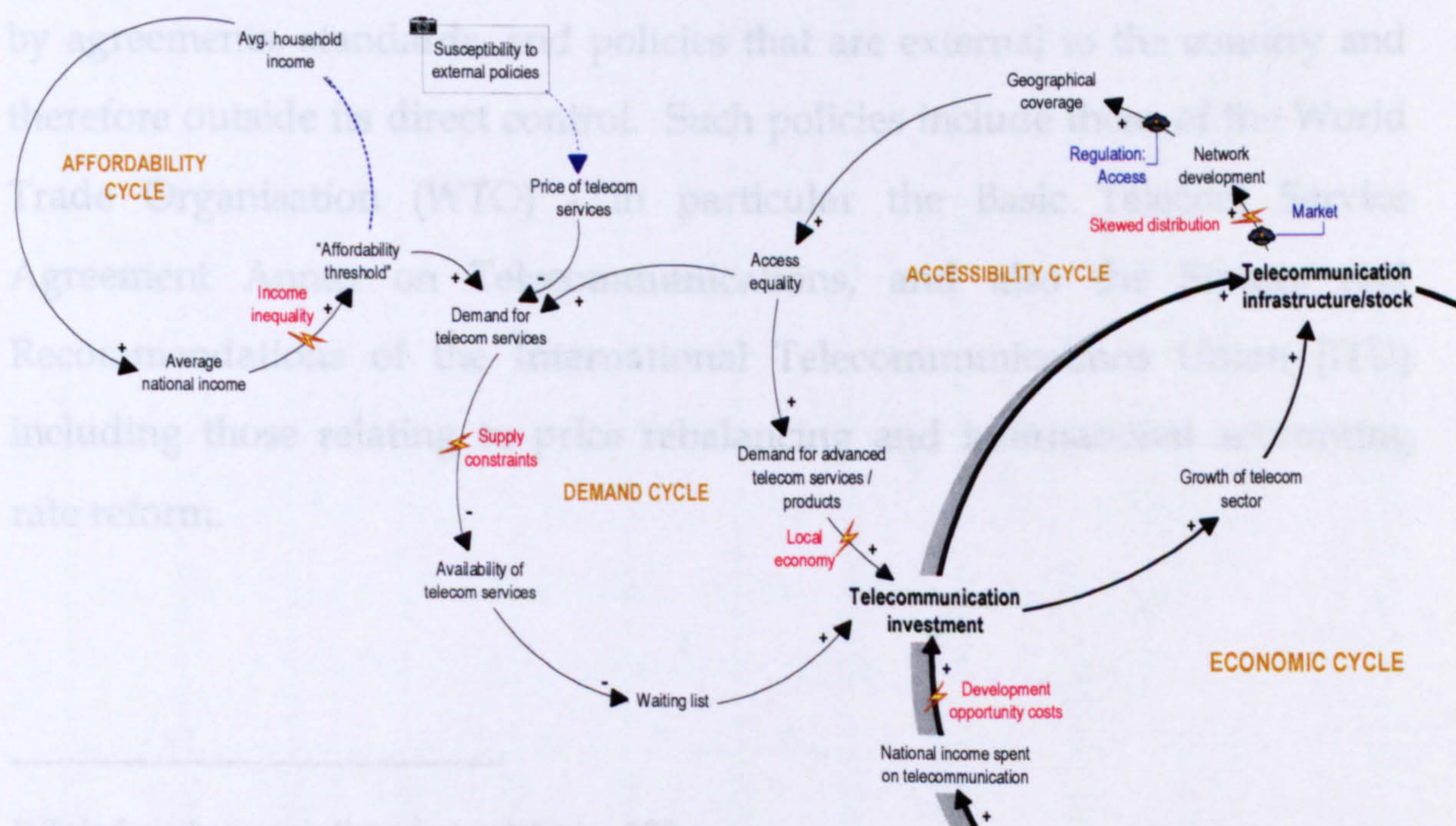


Figure 10: Sub-section of Influence Diagram: Demand and Affordability Cycles

6.3 Affordability Cycle

Access to telecommunications also depends on its affordability to low-income customers (Souter, 1999). A frequently used measure of the level of telecommunications development in a country is its penetration rate, also known as teledensity. It is measured as the total number of telephone subscribers divided by the total population of the country and multiplied by 100 so as to express the figure per 100 persons¹⁴. The more affordable telecom is, the greater is the level of teledensity observed as illustrated in Figure 11 ¹⁵ (chart data based on 2003 figures in the ITU World Telecommunications Indicators database). Considering that the cost of telephones, computers and fax is between five to ten times higher in developing countries than in the developed economies (Morales-Gómez and Melesse, 1998), it is not surprising that most developing countries have less affordable telephony and thus lower teledensities.

The price of telecom access is more than just the cost of getting connected (connection charges). It also includes the cost of making calls. This cost is determined by the business environment of the country but is also influenced by agreements, standards, and policies that are external to the country and therefore outside its direct control. Such policies include those of the World Trade Organisation (WTO) - in particular the Basic Telecom Service Agreement Annex on Telecommunications, and also the Statues and Recommendations of the International Telecommunications Union (ITU) including those relating to price rebalancing and international accounting rate reform.

¹⁴ Teledensity = mainlines/population x 100

¹⁵ Affordability is measured as residential telephone connection charge divided by GDP per capita. Please refer to Appendix 1 for table showing data values.

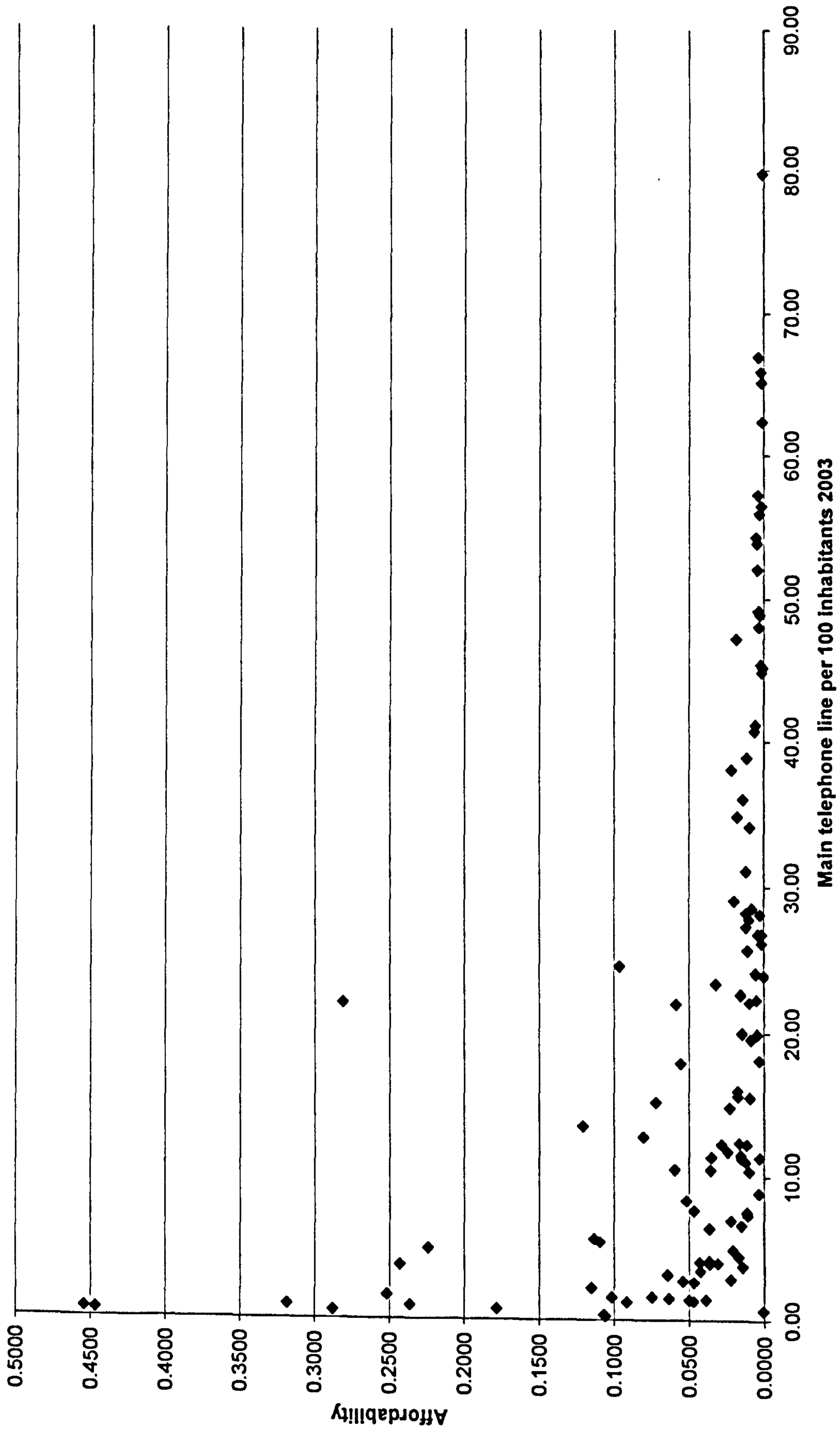


Figure 11: Affordability versus Teledensity

Access to new technology is also a function of the existing education, income, and wealth distribution of a country's population and telecommunications is no different (Bedi, 1999). The relationship between teledensity and national income is influenced by the distribution of income within the population of the country. According to Milne (2000), countries with low levels of GDP per capita¹⁶ achieve higher household telephone penetration when income inequality is high; whilst countries with higher levels of GDP per capita, achieve higher household penetration when income inequality is low. This echoes Pierce and Jequier (1983) who found that among industrialised countries, it is those with the least egalitarian pattern of income distribution that also have the lowest rate of investment in telecommunications relative to their wealth.

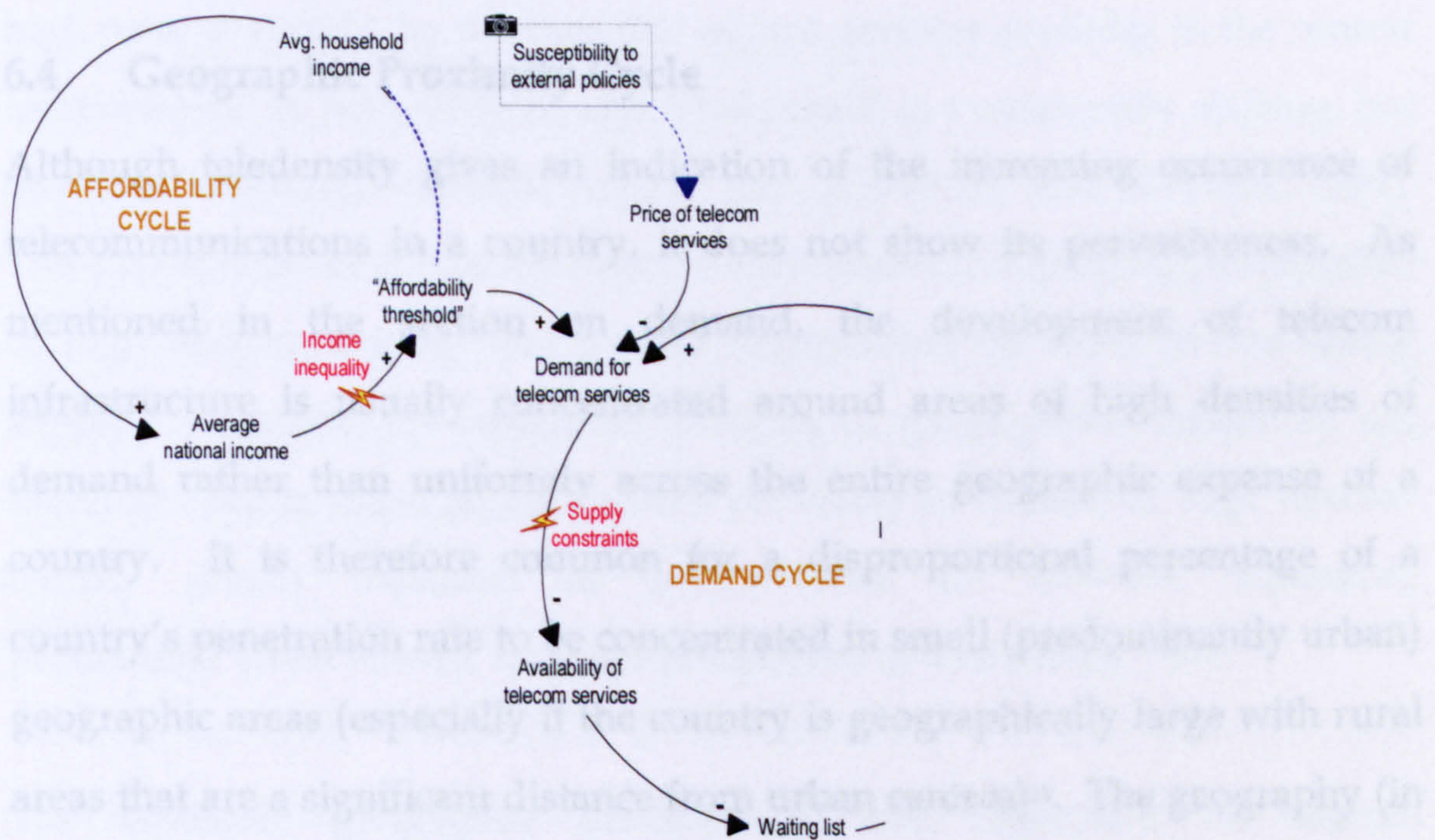


Figure 12: Sub-section of Influence Diagram: Affordability Cycle

With reference to the influence map (Figure 12), assuming that there is a certain percentage of household income that a new subscriber finds acceptable to devote to telecom access (defined in the influence map as

¹⁶ Defined in the Milne's study as below USD2,000

“affordability threshold”¹⁷), then those whose thresholds exceed the cost of telecom access will demand for the service. If in a more equal society, telecommunications is priced high relative to average income, fewer people will be rich enough to afford it. However, as average income rises, telecoms will be affordable to more of population and penetration rates will also rise. In less equal societies, the upper and middle-class customer segments are connected early whilst the poor, unable to afford the service, opt for (formal and informal) community telecom arrangements (Milne, 2000). In such cases, it is often supply constraints (such as funding and technical constraints, corruption, accessibility to demand areas etc.) rather than low household incomes that limit the rate of take-up of residential telephony (Bartels and Islam, 2002; Salomon, 1987).

6.4 Geographic Proximity Cycle

Although teledensity gives an indication of the increasing occurrence of telecommunications in a country, it does not show its pervasiveness. As mentioned in the section on demand, the development of telecom infrastructure is usually concentrated around areas of high densities of demand rather than uniformly across the entire geographic expanse of a country. It is therefore common for a disproportional percentage of a country’s penetration rate to be concentrated in small (predominantly urban) geographic areas (especially if the country is geographically large with rural areas that are a significant distance from urban centres)¹⁸. The geography (in terms of degree of urbanisation) of a country is therefore a significant determinant of the equality of access to telecommunication. This is because

¹⁷ Milne’s analysis of the cost of a basic telephone basket in Europe puts this value at around 0.4% of purchasing power parity (PPP) per capita.

¹⁸ In 2000, and with respect to main telephone lines only, the Republic of Uganda had an overall teledensity of 0.27. Its largest city (Kampala) accounted for approximately 5.4% of its population and 72.2% of the number of mainlines in the country. Teledensity for the rest of the country was approximately 0.08 telephone subscribers per 100 people, whilst that of Kampala was 3.74 (ITU, 2002).

the larger the country is, the more investment will be required to accomplish a certain level of telecom infrastructure, and the more market-oriented the telecom sector of a country becomes. Telecoms suppliers will therefore be sensitive to the 'geographical pattern of expressed demand'. This is because, profits for a telecommunications supplier are high in areas where large numbers of densely located firms or individuals generate a high level of demand that can be met at relatively low cost (such as in central business districts of most major cities). Such locations therefore tend to experience greater telecommunications competition, more investment, faster upgrades of existing services, and earlier introduction of new services.

Although telecom access will eventually reach areas of low demand and/or high costs of supply, by the time this occurs, services available in the central locations tend to have evolved and what results is a continually shifting, but durable, 'telecommunications supply gap' (Cronford and Gillespie, 1999). This gap in turn reinforces the creation and existence of geographical clusters of high telecom density and quality, surrounded by areas of decreasing supply. Complex, yet structured patterns of geographical inequality are therefore seen to exist, and a region's proximity to clusters of high telecom density greatly enhances its attractiveness for network expansion, particularly when viewed from the perspective of cost (Moss, 1999).

The equitable geographic development and expansion of telecom infrastructure thus requires targeted investments and planning, not only through government mechanisms and incentives to telecom providers, but also by the market. Extending telecom services to underserved areas can generate economic growth in such areas, resulting in local efficiencies and the build up of forward and backward links with more developed regions over time (Bande, 1995). This "effective demand" for telecoms (as illustrated in Figure 13) creates the incentive for technological innovations. Such

innovations reduce barriers to market entry and lead to investment in telecom infrastructure as new players enter the sector (Frieden, 2000).

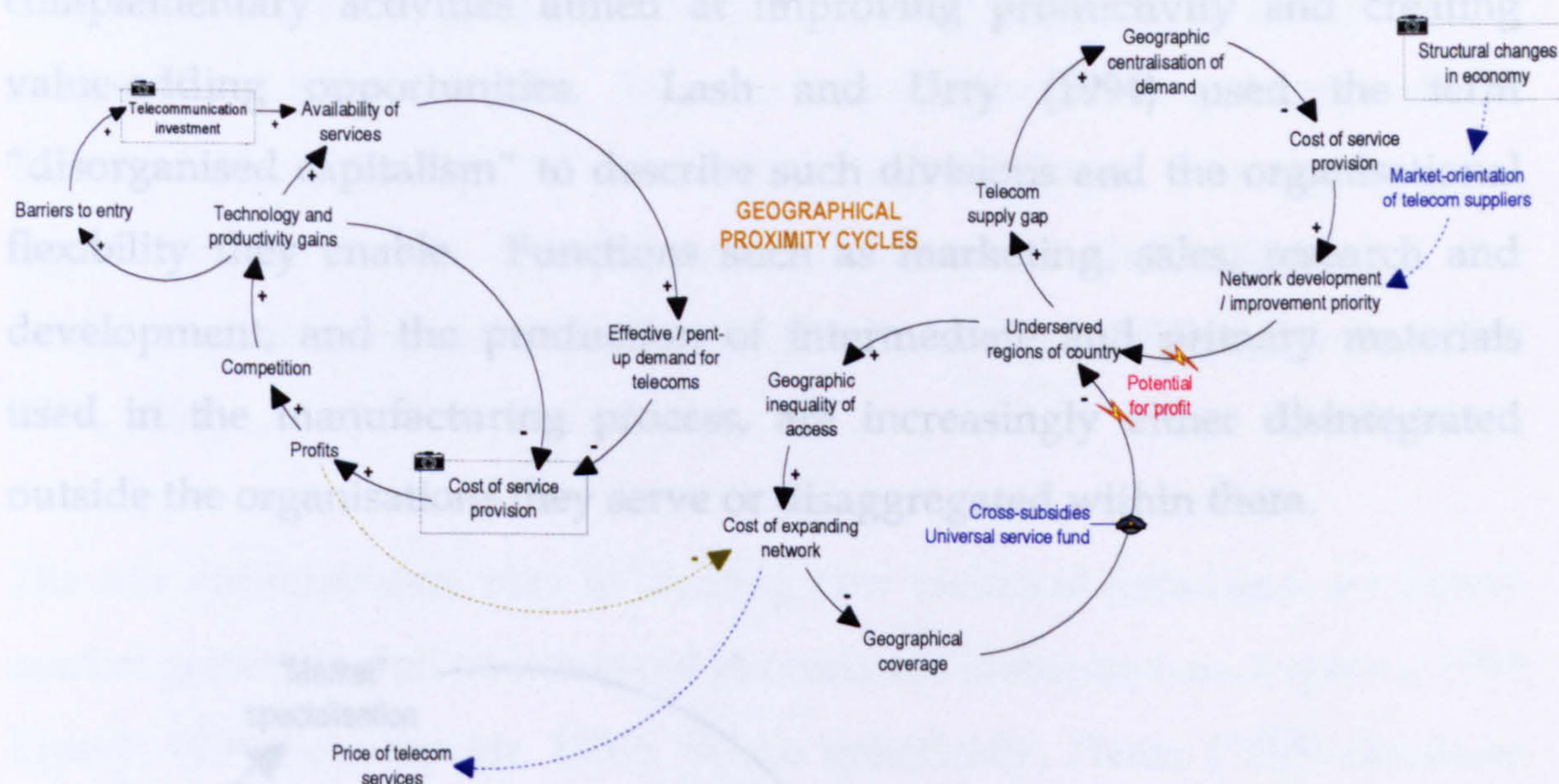


Figure 13: Sub-section of Influence Diagram: Geographical Proximity Cycles

Noll (1999) notes that in addition to competition, the costs associated with providing telecom service are also reduced as a result of continuing technology and productivity gains. However not all of these gains are passed on to the customer and the potential profit to be made makes the market for providing service more attractive - which in turn promotes competition between operators.

6.5 Enterprise Cycles

The ancillary cycles described so far (sections 6.1 to 6.4) discuss the provision of telecom services and the factors that influence this provision. This review of the literature now turns to the factors that influence the manner in which telecom services are used and some of the overriding factors influencing use. The following description of the "Enterprise Cycles" begins at the "Market growth" variable in the influence map (Figure 14).

Market growth leads to labour specialisation that is discernable in the workforce (and labour market as a whole) as functional and spatial divisions

of labour (Smith, 1776 cited in Eliasson, 1994). These divisions result in the creation of new organisational and industry structures that are made up of complementary activities aimed at improving productivity and creating value-adding opportunities. Lash and Urry (1994) used the term “disorganised capitalism” to describe such divisions and the organisational flexibility they enable. Functions such as marketing, sales, research and development, and the production of intermediate and primary materials used in the manufacturing process, are increasingly either disintegrated outside the organisations they serve or disaggregated within them.

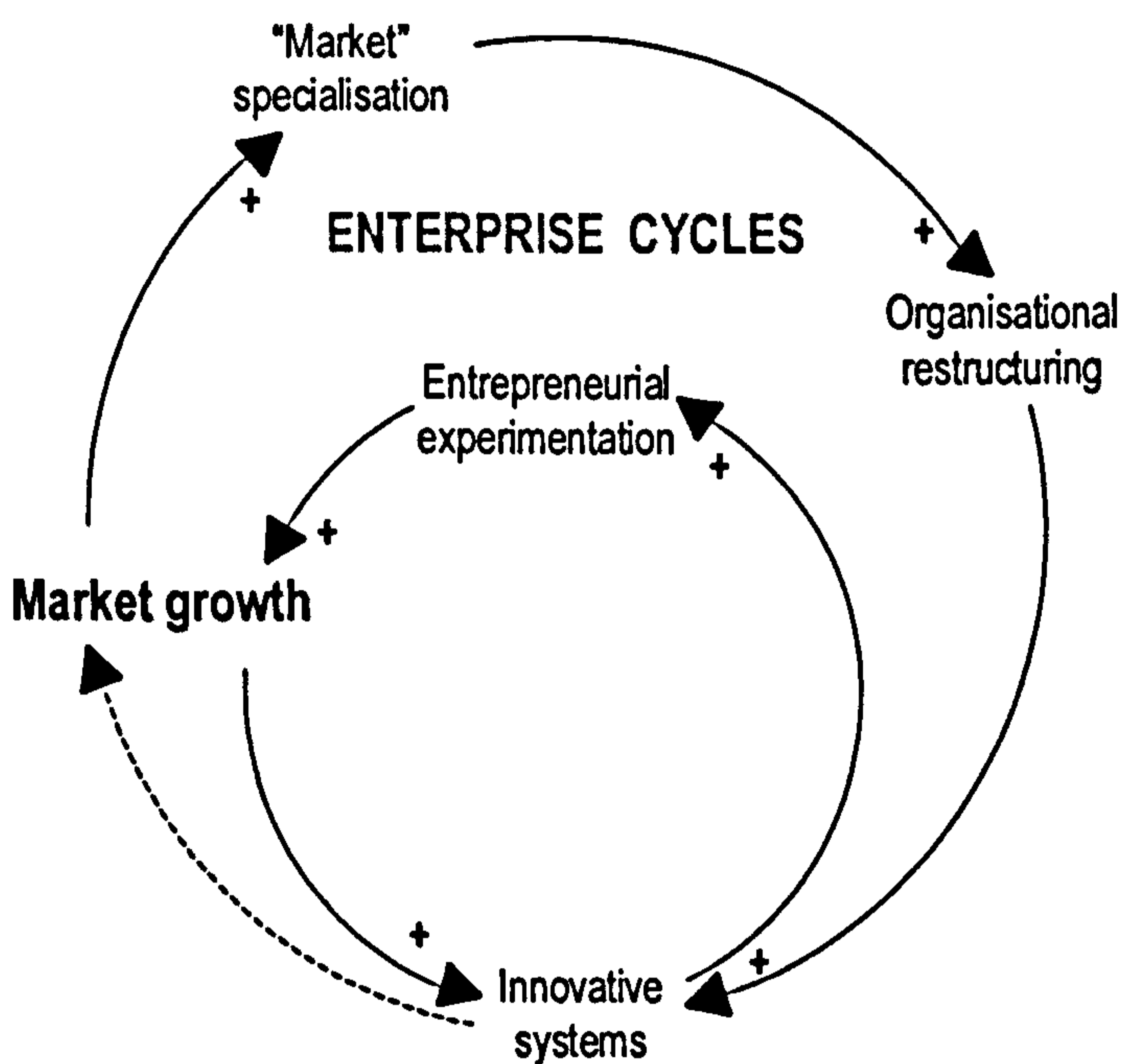


Figure 14: Sub-section of Influence Diagram: Enterprise Cycles

Whether disintegrated outside or disaggregated within the two organisational alternatives create networks of functions that are dependent on integrated communications for effective coordination. According to Henderson and Castells (1987), it is only through an integrated system of telecommunications and computers that simultaneous, integrated and decentralised production, distribution, and management can occur in a dispersed, flexible, interconnected system.

Telecom technologies aid the improvement of productivity by providing the platform for the integration of networks which reduces the occurrence of dysfunctional administration. Telecom technologies also help to expand and improve the quality of services, and enhance “entrepreneurial experimentation” by creating an environment that stimulates the entrepreneurial potential of a country (Carlsson et al., 2002; Avgerou, 1998; DIW, 1984).

The role entrepreneurs play in creating new technical paradigms for future market growth is well documented in economic literature (see Avgerou, 1998; Lipsey, 1994; Schumpeter, 1939). More specifically, Heeks (2005) discusses the importance of medium- and large-scale firms in developing countries, describing them as the main engines of wealth creation and competitiveness and highlighting their ability in making sustainable use of telecommunication technologies. In general, telecommunications, when used to produce tangible, intangible, and information-based outputs, contributes towards economic growth by increasing income, skill and export generation (Dabla, 2004; Madden and Savage, 2000).

6.6 Technological Competence

It is the effectiveness with which organisations utilise technology, rather than the mere presence of the technology itself, that is critical to the economic performance of a country (Mansell, 1999). The level of a country’s technological capability is therefore the basic factor constraining its productivity, and the ability of a country to master and advance technology is central to its economic performance (Nelson and Nelson, 2002).

This technological capability involves much more than the mere transmission of information, rather it encompasses the capacity to use and organise

information to create knowledge that can be translated into products and services that generate growth (see Figure 15). It requires expertise in handling information as well as in the ability to understand the significance of information received.

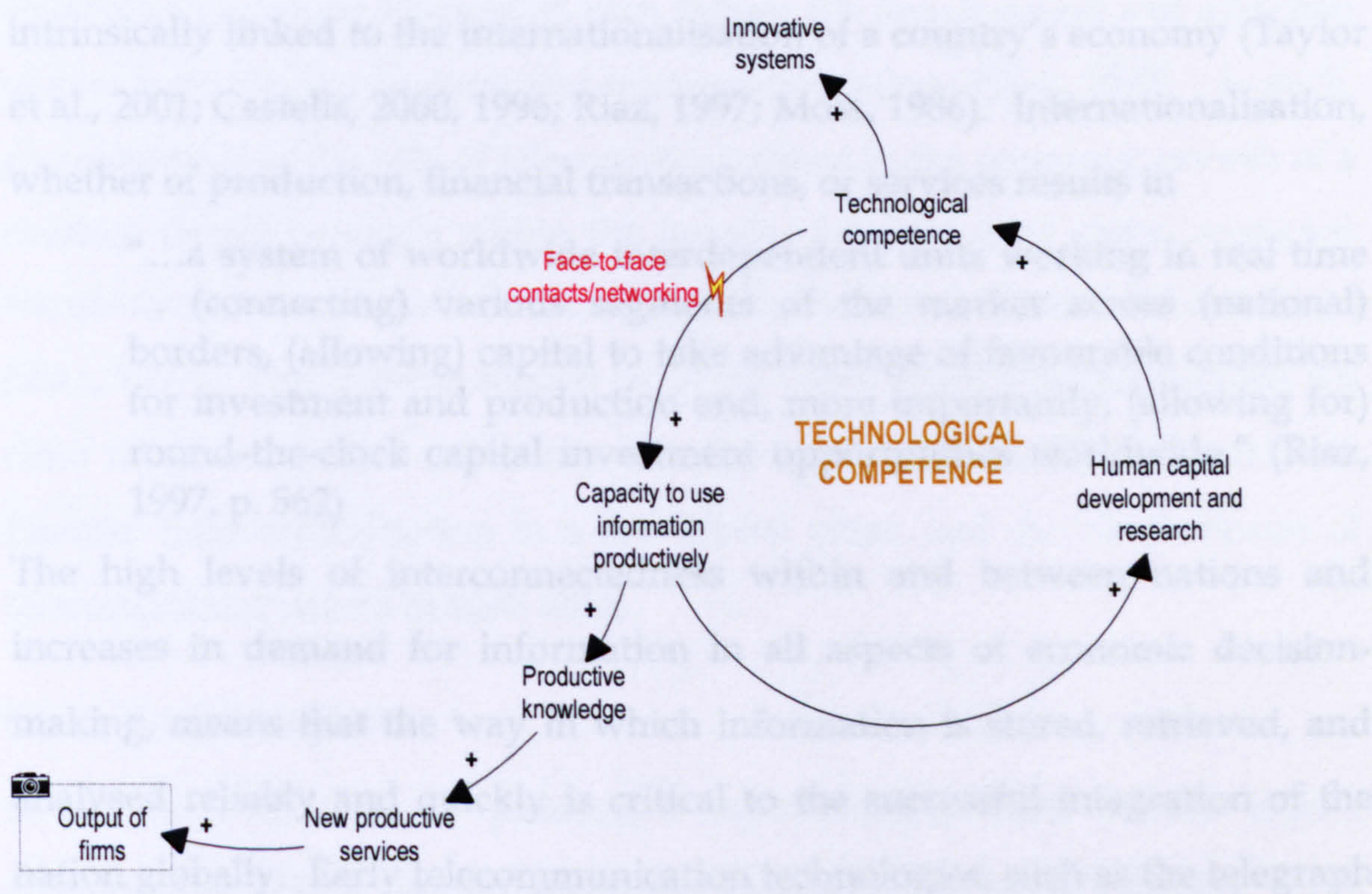


Figure 15: Sub-section of Influence Diagram: Technological Competence Cycle

However, such capacity is unevenly distributed, particularly in information intensive industries where the bulk of knowledge is produced in cities through face-to-face contacts and networking (Taylor et al., 2001). Thus, with respect to the relationship between telecoms and economic development, additional requirements are necessary for telecom to impact positively on growth. This includes the existence of human capital with the pre-requisite skill set to take advantage of the technology, accessibility to information and proximity to centres where knowledge is produced continually through face-to-face contacts and networking, as well as the capacity to use information productively – i.e. in a manner that leads to the creation of knowledge which can be utilised to generate new products and services (Nelson and Nelson, 2002; Dutton, 1999; Mansell and Silverstone, 1996; Freeman and Perez, 1988).

6.7 Internationalisation

Castells (1999) conceptualised the world as a networked society in which 'spaces of flows' are gradually becoming as important as 'spaces of places'. From a global perspective, the expansion of telecom infrastructure is intrinsically linked to the internationalisation of a country's economy (Taylor et al., 2001; Castells, 2000, 1996; Riaz, 1997; Moss, 1986). Internationalisation, whether of production, financial transactions, or services results in

"...a system of worldwide interdependent units working in real time ... (connecting) various segments of the market across (national) borders, (allowing) capital to take advantage of favourable conditions for investment and production and, more importantly, (allowing for) round-the-clock capital investment opportunities worldwide." (Riaz, 1997, p. 562)

The high levels of interconnectedness within and between nations and increases in demand for information in all aspects of economic decision-making, means that the way in which information is stored, retrieved, and analysed reliably and quickly is critical to the successful integration of the nation globally. Early telecommunication technologies, such as the telegraph facilitated this global integration and the growth of more advanced telecom technologies has been a logical extension in addressing this need.

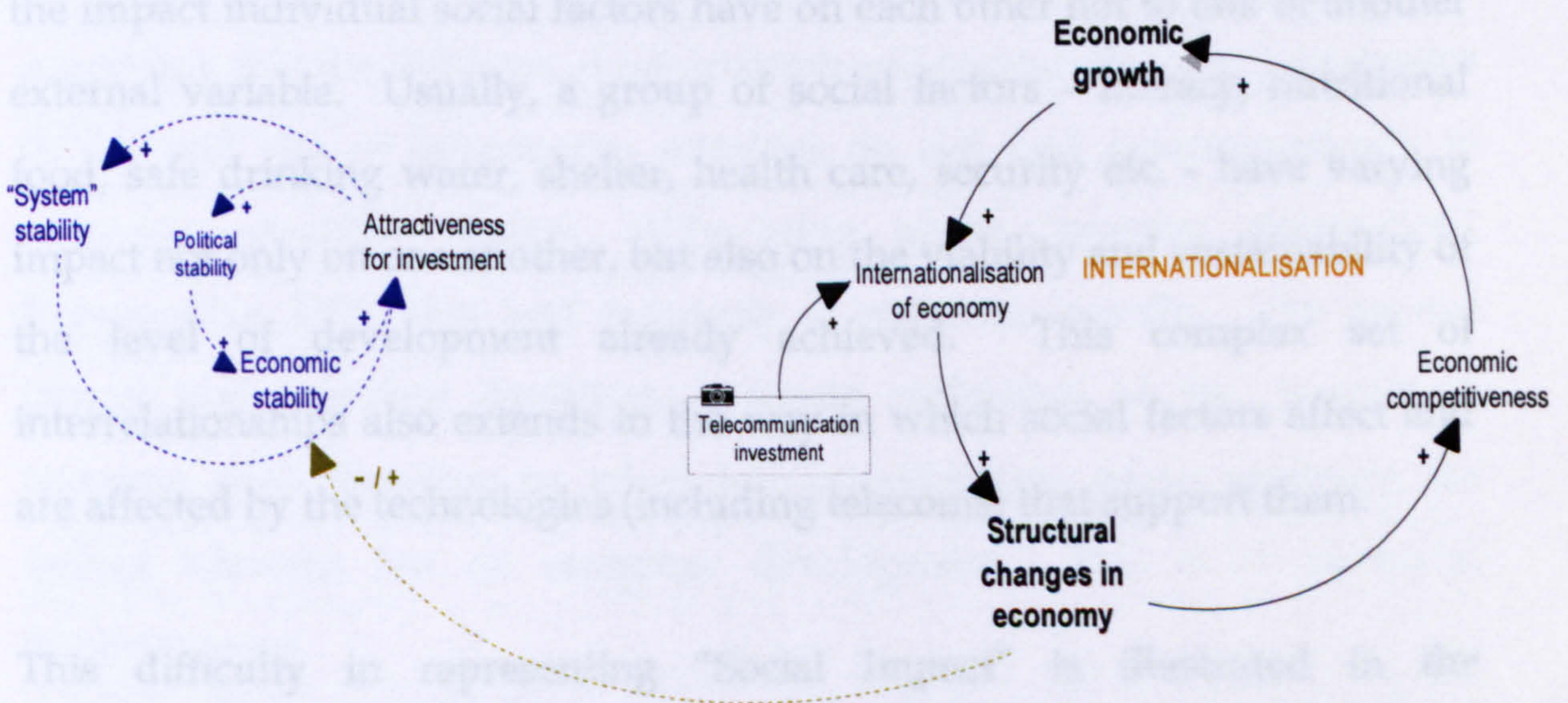


Figure 16: Sub-section of Influence Diagram: Internationalisation Cycle

Telecoms can therefore be either a catalyst or channel through which an economy is internationalised (as highlighted in Figure 16). Internationalisation is in turn a critical component of structural changes in economies and these changes in turn induce the development and adoption of new technologies, in particular telecommunications (Riaz, 1997). As such, an assessment of the role of telecommunications in the economic growth of a country should be made within the broader framework of global economic transformations, and the location of the country within these transformations (Riaz, 1997). This view is echoed by Moss (1999, 1986) who highlighted the close relationship that exists between the internationalisation of trade and finance, their centralisation in a few global cities, and the development of telecom infrastructure in such cities.

6.8 Social Impact

It has been difficult to produce a representative cycle of the impact telecommunications has on social development and of the impact social factors have on the development and/or adoption of telecom technologies. There are numerous reasons for this. For example it is difficult to identify the impact individual social factors have on each other not to talk of another external variable. Usually, a group of social factors – literacy, nutritional food, safe drinking water, shelter, health care, security etc. - have varying impact not only on one another, but also on the viability and sustainability of the level of development already achieved. This complex set of interrelationships also extends to the way in which social factors affect and are affected by the technologies (including telecoms) that support them.

This difficulty in representing “Social Impact” is illustrated in the accompanying influence diagram by depicting the Social Impact cycle as a gold dotted circle. As explained earlier in this chapter (see section 2.1) gold

dotted circles depict logically inferred (rather than empirically established) relationships that have been identified by this thesis as being of secondary (yet relevant) relevance to the variables they are linked to (see Figure 17).

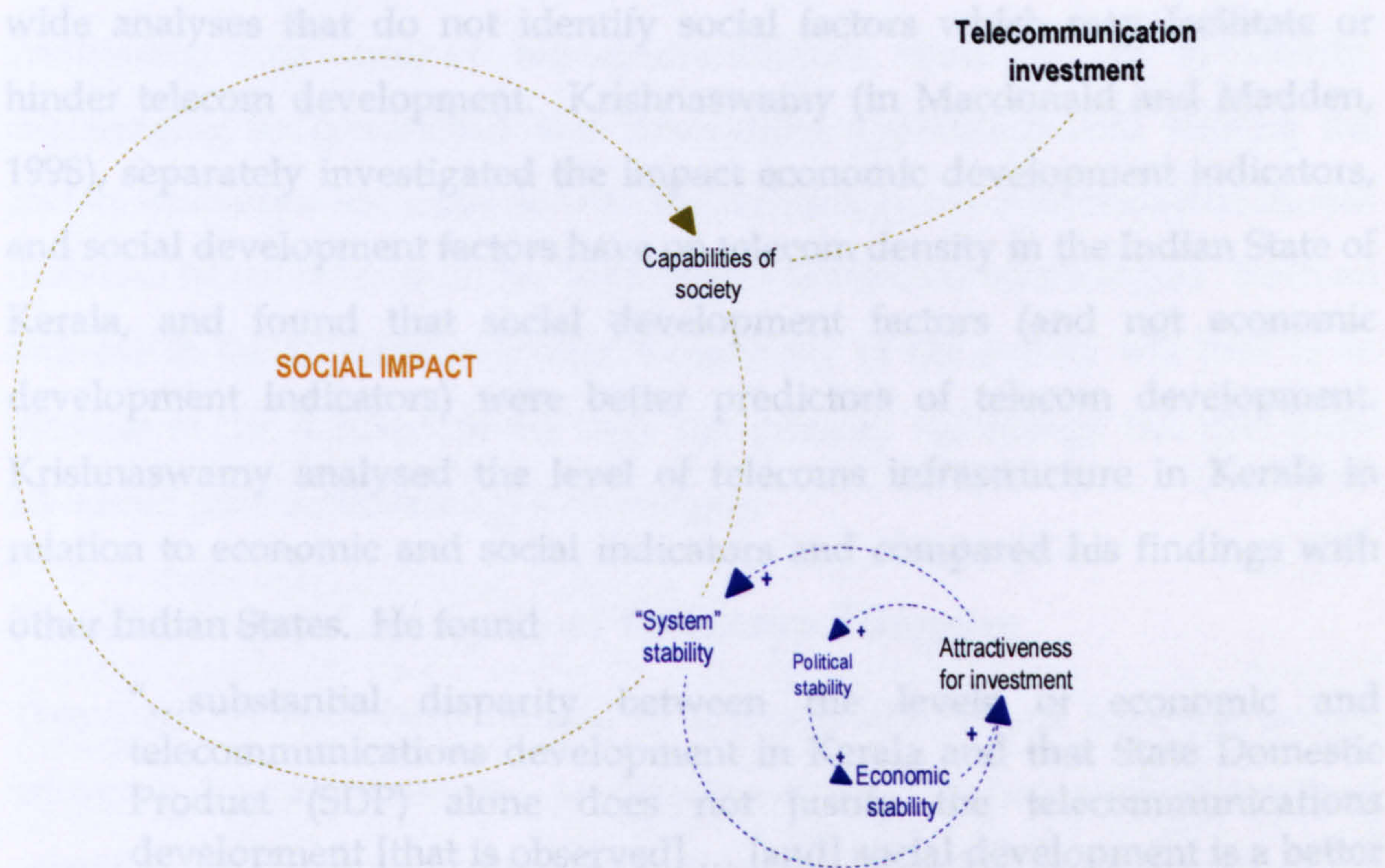


Figure 17: Sub-section of Influence Diagram: Social Impact Cycle

According to Avgerou (1998), economic and social theories converge on the suggestion that the diffusion of information and communication technologies (ICTs), and rise of information activities do not lead deterministically to economic growth. Rather, ICTs bring about “creative destruction” (Schumpeter, 1939) that lead indirectly to economic benefits. The societal factors that therefore contribute towards realisation of the benefits of telecoms must therefore be taken into consideration when analysing the impact telecoms has on economic development. This is of particular importance as:

“...the technology and physical resources of society (the underlying forces of production) at one time determines the institutional structure of the society at a later time (the social relations of social organisation of production), and the institutional structure at one time determines

the laws, culture, and ideas of the society (the superstructure) at a later time." (Parker, 1976)

Most studies concerned with the causal relationship between economic development and telecommunications development are however economy-wide analyses that do not identify social factors which may facilitate or hinder telecom development. Krishnaswamy (in Macdonald and Madden, 1998), separately investigated the impact economic development indicators, and social development factors have on telecom density in the Indian State of Kerala, and found that social development factors (and not economic development indicators) were better predictors of telecom development. Krishnaswamy analysed the level of telecoms infrastructure in Kerala in relation to economic and social indicators and compared his findings with other Indian States. He found

"...substantial disparity between the levels of economic and telecommunications development in Kerala and that State Domestic Product (SDP) alone does not justify the telecommunications development [that is observed] ... [and] social development is a better predictor of telecommunications development." (Macdonald and Madden, 1998, p. 346 and 348)

Social development is however a complement and not a substitute to economic growth, and Krishnaswamy's findings should not be taken to mean that the development of telecoms infrastructure can be achieved whilst exclusively pursuing social goals without considering the state of the economy.

Furthermore, the stability of a country's economic system is intrinsically linked to the stability of its political and social systems. Disruptions and/or progressions in one system can therefore be seen to force a change in the other. In other words, in order to survive the changes telecommunications brings about in the economic system (improved coordination,

internationalisation of markets etc.) and in the political system (reduction of information asymmetries, increased opportunities for participation etc.), the social system must be able to come to terms with the impact of these changes on its own structure, adapt to them and utilise them for its own progression.

Facilitating local use of telecommunications, building up familiarity, encouraging its (prescribed and innovative) application, and helping the society discover what it can do with the technology are initiatives that should therefore be considered in the deployment of telecom technologies. Such an increase in the telecommunication's capability of the society will lead to an increase in the demand of not only the primary technology but also more advanced (and economising) technologies.

7 Findings of Analysis of Influence Diagram

Two methods have been utilised in drawing conclusions from the overall influence diagram presented as Attachment 1. The first method involved counting the number of links originating from and feeding into each of the variables represented in the diagram. This made it possible to identify the variables that are 'central' in the relationship between telecoms and economic growth depicted in the diagram. These central variables influence a number of other factors in the diagram (have several links originating from them) and are themselves influenced by several other factors (have a number of links feeding into them). They are

- a. Telecommunications investment and
- b. Market efficiency and productivity

These two variables can therefore been used to summarise the findings of the literature review.

The second method used in drawing conclusions was an examination of the aggregate sign - whether "+" or "-", of each of the cycles represented in the

influence diagram. This examination revealed that the diagram consists predominantly of positive reinforcing cycles, implying growth or increasing effects. So (for example) growth in the telecom investment goes through the Economic Cycle to produce more growth in investment. There are also negative reinforcing cycles in the diagram which produce restricting, limiting or opposing effects the initial change. Cycles that explain the “Telecom supply gap” and “Technology and productivity gains” within the geographical proximity cycles are negative, as is the “Information costs” portion of the “Market Cycle”. The impact of these negative reinforcing cycles will be discussed later in this section.

7.1 Findings from ‘central variables’ analysis

7.1.1 Telecommunication Investment

It can be implied from the influence diagram (Attachment 1) that the level of investment in telecoms that occurs in any given country has a direct impact on the quality and quantity of telecom infrastructure in that country, and on the availability of telecom services. That this influence diagram emphasises the importance of investment also highlights the importance of acquiring funding for telecoms development. As discussed in section 3.2, a nation often has to undergo “structural changes” (Riaz, 1997) in order to attract the necessary investments it requires to facilitate telecom development. One of the aims of these changes is the creation of a market-regulated telecoms environment in which demand for telecoms is driven and supported by the market, and inefficiencies are restricted.

The relationship between telecommunications infrastructure and economic growth can therefore be described according to these structural changes. On the one hand structural changes in the economy by making funding accessible for investment precipitate the proliferation of telecommunication technologies. On the other hand, the proliferation of telecom technologies

unleashes numerous potentials for the economy making it more attractive for further investment.

7.1.2 Market efficiency and productivity

Telecommunications enables organisations to lower cost structures and create new market mechanisms (Kambil and Short, 1994; Benjamin and Wigand, 1995 both cited in Dutta, 2001). Better telecommunications also leads to better integration of markets, increased income and overall market efficiency (Eggleston et al. in Kirkman et. al., 2002). However, what alleviates low overall living standards is growth of the nation's total output (Lipsey, 1994). Thus, not only do markets have to be efficient, they must also grow. We therefore find that in the influence diagram (Figure 18) "Market efficiency and productivity" is represented as exerting positive influences on "New market mechanisms" and "Market growth".

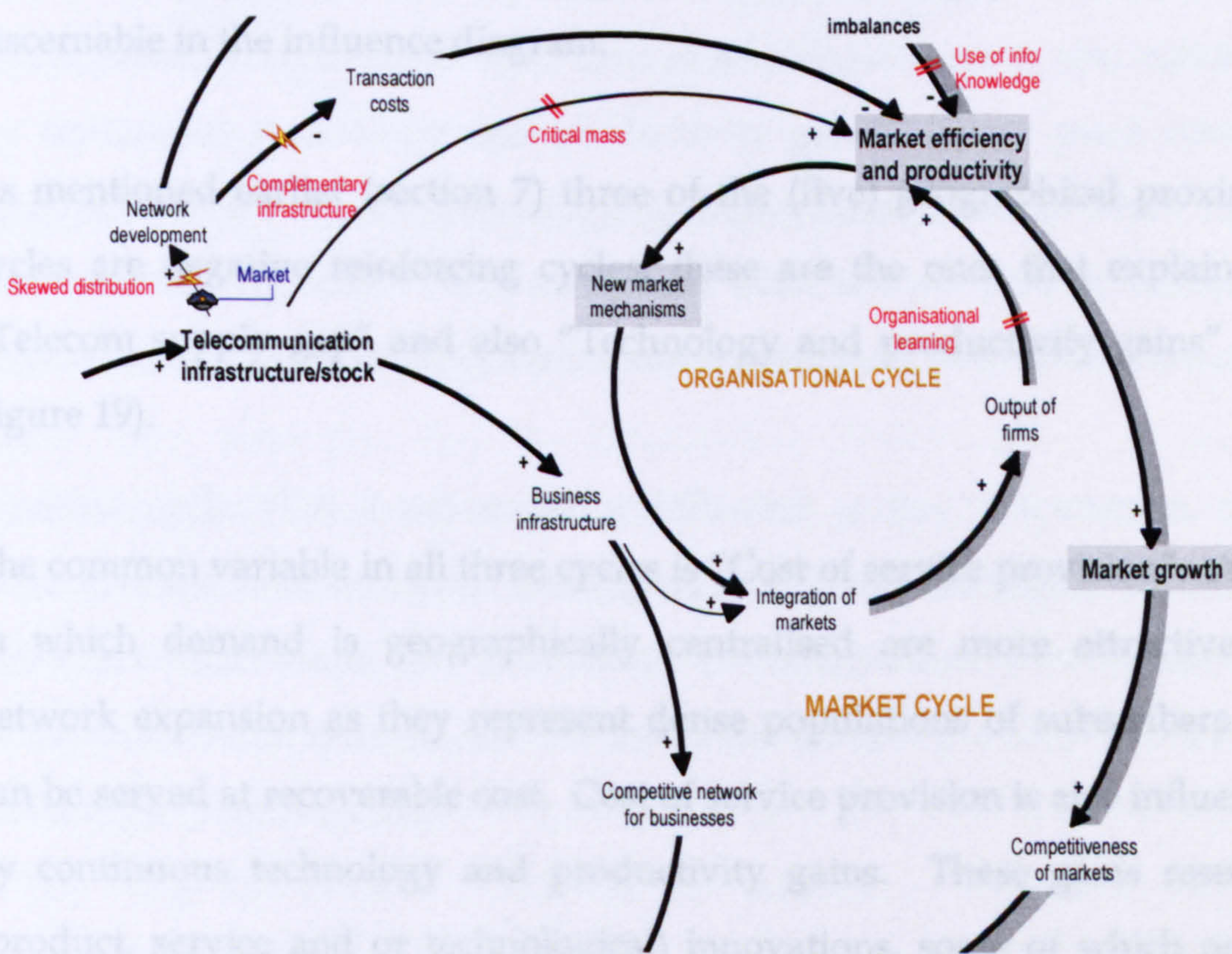


Figure 18: Sub-section of Influence Diagram: Market efficiency and productivity

Thus the review of literature leads to the belief that increases in market efficiency and productivity should lead to new ways of delivering products and services to existing and new markets. Improvements in market efficiency and productivity should also lead to general market growth and the accrual of the socio-economic benefits that are claimed to accompany such growth.

7.2 Findings from 'aggregate sign' analysis

In order to realise the potential of telecoms to grow national output, the population of the country must be able to gain access to and use the technology. The distribution of the telecom network across the geographical space of a country therefore has a direct impact on the supply pattern of telecom services in the country, and the more geographically dispersed a country's population is the more likely it is that access to telecoms will be inequitable. This limiting effect of geography on network distribution is also discernable in the influence diagram.

As mentioned earlier (section 7) three of the (five) geographical proximity cycles are negative reinforcing cycles; these are the ones that explain the "Telecom supply gap" and also "Technology and productivity gains" (see Figure 19).

The common variable in all three cycles is "Cost of service provision". Areas in which demand is geographically centralised are more attractive for network expansion as they represent dense populations of subscribers that can be served at recoverable cost. Cost of service provision is also influenced by continuous technology and productivity gains. These gains result in (product, service and or technological) innovations, some of which on the one hand directly reduce costs, and on the other unleash pent-up demand in underserved regions, making them more attractive for network expansion.

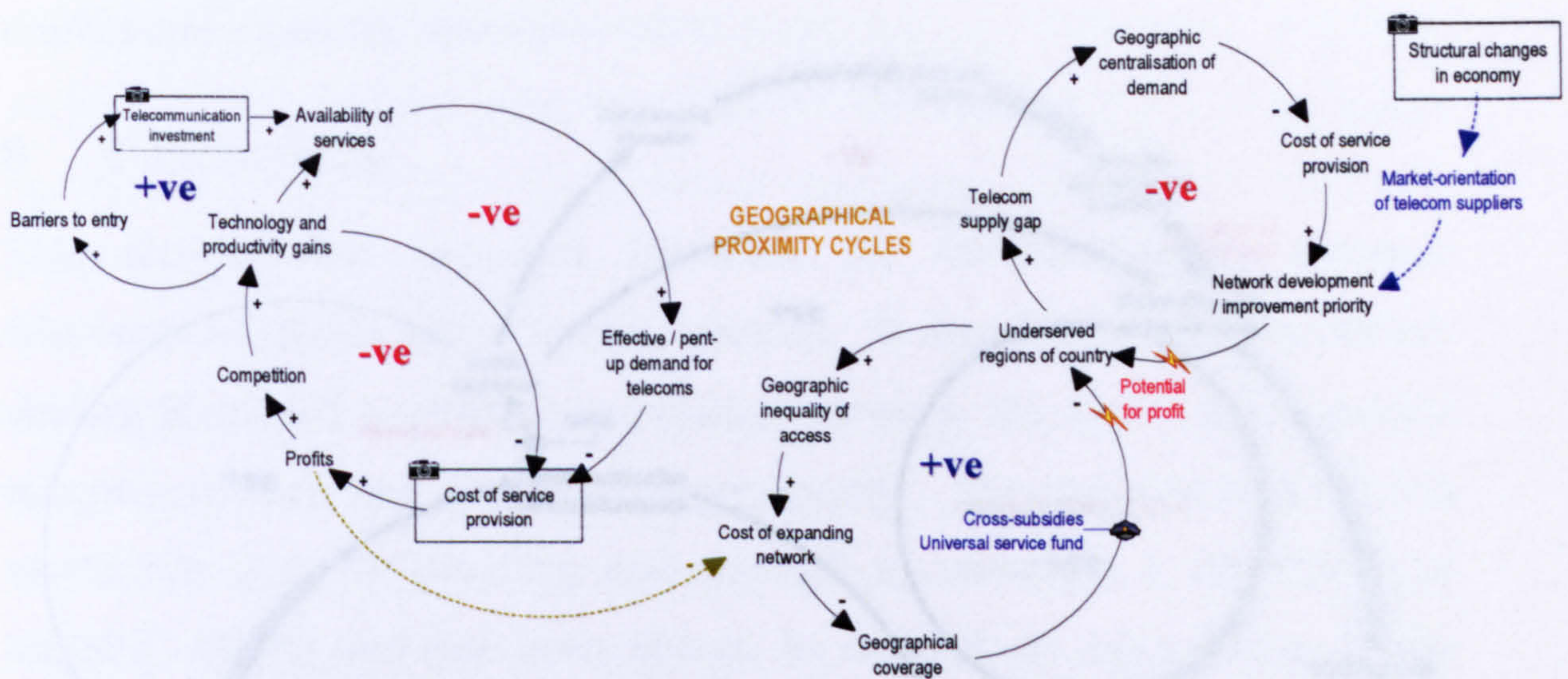


Figure 19: Geographic Proximity Cycles showing negative reinforcing cycles

The common variable in all three cycles is "Cost of service provision". Areas in which demand is geographically centralised are more attractive for network expansion as they represent dense populations of subscribers that can be served at recoverable cost. Cost of service provision is also influenced by continuous technology and productivity gains. These gains result in (product, service and or technological) innovations, some of which on the one hand directly reduce costs, and on the other unleash pent-up demand in underserved regions, making them more attractive for network expansion.

Another cycle with a net negative influence is the "Information costs" portion of the "Market Cycle" (see Figure 20 below). The higher information costs are, the more the occurrence of information asymmetries and imbalances in the market, and the lower the efficiency and productivity of the market (Frieden, 2000).

Information, reducing uncertainty and thereby boosting the growth of the market and economic activity.

8 Conclusions

This chapter has reviewed literature on the relationship between telecommunications and economic growth. It found that economic studies identified a positive association between the level of country's telecom network and economic prosperity. The nature of this association (e.g. the direction and strength of the relationship) is the subject of ongoing debate and has been shown to depend on such things as the economic status of the country, social development factors, geographic dispersion of the country's population, existing levels of telecom infrastructure, etc.

This chapter reviewed micro-economic models that explore the manner in which telecommunications exerts its influence on economic growth and vice versa. Such studies have shown that by reducing the cost of acquiring and transmitting information, telecommunications improves the management of market transactions and this in turn creates demand for more and better

Figure 20: Market Cycle showing negative effect of information costs

In fact, the market for certain goods and services may at times fail or not come into existence due to information deficiencies. Inadequate telecommunications contribute to high cost of transmitting information; it reduces the use of existing information and also inhibits the production of new information (Bedi, 1999; Stiglitz, 1988 in Chenery and Srinivasan, 1988). Inadequate telecommunications can therefore reinforce the information asymmetries and deficiencies that exist in the market and limit the extent to which trade can occur. It can thus be concluded that where access to telecommunications constitutes a reduction in the cost of acquiring (and transmitting) information, it results in an increase in the diffusion of

information, reducing uncertainty and thereby boosting the growth of the market and economic activity.

8 Conclusions

This chapter has reviewed literature on the relationship between telecommunications and economic growth. It found that macro-economic studies identified a positive association between the level of a country's telecom network and its economic prosperity. The characteristics of this association (e.g. the direction and strength of causality) is the subject of ongoing debate and has been shown to depend on such things as the economic status of the country, social development factors, geographic dispersion of a country's population, existing levels of telecom infrastructure, etc.

This chapter also reviewed micro-economic studies that examine the manner in which telecoms exerts its influence on economic growth and vice versa. Such studies have reported that by facilitating easier acquisition and distribution of information, telecoms improves the management of market transactions and this in turn creates demand for more and better telecommunications.

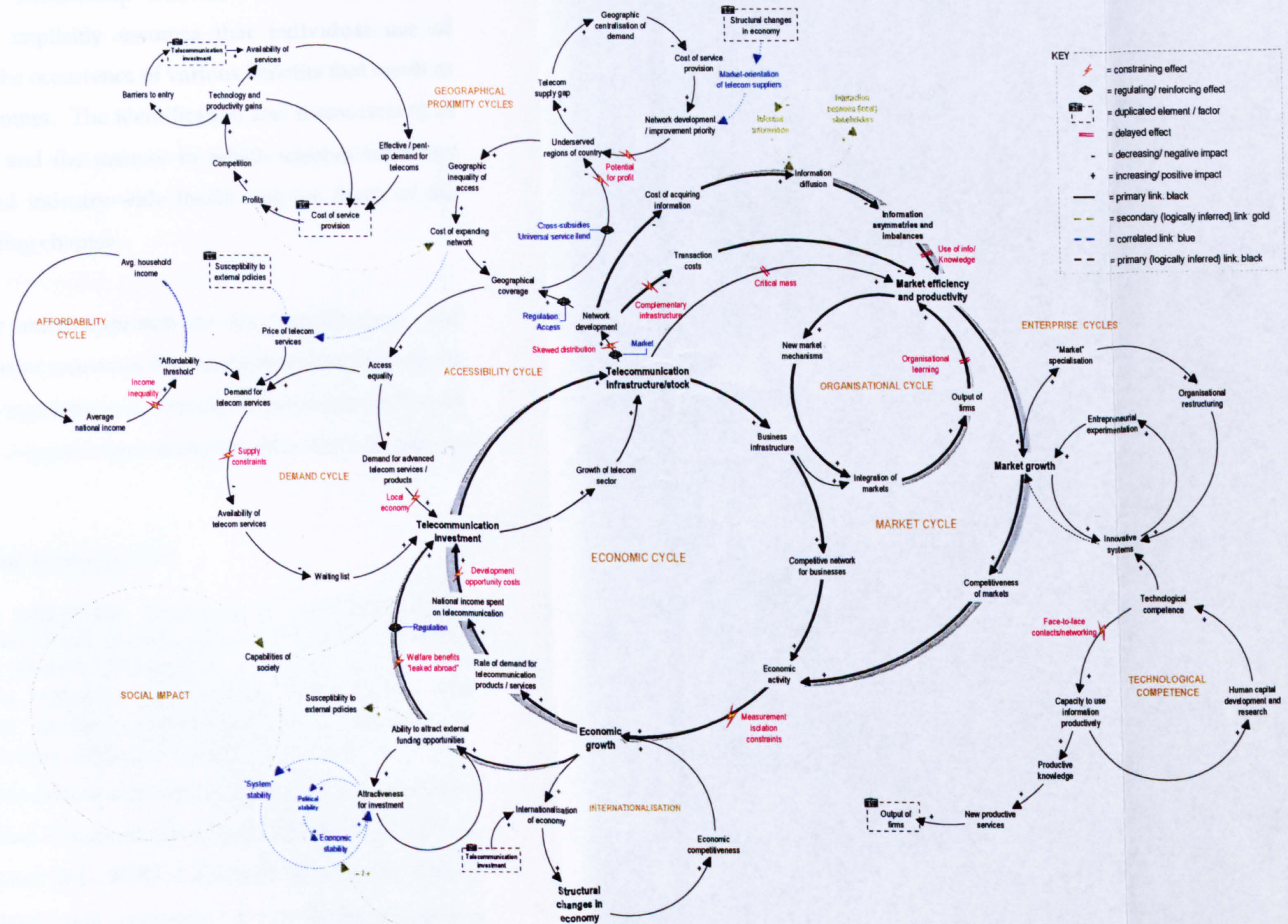
Positive self-reinforcing cycles were thus seen to emerge from the literature implying that increasing investment in telecoms produces virtuous cycles of economic growth (as illustrated in the accompanying influence diagram - Attachment 1).

However, in practice these virtuous growth cycles have generally been elusive to empirical measurement. This review of the literature has therefore also highlighted the variables and factors that "hinder" the link between telecoms and economic development. Using the accompanying influence

diagram (Attachment 1), an analysis of the aggregate signs of defined cycles of influence revealed that information costs, and the influence of geography on the cost of providing telecom service are just some of the limiting factors on the otherwise positive (reinforcing) association between telecoms and economic growth.

Although these are by no means the only limiting factors on the telecoms-economic growth association, they do however form the basis of the focus of this thesis and are therefore discussed in greater detail in the following chapter. Chapter 3 therefore discusses the role of information in economic development and will focus on how it influences the formation of economic organisations. The impact of geography on the availability of information will also be discussed as a means of understanding the impact distance has on the way in which trade is organised. Both of these discussions set the scene for analysing the possible role of telecommunications in facilitating more efficient ways of organising and conducting trade, and thus of contributing to economic growth.

Attachment 1: Inference Map of Literature Review



Chapter 3 Literature Review: Information, Economic Organisation and Telecommunications

1 Introduction

Economic thinking on the relationship between telecommunications (telecoms) and development implicitly assumes that individual use of telecom technologies triggers the occurrence of various benefits that result in measurable development outcomes. The identification and measurement of these development outcomes and the manner in which telecom facilitates their existence at national and industry-wide levels was the focus of the studies reviewed in the preceding chapter.

This chapter takes a more micro-approach to the identification and measurement of the development outcomes that result from telecom use. It reviews studies conducted at organisational, household and individual levels and looks for examples to support telecommunications contribution to economic growth.

2 Micro-level Impact of Telecom Use

“Telecommunications contributes to economic development by providing better market information; improved transport efficiency and more distributed economic development; reduced isolation and increased security for villages, organizations, and people; and increased connectivity to (and coordination with) international economic activity.” (Donner, 2004a, p.3 – citing Saunders et. al., 1994)

Given the benefits attributed to telecoms (as summarised in the quote above) studies have sort to assess and document the impact telecoms has had on activities in the *Informal Economy* (ILO, 2000) of developing countries. This is in recognition of the significance such economies have on development at a national level, and the contribution it makes to the fortunes of those participating in informal sector activities:

“Informal sector micro- and small-enterprises are now directly linked to the main objectives of development (including) increased production, employment and wealth creation; and (are) a key ingredient in poverty reduction.” (Palmer, 2004:31)¹⁹

Technologies that enhance activities within the informal economy are therefore said to also enhance the development potential of those participating in it. Telecommunications, primarily due to the information economising ability it conveys, has been identified to be such an enhancing technology.

However, evidence of such impact of telecoms has been limited. Whilst some innovative applications of telecoms have been reported as increasing the economic abilities of the poor; for example, the use of telecom technologies to disseminate information on production techniques enables farmers in the Pacific region to participate in national and global markets “in an ecologically and socially sustainable manner” (Halavatau, 2003). Also, by providing weather information and market prices, operators such as Manobi are cited as transforming the manner in which agro-businesses in some African countries operate (Scott et al., 2004). Yet for the most part many of these initiatives are still in pilot or demonstration phases and have yet to prove profitable, sustainable and scalable (Scott et al., 2004). This chapter discusses why this may be so by reviewing studies that have sort to measure, empirically and conceptually, the impact of telecoms.

2.1 Impact of Telecoms on Small and Medium Sized Enterprises

The first group of studies to be reviewed measure the impact telecoms has on the economic performance of small and medium sized enterprises (SMEs). SMEs (defined as firms with 10-100 employees²⁰) generate a substantial

¹⁹ There is debate as to whether and the extent to which the informal economy contributes to poverty alleviation. See Palmer (2004) for a summary of both sides of the debate..

²⁰ European industrial relations observatory <http://www.eiro.eurofound.eu.int/>

percentage of the national income of developing countries and contribute significantly to the economy in terms of employment and value-added (Chowdhury and Wolf, 2003 and references therein). The contribution of telecoms to their performance is therefore of importance. The key contribution telecoms make to the operations of markets (in general) is through its impact on information costs (Bedi, 1999). The costliness of information and the changes in the behaviour of individuals when information is incomplete or asymmetric influences the functioning of markets, institutions and organisations. These influences are particularly felt by SMEs in developing countries as the markets they operate in are generally characterised by high degrees of ambiguity and uncertainty (Müller-Falcke, 2001 and references therein).

The use of telecoms for business purposes in such environments is quoted as resulting in the restructuring of production processes and transaction methods, increase in flexibility, and improvement of the output of the business (Chowdhury and Wolf, 2003). How much of this potential is however actually observed or realised in practice? First and foremost, research has shown that awareness about information and communication technologies (ICTs) does not lead to their immediate application (Müller-Falcke, 2001; Adam and Wood, 1999). The investment required in obtaining such technologies is usually substantial as is the learning cycle required to make effective use of them (Scott et al., 2004).

Where they have been adopted, Adam and Wood (1999) found no evidence of ICTs being used to gain competitive advantage at the organisational level. They observed however a high impact on individuals working in information services and computer businesses (see also Heeks, 2005). Frequent users that fall under this category were able to achieve efficiency and cost reductions in document processing. Using an empirical approach,

Chowdhury and Wolf (2003) reported that ICTs had a positive impact on the ability of SMEs to expand their coverage of domestic markets. They also however found that ICTs had a negative impact on labour productivity, no significant impact on the enterprises' return, and no impact on its potential as an exporter. Duncombe and Heeks (1999, 2001) also noted the positive impact ICTs had on market expansion but (as did all the other studies mentioned) stressed technology on its own offered no solutions. Rather it is the ability of the technology to stimulate existing institutions and infrastructure, and the presence of other resources such as skills, markets, and finance that can generate the advantages that spur on growth (Chowdhury and Wolf, 2003; Duncombe and Heeks, 1999; Adam and Woods, 1999)

2.2 Impact of Telecoms on Households and on Microenterprises

Microenterprises are businesses with five or fewer employees (Donner, 2004a). As with SMEs they are a critical part of the economies of many developing countries and support many households (Mead and Leidholm, 1998). Microenterprises are difficult to differentiate from the households they support and as such this review considers research conducted at both levels together:

“The lines between a household, its businesses, and the individuals involved in the enterprise are often blurry. In matters of finances, time, relationship obligations, location, and ICT use, delineating the needs and behaviours of the enterprise (versus that of the household) can be difficult.” (Donner, 2004a, p. 2)

Furthermore, the observed needs at this level of research have been shown to relate more to the ability to communicate as opposed to access information services (Donner 2003). This has had an impact on the technology found to be relevant and most frequently used by this group of people. Telephones and not the Internet or personal computers have been identified as the most

relevant ICT to micro businesses in developing countries. Duncombe and Heeks (2001) described the telephone as:

“...the information-related technology that has done the most to reduce costs, increase income and reduce uncertainty and risk. Phones support the current reality of informal information systems, they can help extend social and business networks, and they clearly substitute for journeys and, in some cases, for brokers, traders and other business intermediaries.” (2001, p. 18)

Welfare benefits have also been attributed to the use of telephones; access to telephones greatly enhancing the sense of security and well being experienced by households (Souter et al. 2005; Goodman, 2005; Gamos, 2003).

However, with respect to economic gains, Bertolini (2002, 2001) confirms some of the benefits of telephone used listed by Duncombe and Heeks (2001) above. His studies of households in the southern Volta region, Ghana found that their use of telecom services enhanced business-related information flows, lowered transport costs and supported complementary market relationships. Samuel et al (2005) also report time and cost savings through reductions in travelling - as telephone use substitutes for making journeys. Their study also attributed increases in business profit experienced by telephone users to efficiency gains including increases in availability (to clients) and improvements in communication abilities.

Telephones have also been observed to extend the business networks of microenterprises by allowing them to develop business contacts that they previously could not or did not maintain (Donner 2004b; Duncombe and Heeks 2001). An important point to note in the impacts observed by these studies is that telephones are in general of more relevance in saving money than for earning money. Although Donner (2004b) makes mention of telephones use in establishing new contacts, further studies (Donner, 2005) revealed that these new contacts were within the user's geographic neighbourhood. This suggests a geographic impact on new business

development in microenterprises that mere access to a telephone is not addressing. Further evidence of this geographic impact is found in other studies that show that whilst the benefits resulting from better access to information through the use of telecom technologies appear relatively easy to reap, when it comes to business communications, microenterprise users still prefer, and in fact opt for, face-to-face interpersonal meetings for business communications (Souter et al. 2005, Halavatau 2003, Duncombe and Heeks, 1999).

2.3 The Purpose of Telephone Calls

Where the use of telephones by developing country populations has been studied at a general level (rather than focused on its application in businesses) it is revealed that actual use of the technology is predominantly for personal rather than business uses (Bertolini 2002, Bayes et al., 1999; Saunders et al., 1994). A Gamos (2003) study on the use of telecom services amongst rural and low-income communities in Botswana, Ghana, and Uganda identified that calls relating to business matters were in total about half the number of calls made to friends and family. A more recent study of the economic impact of telecoms on rural households in India (Gujarat), Mozambique, and Tanzania found that:

“...Only about 5% of users identified business as their primary use of the telephone” (Souter et al. 2005:12).

Specific to micro businesses, Donner’s (2004b) analyses of the calling behaviour of micro-entrepreneurs in Kigali, Rwanda found that only one third of their calls were business related; leading him to challenge the impression that the typical call made by a micro-entrepreneur is:

“...an instrumental, market-oriented action, made to reach customers or check on prices” (2004b:7).

2.4 Summary of Micro-level Studies

It is increasingly common to see the use of superlative terms in describing the take-up of telecom technologies in developing countries (Samuel *et al.*, 2005; Goodman, 2005). Propelled by the results of macro-level studies associating economic growth with telecommunications infrastructure, the rapid adoption of the technology has raised hopes amongst members of the developing community and within developing countries that developing nations will somehow “leapfrog” into prosperity. This optimism has feed into the general press with such headlines as “Some Prefer Cell Phones than Fridges” (Gaomas, 2005) reflecting the importance apparently attached to telecommunications.

More studies on the use of telephones by households and businesses in developing countries are no doubt required. However of those that are currently available, some have been able to highlight economically beneficial effects of telecom use. Yet even when these potential benefits on business performance are acknowledged by the participants of these studies, the adoption and use of telecom technologies for business purposes is neither widespread nor frequent.

The research on which this thesis is based seeks to contribute towards understanding the contribution telecoms makes to economic growth. It aims to identify a need for telecom services in a selected case study and document the manner in which telecoms is used to meet this need and the economic impact it has had (if measurable) on its users.

In order for the thesis to do this, a rationale for examining how telecoms can influence the economic potential of its users must be developed, and this is the focus of the rest of this chapter. Duncombe and Heeks (1999) identified information as the starting point for understanding any impact information

and communication technologies have on society (be it economic or social) – according to them, ICTs are merely new mechanisms for handling an existing resource (information). This research therefore originates from an assessment of the influence information has on the behaviour of organisations and individuals when conducting trade, and the impact telecoms has on the way information is acquired for trade.

The rest of the chapter proceeds as follows. The next section (section 3) defines some key terms, whilst section 4 presents an overview of the role of information in the formation of organisations. This overview draws on various interpretations of firm theory and aligns itself with the information-centred proposition that uncertainty and the risk of opportunistic behaviour are key drivers of economic organisation. This is followed in section 5 by a discussion of the way in which organisations function. Specific attention is paid to the function of intermediaries in organisations (section 5.2) particularly the role that they play in providing information and centralising trade exchanges.

The centralisation of trade is further discussed within the broader context of geography in section 6. Geography is defined in terms of physical distance between places and the manner in which telecommunications can be used to manage this distance - facilitating the centralisation of exchanges on the one hand and the distribution of production, consumption and distribution on the other - is highlighted in sections 6 and 7. The three key elements: information, the organisation of economic activity, and telecommunications are then brought together and their interrelatedness discussed in section 8. This discussion sets the background for the presentation of the research's conceptual framework in Chapter 4.

3 Definition of Key Terms

In order to facilitate the discussion on the role telecoms plays in the development of economic organisation, it is necessary to define some of the key terms that will be used. Within the context of this thesis, *economic* as used in the term *economic organisation* relates to the production, development, and management of material wealth by an individual or business enterprise. *Economic* implies that goods and services are exchanged for payments that are commensurate in value - with value being defined purely in monetary terms²¹.

Organisation refers to a grouping of people and/or firms for a defined purpose and time period, either formally through binding contracts or informally through shared understanding. Furthermore, economic organisations are made up of elements with varied functions that contribute to the whole, and to collective functions²². Thus in this thesis, the definition of an economic organisation is limited to a structure through which individuals cooperate systematically to exchange goods and services for money.

The term *development* is used to indicate progression towards a more efficient state. This thesis is based on the assumption that the flow of information supports the flow of goods and services (Casson, 1997) and as such information facilitates the function of economic organisations (as defined in the preceding paragraph). Development, within the scope of this thesis, therefore refers to the ability of an economic organisation to use the

²¹ This definition draws from the simplified circular flow model of a market economy in which resources are transferred from household to businesses, and goods and services are transferred from businesses to households. Money accompanies the transfer of resources, goods, and services.

²² This definition of organisation derives from the verb form to organise rather than the noun form used to identify firms.

communications infrastructure at its disposal to improve flows of information in ways that maximize the exchange of goods and services for money.

Furthermore, as communication infrastructures evolve to provide opportunities for better information flows, it is envisaged that economic organisations will respond by reorganising themselves into structures that can better take advantage of the improved communication ability to maximize economic exchanges. Therefore, it is expected that at any given time, it is the most efficient form of economic organisation that will dominate the exchange of a particular good and/or service.

4 The Need for Information as an Origin of Economic Organisation

Having defined the key terms, this chapter now discusses the importance of information in coordinating economic activities within organisations, and the relevance of using an information-centred approach in examining the role telecoms plays in the *development of economic organisations*.

A way in which an economy can be subdivided is into the supply of factors of production, goods and services on the one hand, and their demand and subsequent consumption on the other (Ricketts, 2002). Suppliers of labour, capital, intermediate inputs, raw materials, land etc. must cooperate with each other to produce outputs of goods and services. At the same time, consumers of these goods and services work together with producers (and vice versa) to satisfy their needs and generate future demand. The need for cooperation requires considerable amounts of coordination and the way in which coordination it is organised/conducted in the economy can differ considerably; with 'markets' at one extreme and 'hierarchies' at the other (Williamson, 1981).

4.1 Market Organisations

Market organisations are synonymous with direct exchange between buyers and suppliers and are predominantly made up of discrete (one-off) transactions. In this form of organisation, the parties involved in the transaction are motivated primarily by self-interest (Maxwell, 1999) and have limited commitment to each other outside of each transaction. They can therefore choose to purchase from, or sell to anyone and as such, market settings are characterised by webs of potential linkages between alternative sources of supply and demand.

The different costs²³ incurred in comparing one potential trade partner against another, especially when these alternatives are not perfect substitutes for each other, can however be high. Furthermore, for the comparison to be accurate, the person making the comparison must have 'complete information' about the product or service, as well as about alternative buyers/sellers. Only then can they determine with near certainty, the benefits of transacting with one buyer/seller over another (Ricketts, 2002).

However, complete information rarely (if at all) occurs in reality (Phlips, 1988); and gaps in information cause buyers/suppliers to act in their own best interest when prospecting and engaging in trade. Market organisations are therefore inappropriate for transactions in which either (a) the risks associated with such self-seeking behaviour is high (Williamson, 1981) or (b) the costs associated with evaluating different alternatives for each transaction (Coase, 1996) are also high. When these two conditions are the case, coordinating and/or conducting trade within hierarchies is more cost efficient and offers trading parties more protection against risk (Dietrich, 1994).

²³ These include information costs, and costs associated with bargaining and enforcement of the conditions of the exchange

4.2 Hierarchical Organisations

A hierarchy coordinates the resources for producing goods and services and at the same time allocates these goods/services once produced between its customers. Skills and competencies are therefore concentrated within hierarchies and are centrally supervised (Coase, 1996). Exchanges occur between different parts of a hierarchy and transactions are 'internalised' within formalised organisations or relationships. This allows for better decision making when information gaps occur during the course of a transaction. This benefit stems from the centralized structure of this type of organisation:

"The benefits of centralized control stem from the hub and spoke view of the firm. It is less expensive for all information to be transmitted to the center and for important decisions to be sent from the center to the periphery of an organization than for all individuals to communicate with each other." (Arrow, 1974 cited in Spulber, 1998, p. 292)

There are other advantages to hierarchies aside from information management for decision making. Hierarchical structures are also adopted to lower transaction costs (Coase, 1996), or in response to the unpredictable behaviour of trade partners (Williamson, 1981; Hart, 1989; Klein et al. 1978; Alchian and Demsetz, 1972).

4.3 Network Organisations

In between the two extremes of market and hierarchical organisations are a variety of hybrid forms that reflect varying combinations of the characteristics of the two extremes. These hybrids are referred to as 'networks' (Ricketts, 2002) and can be distinguished from market and hierarchical organisations in terms based on the degree of coordination they exhibit.

In general terms, a *network* can be defined as a collection of linkages that joins up a group of elements. 'Elements' here refer to individuals or firms that are

connected to each other by 'linkages' of regular flows of information that are based on some level of trust (Casson, 1997). Trust is an important distinguishing term in this definition because unlike market organisations, transacting parties in networks have some level of commitment to each other. Furthermore, in network organisations, members own and control their own resources thus - unlike hierarchical organisations - skills and competencies are dispersed rather than centralised.

The different economic organisations described above are summarised in the Table 1: below:

Table 1: Market, Hierarchical, and Network Organisations

Intensity of trust	Distribution of skills and competence	
	Dispersed	Concentrated
High	Network	High-trust Hierarchy
Low	Ordinary Market	Low-trust Hierarchy

Source: Modified from Casson, M. (1997) "Information and Organisation: A New Perspective on the Theory of the Firm" p. 124

Some variation applies to these organisational classifications and some types of economic organisations do not fit neatly into the categories listed above. This notwithstanding, the above discussion implies that economic organisations have identifiable structures/forms that can be discerned based on patterns of interaction and coordination, and that these patterns provides a basis for comparing one organisation alternative with another (as will be done later in this thesis).

4.4 The Need for Information

As mentioned earlier (see section 4.1) people engaging in trade rarely (if ever) have all the information they need to make when making trade decisions and this lack of information causes buyers and/or sellers to act in their own best interest during transactions. This situation reduces trust in the process of trade. One reason for the existence of economic organisations is to help

establish a level of trust that would enable people to transact with each other. Economic organisations can therefore be described as responses to two major problems of 'incomplete information': uncertainty, and the risk of opportunistic behaviour.

4.4.1 Uncertainty

The problem of uncertainty means that economic activities are continually adjusted in light of constantly changing conditions. Under these conditions, economic organisations can be interpreted as devices for coping with change, allowing for flexibility in the face of unpredictable events (Ricketts, 2002). Such coping mechanisms in economic theory manifest as agreements through which resources and activities can be coordinated. Such agreements result in specialisation by parties, and generate the need to govern and/or monitor the activities of parties, and the process of exchange.

4.4.2 The risk of opportunistic behaviour

Once agreements have been established by transacting parties they require enforcement, especially as:

"People ... cannot be expected to declare honestly and voluntarily information which adversely influences the terms upon which they will trade when there are no cost-effective means of verifying the information." (Ricketts, 2002, p. 43)

From the quote above, the risk of opportunistic behaviour arises because information asymmetry (i.e. a situation in which one of the parties to a transaction is better informed than the other) makes it difficult to accurately judge the outcome of a transaction before it takes place. This makes it difficult to know who is trustworthy in the market and who is not.

Although the way in which people behave during transactions can be publicised after it has been completed and this should create an incentive for people to deal appropriately with each other, this is not enough to guarantee that people will not behave opportunistically.

Risk of opportunistic behaviour therefore gives rise three things, either (a) the development of close, durable relationships based on trust and reputation, or (b) systems of monitoring behaviour that are backed up by sanctions, or (c) a combination of both (Putterman and Kroszner, 1996).

4.4.3 One solution: The formation of organisations

Information therefore, either when completely lacking (i.e. deficiency) or present in uneven proportions (asymmetry), critically influences the relationship between economic entities. Furthermore, because information is also costly to obtain - requiring substantial time, effort and financial commitments, it is influential in determining whether or not economic entities are structured in the first place. In other words, although the absence of, or disparities in information can hinder the process of trade, if the costs of acquiring it are too high, the failure of trade to occur is both predictable and efficient. However, if trade is deemed potentially advantageous, means of enabling it will be devised.

Information needs and the mechanisms of satisfying those needs therefore drive the creation and structure of economic organisations (see Foss, 1997). The structure of economic organisations existing in an industry at any given time can be interpreted as rational responses to the need to economise on information costs (Casson, 1997).

Also, should information costs change, it is anticipated that these structures will also change. Therefore, as technological progress drives down communication costs for example over longer distances, economic organisations may adapt/respond by increasing the geographical scope of their activities. Such evolutions in structure occur to support higher levels of trade, and contribute to the development and longevity of the industry. The

preceding statement is however just a postulation as understanding the way in which organisational forms are selected/adopted in reality remains a key challenge to economic studies of organisations.

Notwithstanding, this thesis proposes to analyse the evolving structures of economic organisations in an industry as a way of deducing the occurrence of development in the industry. The thesis argues that because participants in an industry will always devise ways of enabling trade whenever it is potentially advantageous to them, a study of the evolution of trading activity in the industry would provide a way of assessing the impact of telecoms on the economic performance of such participants. This can be shown by examining the observed evolutions in trading activity and noting whether they were influenced by changes in the characteristic of information in the industry. These changes in information could also be examined to see if they were influenced by telecom technologies.

5 Understanding the Purpose of Organisations

Uncertainty and the risk of opportunistic behaviour have been identified as key problems which necessitate the organisation of economic entities. They create states of imbalance in the market and provide the impetus for the attainment of some form of stability. This is because when possible, economic organisations will seek to achieve a balance (or equilibrium) between supply and demand in the market; mechanisms by which this equilibrium is attempted or achieved are at the heart of economic theories. Such mechanisms include market-matching and market-making activities (Spulber, 1998; O'Hara, 1995)²⁴.

²⁴ Market-matching and market-making are the focus of the branch of economics that investigates market microstructure. According to O'Hara "market microstructure is the study of the process and outcomes of exchanging assets under explicit trading rules." (1995, p. 1). Although market microstructure research is set in the market for financial assets; at an

Market-matching involves bringing buyers who are willing to purchase a good or service for a specific price in contact with suppliers who are ready to sell the good or service for the specified price. Market-making goes a step further and entails the actual holding of inventory by a third party to the transaction (i.e. someone that is neither the buyer nor supplier) in order to facilitate trade between buyers and sellers. Both of these activities balance purchases and sales over time, leading to the more efficient allocation of resources and the “clearing of markets”²⁵. Both activities also require high levels of coordination and information.

5.1 The Function of Intermediaries

The exchange of goods and/or services for money is one of the last events in a chain of market activities. Prior to this, buyers and sellers need to make contact with each other, communicate their wants and explain what they offer in return, negotiate a price, and monitor the fulfilment of their contracts. All these activities are costly to conduct and involve varying degrees of risk; these costs and risks can be reduced through the process of intermediation (Casson, 1997).

Intermediaries are economic agents who facilitate trade between buyers and sellers by specializing in the purchase and sale of products and/or services that are of interest to both parties (Chowdhury, 2002). Intermediation is said to arise due to the existence of frictions in trade. Intermediaries therefore exist when:

- a. It is possible for them to economise on the cost of transactions between buyers and sellers (Townsend 1978)

abstract level it is valuable in understanding the behaviour of intermediaries in markets and is for this reason referred to in this thesis.

²⁵ To clear a market is to achieve a pricing regime that matches purchases with sales (Spulber, 1998)

- b. They are more efficient in making contacts with buyers and sellers than buyers and sellers are in making contact with each other (Rubinstein and Wolinsky, 1987)
- c. When one party to the transaction is better informed than the other (Casson, 1997), for example when a buyer is uncertain about the quality of goods that are being traded (Li, 1998; Biglaiser, 1993).

Under these circumstances, intermediaries help to reduce the risks associated with transactions (Spulber, 1998). On the one hand they hold inventories of goods and stand ready to sell to buyers and on the other stand ready to buy goods from suppliers. They therefore reduce fluctuations in demand and supply by helping to clear goods and even out fluctuations in the patterns of demand and supply.

In addition to reducing risks associated with transactions, intermediaries improve the quality of match between buyers and sellers and contribute to higher production rates (Johri and Leach, 2002). Intermediaries offer buyers a wider variety of goods and because they charge a higher price than suppliers, buyers demand a better match for their needs before they commit to buy. Intermediation therefore influences the quality of match between buyers and suppliers.

Also, when intermediaries can conclude the sales of goods faster than sellers are able to, their influence results in faster production rates. This is often the case in markets for heterogeneous goods²⁶, intermediaries tend to have access to a wider variety of products than other sellers and are therefore more likely to conclude a sale once they have been matched to a buyer. The speed with which this match is attained spurs demand for the specific good or service and impacts positively on production rates.

²⁶ Heterogeneous goods are products and/or services that vary according to characteristics that cannot be superficially assessed (Casson, 1997).

The presence of intermediaries in a market can therefore result in better quality of match between suppliers and buyers, better quality products, and faster production rates. Intermediaries not only contribute to the economic efficiency of transactions but also hold welfare benefits for the industry as a whole.

5.2 Organisation of Economic Activity with Intermediation

The centralisation of economic activity is critical to the ability of intermediation in reducing the risks associated with trade (Spulber, 1998). In centralised exchanges, the coordination of the actions of buyers and sellers takes place at a central place and this centrality adds to the number of potential trading partners and thus increases the likelihood of buyers and sellers encountering a suitable trading partner (as illustrated in Figure 21).

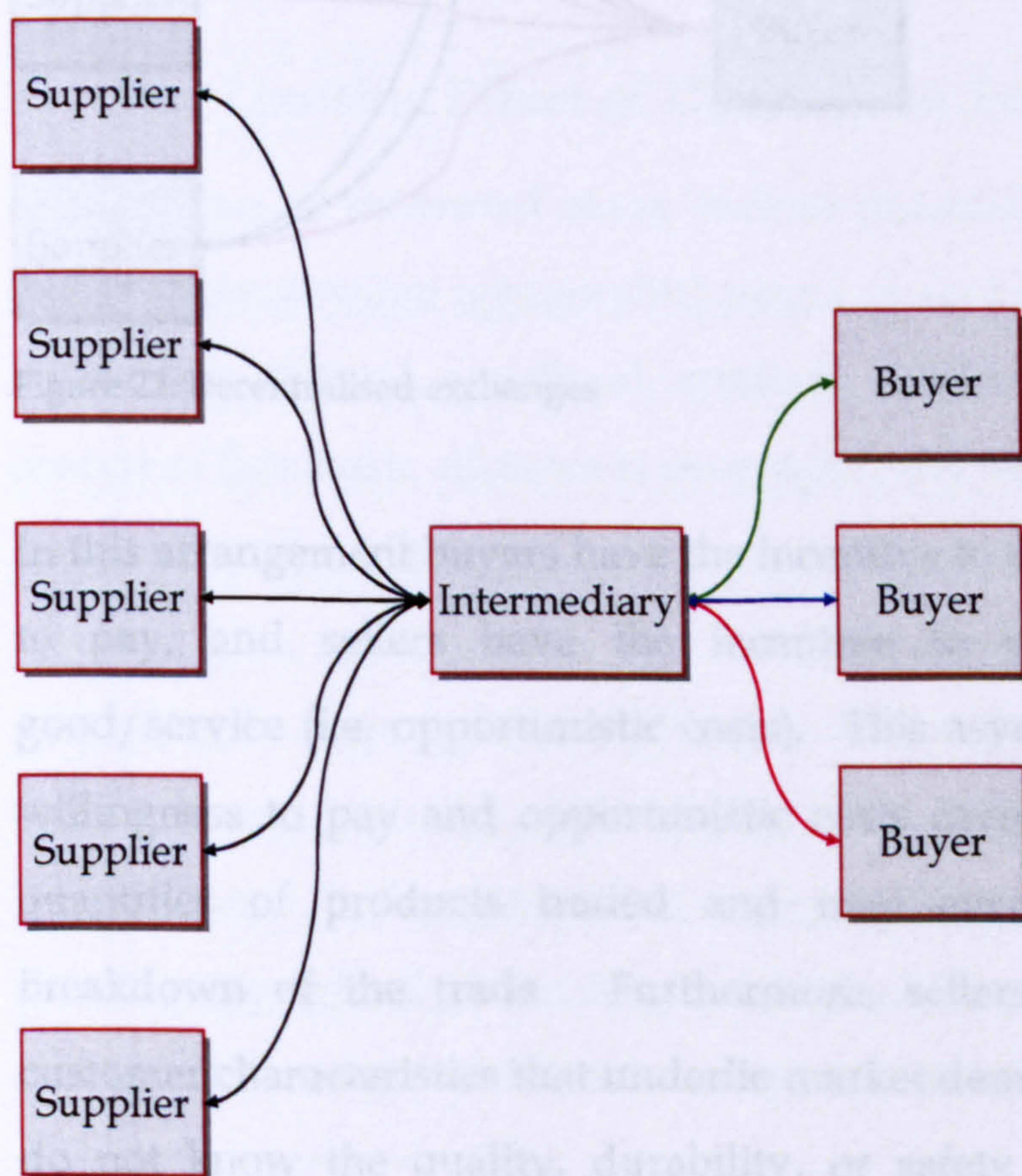


Figure 21: Centralised exchange with intermediation

The uncertainty associated with making a satisfactory match and search costs - i.e. the cost of looking for a suitable trading partner, are therefore reduced in these circumstances. In decentralised exchanges, consumers and suppliers seek each other out and negotiate prices directly (see Figure 22).

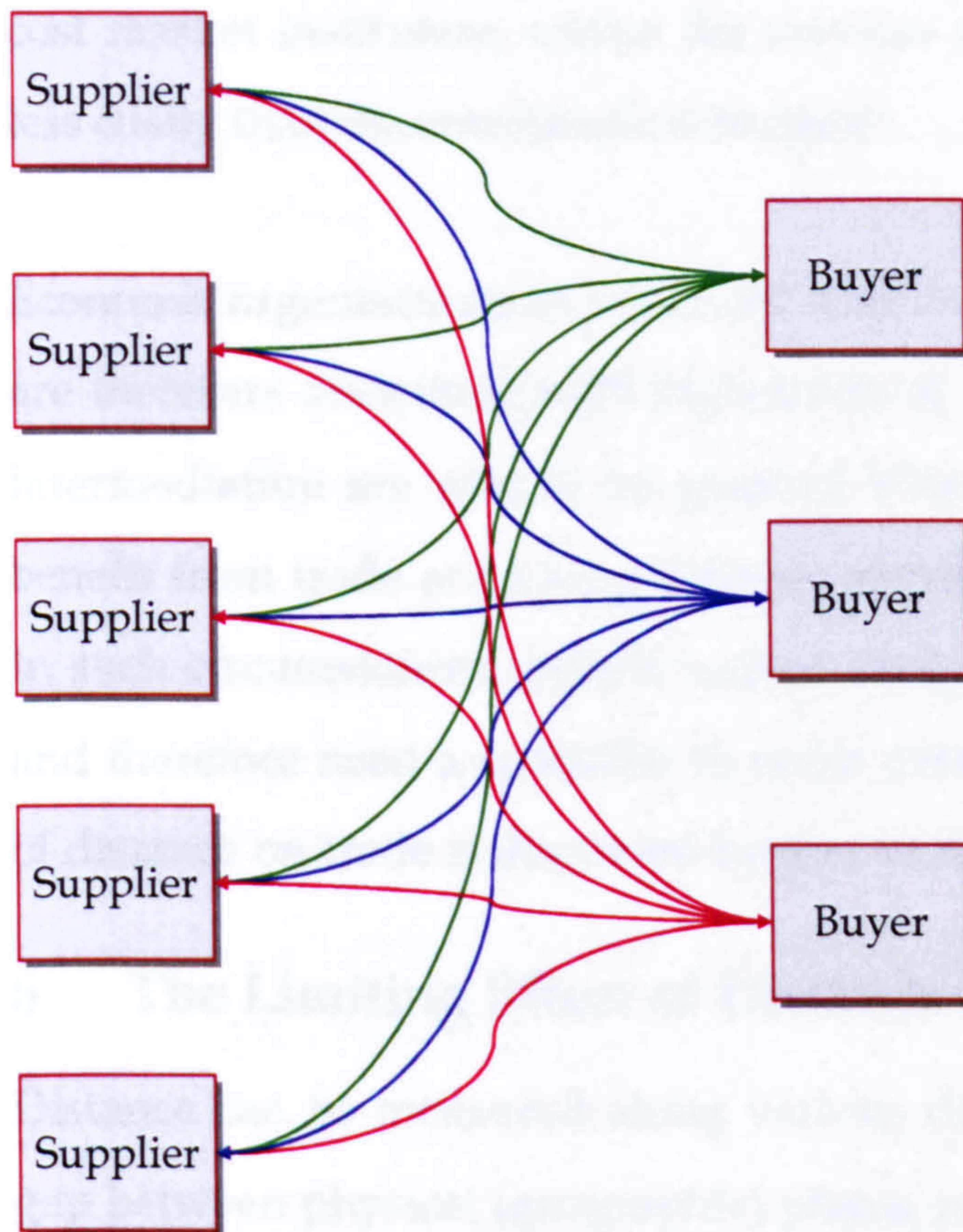


Figure 22: Decentralised exchanges

In this arrangement buyers have the incentive to understate their willingness to pay, and sellers have the incentive to overstate the cost of the good/service (i.e. opportunistic costs). This asymmetric information about willingness to pay and opportunistic costs causes efficiency distortions in quantities of products traded and may even result in the complete breakdown of the trade. Furthermore, sellers often do not know the customer characteristics that underlie market demand, and buyers frequently do not know the quality, durability, or safety of products they seek to purchase.

Collecting and supplying information to customers and suppliers and using this information to establish a pricing regime that matches purchases with sales therefore provide intermediaries with an advantage over decentralised exchanges. In response, economic entities, tending to always adopt the least-cost market institution, utilise the services of intermediaries when they are less costly than decentralised exchanges²⁷.

Economic organisations in which the function of intermediation is prominent are therefore associated with high levels of centralisation and the returns to intermediation are said to be greatest when the people who have most to benefit from trade are a long distance away from each other (Casson, 1997). In such circumstances, people cannot easily make contact with one another and therefore need a specialist to make contact on their behalf. This impact of distance on trade is discussed further in the following section.

6 The Limiting Effect of Distance on Trade

Distance can be measured along various dimensions, either in terms of the gap between physical (geographic) places, or as non-physical states or spaces - including cultural, emotional, spiritual, and even electronic. Within the context of this thesis, distance is geographic and refers to the difference in the physical location of places.

According to Swyngedouw (1993) every human action or event occurs in sequence and can be defined in both temporal and spatial terms. Swyngedouw further states that every social and economic activity is by default geographical in that it is "...inscribed in space and takes place." (1993, p. 305). Following this definition, economic transactions can be described as

²⁷ Williamson (1981) emphasises this substitution stating that firms opt to own and control transaction-specific (or productive) assets through vertical integration when such assets are subject to opportunism in the market. However, ownership of productive assets by firms reduces when binding contracts with intermediaries are feasible.

occurring within geographical patterns - movement is the most obvious link between time and space (Tuan, 1978 cited in Swyngedouw, 1993) – therefore transactions necessitate that the movement by two or more people intersect. What implications does this have on how economic activities are organised?

Movement is constrained by time resources, and overcoming distance usually requires the expenditure of some amount of effort, money, and energy. The finite availability of resources needed to effect movement results in a 'friction of distance'²⁸ (Mitchell, 1999) and this friction influences the frequency of trade and the manner in which economic entities interact.

In general, spatial interactions between people tend to take place more often over shorter distances, and the quality of interaction declines with distance (Venables, 2005). This logically infers that economic entities that are in close proximity will engage in trade with each other more than with entities that are located further away.

The influence distance has on trade however differs and depends on the type of interaction that is required. For certain types of transactions, for example the purchase of convenience goods distance may exert a significant influence on choice of supplier. For other transactions – for example specialist medical care – distance is lower in the list of considerations. It is therefore possible to construct a 'frictionless zone'- in which distance and the costs of overcoming it are relatively unimportant - for different types of transaction (Spulber, 1998), and changes in structure of economic organisations may be interpreted as efforts to expand the 'frictionless zone' of interactions.

²⁸ Defined as the ease with which a person or thing can travel from one place to another (see Transport Geography on the Web <http://people.hofstra.edu/geotrans/index.html>)

6.1 The Mediating Impact of Information and Communication Technologies

The expansions of frictionless zones are increasingly being realised through the use of information and communication technologies. These technologies directly bring about changes in social and economic organisation (Graham, 1998) - whether deterministically (Light, 2001) or co-evolutionarily via their 'recursive interaction' with physical places (Monge and Contractor, 2003).

Whilst previously, some physical places could have existed in relative isolation, due to the effects of increasing global trade and facilitated by new information and communication technologies, this is increasingly no longer feasible nor desirable. Social and economic actors who are not physically present in a locality now have as much influence on events taking place there as those who are.

6.2 Telecoms in the Reconfiguration of Distance

Swyngedouw (1993) illustrates how telecommunications have become interwoven in the development of new geographical landscapes of production, consumption and distribution. According to him, the need to integrate dispersed areas of production, consumption and exchange into coherent economic systems creates tensions that can only be resolved by the control of space. This control is achieved through the construction of transport and telecoms infrastructures that are used to link production sites, distribution facilities and consumption spaces together.

As the market develops, the need to further interlink new areas of production, consumption and distribution, results in the construction and reconfiguration of more transport and telecommunications infrastructure. The result is an ever changing landscape of communications infrastructures

and the spatial (physical) arrangements of trade (i.e. production, consumption and distribution).

Unpacking these relationships between communications and spatial networks at a micro-level reveals some of the economic and social effects of new technologies (Dierkes, 1998). These include the way in which technologies interrelate with and influence economic organisations, the groups or areas that benefit from their effects and those that loose out, and the growth and demises of power relationships between economic entities.

New technologies (including telecommunications) can therefore bring about *new* challenges to trade and create and/or reinforce non-geographically defined 'frictions of distance'. All this emphasises the need for a specialist to mediate contact between trading partners; and the manner in which intermediation is able to achieve this is discussed below.

7 The Role of Intermediary's in the Management of Distance

Matching of demand and supply is an important aspect of intermediation (see section 5.1) and the greater the benefits of accurate and speedy matching are; the greater is the opportunity for intermediation (Spulber, 1998).

Matching however involves at least two major cost areas: the cost of communicating demand for and availability of goods for sale; and the cost of transporting goods between buyers and sellers. Geography, in the form of distance, impacts these two cost areas with each generally increasing as distance increases. Where communication and transportation costs are prohibitively high, trade will not take place. Economic entities therefore adopt ways to lessen their impact.

7.1 Geographically Hierarchical Markets

When communication costs are high, it is often advantageous to physically bring products to markets to trade. This eliminates the need for lengthy demand specifications, negotiations can be conducted face-to-face, and products can be inspected at first hand thus facilitating quality assurance.

Additionally, when small quantities of goods are involved (and distance between the seller and market is small), the cost of transporting the goods to market and then from the market to the buyer's address is not much greater than the cost of delivering them direct from seller to buyer. One trip to and from the market is normally sufficient for each trader, and the fixed cost of this single trip is spread across all the goods involved.

Bringing goods to market however causes a geographical hierarchy of markets to emerge. This is because transport costs are reduced if demand and supply are (wherever possible) balanced out on a local basis. Thus only net surpluses (goods that are not sold at the local market) are exported to outside markets and only net deficits are met by imports. These surpluses and deficits are cleared at regional markets higher up the geographical scale (Casson, 1997).

Where large quantities of goods are being traded; it is usually cheaper to deliver direct from seller to buyer. In such cases the market becomes an avenue to negotiate contracts between traders using samples or written and/or graphic descriptions. Whilst goods are no longer brought to market, the hierarchical structure of markets may still exist. This is because the balancing of demand and supply are still carried out at both local and regional levels albeit by different, distinct groups of people.

Furthermore, there are advantages in exploring local opportunities for trade before inter-regional ones. In order to minimise the cost of searching for a product/service or buyer, local options (requiring local cheaper information) are first examined and search is only extended to other geographic locations if difficulties are encountered in finding a satisfactory local partner (see Figure 23).

(Casson, 1997)

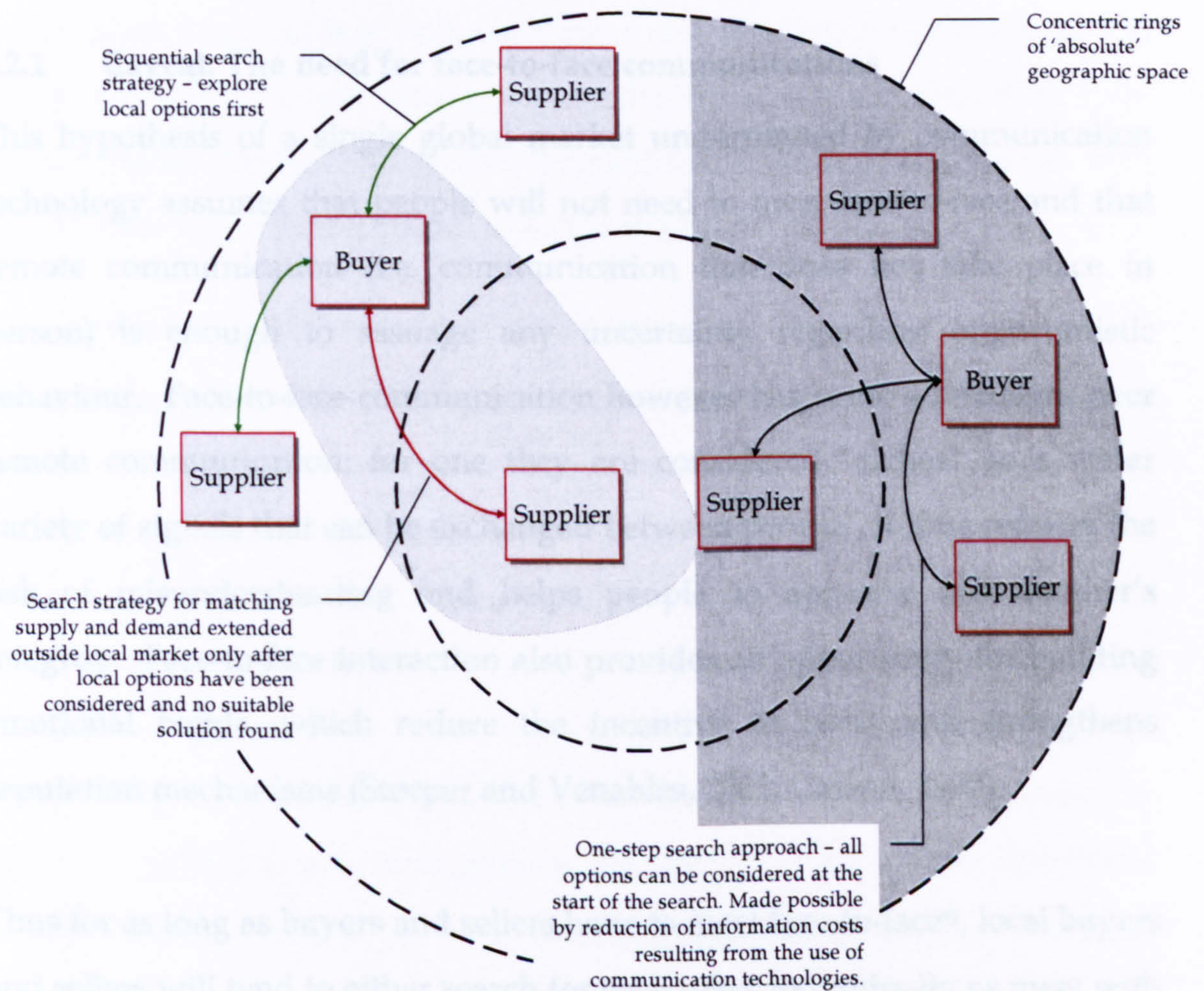


Figure 23: Search strategies in matching demand and supply

7.2 The Impact of Telecommunications on Search Strategy

Telecommunication technologies have reduced information costs in both local and regional markets and as a result, the difference between a

sequential search strategy²⁹ and a single step search strategy³⁰ has also reduced.

Continuous reductions in this differential in cost imply a potential collapse in geographically distinct markets and the emergence of a single global market in which all potential trade partners communicate directly with each other (Casson, 1997).

7.2.1 Caveat: The need for face-to-face communications

This hypothesis of a single global market underpinned by communication technology assumes that people will not need to meet face-to-face and that remote communication (i.e. communication that does not take place in person) is enough to assuage any uncertainty regarding opportunistic behaviour. Face-to-face communication however has some advantages over remote communication; for one they are considered "richer" as a wider variety of signals that can be exchanged between people. It thus reduces the risk of misunderstanding and helps people to appraise one another's integrity. Face-to-face interaction also provides an opportunity for building emotional bonds, which reduce the incentive to cheat and strengthens reputation mechanisms (Storper and Venables, 2003; Casson, 1997).

Thus for as long as buyers and sellers have to meet face-to-face³¹, local buyers and sellers will tend to either search for each other individually or meet with local intermediaries who act as central points for the coordination of the actions of buyers and sellers. When local buyers cannot be matched to local sellers, these intermediaries utilise regional networks and interact either with

²⁹ In sequential search, local options are first examined before regional alternatives

³⁰ In single step strategy all potential ways of matching up peoples' needs are investigated at the outset

³¹ Storper and Venables (2003) identify this as environments where information is imperfect, rapidly changing, and not easily codified.

other intermediaries or directly with sellers from these regions to fulfil their needs. This arrangement economises both on time and transactions costs of both all the entities involved.

As such, in practice, a mixed structure combining systems of communication and market hierarchy is seen to evolve. In this structure, we find intermediaries employing both face-to-face interactions and communication technologies when dealing with each other and with buyers and sellers. We also however find buyers and sellers preferring to consult with their local intermediaries through face-to-face interactions. These buyers/sellers then rely on their local intermediaries to access regional markets/networks.

7.3 Summary of the Role of Intermediaries

Intermediaries are therefore relevant in lessening the impact of both distance and information costs on trade. They provide ways of economising on transportation and communication costs, and proffer solutions to information asymmetries. Intermediaries are however also guilty of retaining and manipulating information to propagate and strengthen their position in the market. But because they make their income from maintaining a stable environment for trade, they have a high incentive to behave in ways that is advantageous to the market. It is therefore anticipated that in markets where information costs are high and geography has strong effects, intermediaries will be key entities in economic organisation.

Furthermore, where communication technologies are present, it is anticipated that these intermediaries will utilize them in managing information asymmetries, lessening the impact of distance, and decreasing the cost of communication. This may result in the emergence of geographically tiered organisations of trade.

8 Analysing the Impact of Telecoms on Organisations

The sections above have shown that information imperfections and the costs created by them are accentuated by distance. The sections also identified economic organisations as mechanisms by which costs and distance are managed either through the physical movement of individuals and goods, or through the application of technology.

Organisations continuously look for ways to manage costs and distance and this result in repeated modifications to the way in which they conduct trade and the environment they can conduct trade in. Better management of cost and distance results in increases in the geographic scope of markets – this result in different strata in the market hierarchy as well as various geographic regions losing and gaining prominence. The different economic entities that make up the organisation are also altered. Their trading preferences change as do the allocation of roles; some roles become redundant whilst others increase in importance. The overall outcome is the emergence of a new structure which requires modified or new forms of coordination and for which either new communication technologies are developed or new applications to existing technologies adopted.

8.1 Impact on Economic Organisations

Economic organisations are the basis of this research, and in particular the conditions under which one form is seen to emerge from another. The assumption here is that competition between alternative economic organisations will in the long run select the most efficient arrangement. The role of telecommunications in providing opportunities for increased efficiency and the responses of organisational arrangements in taking advantage of such opportunities is of particular interest to this thesis. Also of interest is the inability of some economic forms to adapt in the presence of such opportunities. A comparison of these phenomena – i.e. the rise and

demise of economic organisations in response to opportunities presented by telecommunications – provides an opportunity to study the interaction between telecoms and economic growth.

8.2 Use by Intermediaries: The Means to Studying Impact on Organisations

The types of information imperfections that are present in the market determine the intermediation activities that can be observed (see section 5). The study of intermediaries in organisations and in particular their use of telecoms to address information imperfections and coordinate activities therefore provides a way of assessing (a) the impact information has on structure, (b) the efficiency of the adopted structure in addressing the impact of information imperfections, and (c) the contribution of telecoms in achieving such efficiencies.

8.3 Geographic Hierarchy: The Means of Studying Intermediation

Telecoms ultimately results in decreases in communication and transportation costs (see section 7.2), and this has a geographic impact on the economic organisations observed in the industry. Progress towards the emergence of geographically tiered organisations of trade – in which traders and buyers access a ‘global market place’ via the intermediaries they transact with at the local level – is therefore indicative of a prominent role of intermediary structure and the effective use of telecoms.

9 Conclusions

This chapter began with a review of studies on the relationship between telecommunications and economic growth at micro-levels. The impact telecom is reported to have on the performance of small and medium sized enterprises, and on households and microenterprises in developing countries were presented and discussed. It was concluded that whilst more studies at this level of analysis are very much needed, the evidence to date indicates

that the main contribution telecoms makes to the performance of these units is in reducing the communication and transportation costs. Yet even when these businesses and households acknowledged this contribution made by telecoms, its adoption and use for business purposes is neither widespread nor frequent.

The rest of the chapter was therefore spent developing, with reference to relevant literature, a theoretic foundation upon which the adoption and use of telecoms by economic entities can be studied. The demand for telecoms is treated as deriving from a demand for information (Lamberton, 1997) and the theoretic foundation presented in this chapter was developed from the starting point of information (or rather the lack of it) and the impact it has on the way in which trade is organised. The manner in which distance exacerbates the effect of information on organisations was also discussed. Intermediaries were introduced as a way in which organisations manage both the need for information and the effect of distance; and the theoretic foundation ends with a discussion of the possible contribution of telecoms to the effective functioning of intermediaries.

Having established a theoretic foundation, the chapter ends by summarising how the impact of telecoms on economic organisations may be analysed. This thesis now proceeds by presenting (in the next chapter) the conceptual framework used in examining the adoption and use of telecoms for business purposes, and the impact such use has on economic organisation.

Chapter 4 Conceptual Framework

1 Introduction

A conceptual framework is a representation, either graphically or in narrative form, of the main concepts or variables, and their presumed relationship with each other. (Punch 1998, p. 56)

This chapter presents the conceptual framework used by this research in examining the impact of telecoms on economic organisations. This framework originates from theory and (as stated in the quote above) is an amalgamation of the key concepts or variables that are relevant to this research. These concepts and variables were illustrated in the influence diagram that was developed as a result of the review of literature (see Attachment 1 of Chapter 2). The concepts and variables were further defined and described in the theoretic background provided in Chapter 3. They include: (a) information, its impact on (b) economic organisation, and the use of (c) telecommunications in managing this impact.

The way in which telecoms is thought to manage this impact of information on economic organisation is summarised in Figure 24. This diagram is presented and discussed in section 2 to provide context prior to elaborating on the conceptual framework. Section 3 summarises the relevant theories and discussions in literature of each of the key concepts and variables contained in the framework (i.e. information, economic organisation, and telecommunication). The framework itself is presented and discussed in section 4; it examines the interrelationships between its concepts and variables and how they can be investigated; it therefore helps to clarify and focus the objectives of the research. Section 5 lists out and describes the research suppositions that arise from the conceptual framework.

2 The Influence of Telecoms on Economic Organisation

Starting with “use of telecom” (and moving downwards and clockwise), Figure 24 indicates that telecom use results in the more efficient organisation of economic activity (Chowdhury and Wolf, 2003; Dutta, 2001; Beede and Montes, 1997; Saunders et al., 1994). The increase in organisational efficiency is reflected as an increase in the ability of industry participants to cope with the demands of trade (Keating, 2001). An increase in organisational efficiency therefore suggests an increased ability to support higher levels of trade.

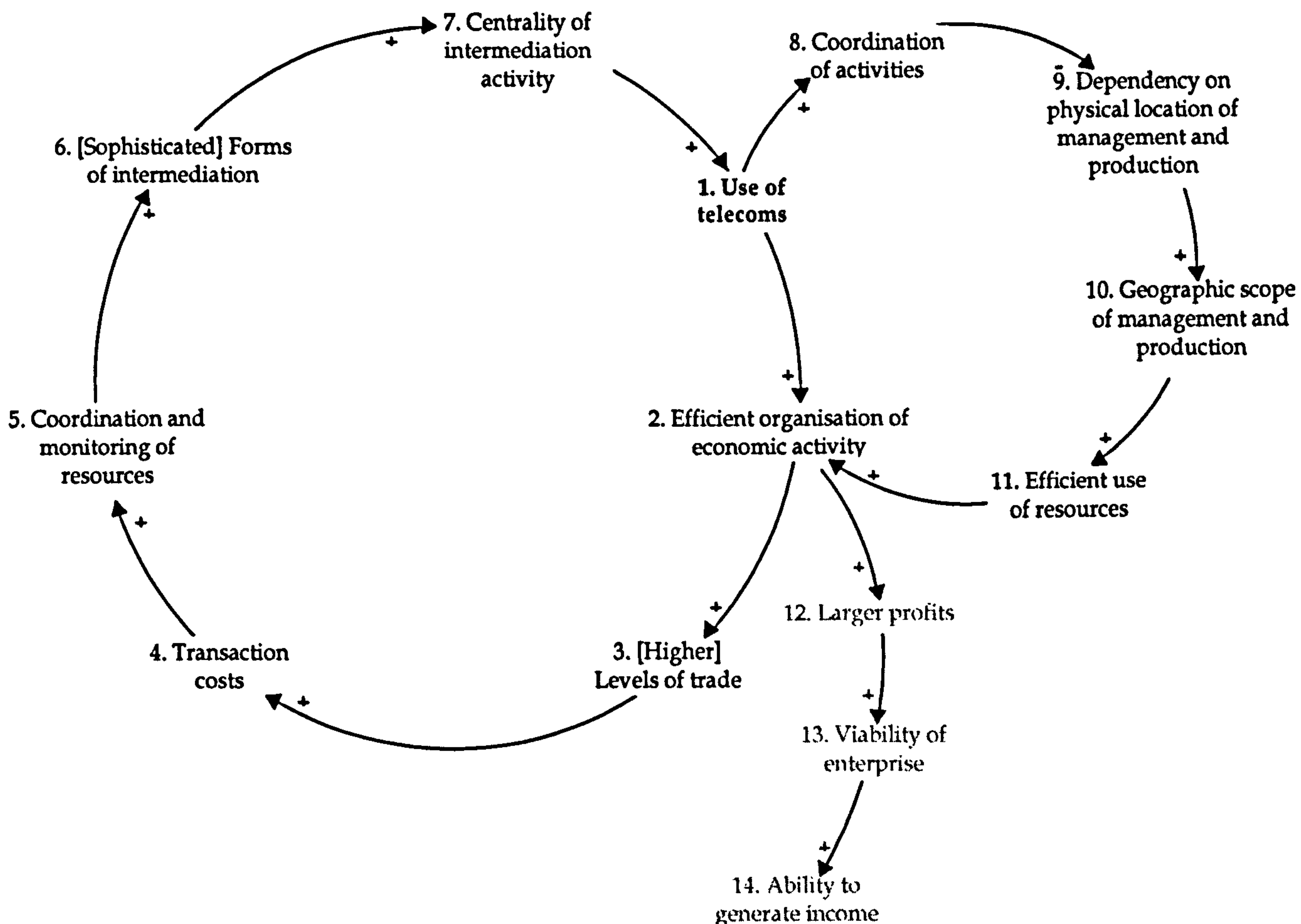


Figure 24: Relationships between concepts and variables of the conceptual framework

Higher levels of trade as well as increasing the profit and/or income accruing to a business also results in an increase in costs as more transactions are being performed. This increase in transaction costs provides the impetus for better and more cost effective ways of utilizing the business' resources

(Foss, 1997). This can be achieved through greater coordination and monitoring of resources, and leads to new and/or more sophisticated forms of intermediation (Spulber, 1998).

Greater and/or enhanced intermediation in turn impacts the organisational structure of the industry, promoting the intermediary as a central, interconnecting entity around which economic activity aggregates (Spulber, 1998; Casson, 1997).

Telecom use supports the intermediation function principally by strengthening coordination capabilities in that it facilitates the allocation of production, distribution, and management activities between the most cost-effective and/or appropriate members of an organisation (Kirkman et al., 2002; Bedi, 1999 and references therein). This allows for optimum resource allocation whilst simultaneously enabling the effective coordination of these activities. Telecoms therefore weakens or breaks an organisation's reliance on geographically co-locating management and production activities (Nadiri and Nandi, 2003); and by enlarging the geographic scope of production and management it increase the efficiency of resource allocation.

This choice in geographic location and structuring of economic entities ensures that it is the more viable organisational form that prevails in the industry. This form of organisation would be able to support higher levels of trade than its predecessor and the cycle again repeats itself. This cycle is not however infinitely positive and the benefits emanating from better coordination need to be weighed against the economic costs of attaining higher levels of coordination. The cycle therefore repeats itself until an organisational structure that is appropriate in light of the relevant coordination costs is obtained.

In summary, telecom increases what organisations are capable of achieving, and presents opportunities for increased levels of trade and profitability. Increased profitability facilitates the viability of the enterprise and the continuing ability of its participants to generate income. The assertion that telecoms results in increased ability to generate income (by way of increased profitability) is de-emphasised and presented in grey font as it is beyond the scope of this thesis. Conclusions about such ability would therefore be anecdotal and not based on the findings of the research.

3 Concepts and Variables of the Conceptual Framework

3.1 The Organisation of Economic Activity

Within the context of this thesis, the term *economic activity* refers to processes that bring about the creation and management of material wealth by a business enterprise. These processes are coordinated and conducted within structures (of varying complexities) called organisations. An *organisation*, within the context of this thesis, refers to a grouping of people for a defined purpose and time duration, either formally through binding contracts or informally through shared understanding (Ricketts, 2002). These groups cooperate systematically to conduct business, and have functions that contribute to the whole organisation, as well as to collective functions.

Skills and competencies are dispersed in an organisation and as such interaction and coordination between members is critical to the efficient conduct of business. Such interactions and coordination occur in discernable patterns that can be used to describe the structural form of the organisation.

3.2 Information Needs: Telecommunications as a Communication Network

A key impetus for the formation of organisations is information (Lamberton, 1998a). The operation of any market requires participants in the market to

make decisions on the basis of the information available to them. However information imperfections (i.e. situations in which parties to a transaction do not have enough information to act in their own best interest) always exist and decisions tend to be made under “bounded rationality” (Williamson, 1981) or conditions of uncertainty. Increasing the amount and quality of information available so as to make better decisions comes at a price and contributes to the overall cost of business transactions. There is, therefore, an incentive for businesses to reduce information and transaction costs, and this provides the rationale for “collective action” through the formation of organisations (Williamson, 1975; Arrow, 1974 and 1979; Radner, 1986 as cited in Monk, 1989).

Both the production and distribution of information is required for the efficient organisation of trade, and as such communication or transmission of information cannot be separated from its production and use in the economy (Monk, 1989). A telecommunications network can therefore be defined as an information infrastructure that facilitates the efficiency with which information is acquired and spread. Telecoms improve communication within and between organisations and these improvements translate into increases in organisational efficiency, and strengthen the abilities of businesses to support higher levels of economic activity.

Thus, in an economic sense, the demand for telecoms can be analysed as being derived from a demand for information (Lamberton, 1998b), and more specifically, a demand for a more efficient means of acquiring and distributing information.

3.3 Changes in the Structure of Economic Organisation

Economic organisations employ a variety of methods to economise on information cost. As a result of the environment in which this research was

conducted³², this thesis highlights the use of communication technologies - in particular telephones - to economise on costs. Different forms of telephones exist in this environment and were namely landlines, mobile and payphones. Different types of access to telephones also exist - personal ownership and public access. Mobile telephones and public access through phone shops were by far the most ubiquitous means by which the study sample made use of communication technologies³³.

Furthermore, this thesis adopts a co-evolutionary (rather than a deterministic) interpretation of the impact of communication technologies on economic organisation (Graham, 1998; Swyngedouw, 1993). This interpretation emphasises the interaction between communication technologies and economic organisation and how each adapts to and causes changes in the other.

By improving upon the ability to economise on information costs, telephones reduce the cost of addressing information imperfections and create a more 'level playing field' for participants in the market. The initial impact of improved communication is usually a greater speed of transactions rather than lower cost³⁴, however, as market growth facilitates additional entry, or regulation imposes price cuts, the full impact of lower information costs will begin to accrue to the market. When this happens, a new environment - or 'playing field' is created and the quest for even greater efficiency drives the supply of better communication technologies.

³² This research was conducted within the informal sector of a developing country, namely Nigeria.

³³ The different types of access to telephones that are available to the participants of the study are described in further detail in Chapter 7.

³⁴ This is because the sunk costs of providing the infrastructure must first be recovered.

The variation in access to telephones by the organisations that are the focus of this research is thus expected to result in different types of organising structures coexisting at any given point in time. These different forms will differ in the way they economise on information cost. One of the aims of this research is to determine if access to telephones contributes to this difference.

3.3.1 The function of intermediaries in organisations

Section 3.2 identified information as a key impetus for the formation of organisations and telecoms as an enabling tool for efficient organisation (via its potential to make information more readily available). However, there is a dimension to information that limits the efficiency contributions that can be ascribed to the mere use of telephones. This dimension is that information is not just data, but data that has been ordered or 'arranged so it makes a difference to what we do' (Wildarsky, 1983, p. 30). In some circumstances then, information must be accompanied by competence for it to be effective and this has little to do with the tool by which the information is transmitted.

Differences in the competence to use information exist in markets and some participants are better able to utilise it to their advantage than others. A distinction can therefore be made between value in the *use of information* and value in the *exchange of information*. The exchange of information has to occur prior to its use, and whilst telecom (as a communication infrastructure) directly contributes to the exchange of information its contribution to the use of information is at best indirectly.

There is a need to analyse the impact of telecoms at a more detailed level than the organisational level or form. The purposes for which entities that make up an organisation use the technology and the impact such use has on reducing information uncertainties and costs associated with getting and distributing information must also be investigated. This research achieves

this by analysing the function of intermediaries in organisations and their use of telephones. Intermediaries were selected for analysis because their existence is primarily as a result of information imperfections in markets. Their activities provide a good basis for analysis.

4 Conceptual Framework

The manner in which the interrelationships between economic organisation, telecommunications, information, and intermediation fit together in the context of this thesis is represented by Figure 25. The block arrow in the background emphasises that the framework should be read from the bottom left-hand corner of the page, to the top right-hand corner of the page. This flow is further emphasised by the “start” at the variable “Telecom use” and the “end” at “Ability to generate income”. Three dots [...] are used to summarise the phrase “in terms of” and should be read as such. In the description that follows, the concepts and variables of the framework appear in *Italics*, and the manner in which they relate to one another is explained.

This research investigated the impact *telecom use* has on *information imperfection*, and as telephones have also been reported in literature to contribute towards reducing the impact distance has on trade (Mitchell, 1999), the research also investigates the impact telephones have on the *geographic location of production and demand*. This analysis on geography is however restricted to instances or conditions where geography contributes to information imperfections.

Information is costly to obtain (requiring substantial time, effort and financial commitments) and is influential in determining how economic organisations are structured. The *structure of organisations* in an industry can therefore be interpreted as rational responses to the need to economise on information costs (Casson, 1997). These “rational responses” include the adoption of

intermediary activity and the research analyses the impact information imperfections have on structure of organisations, primarily through the *intermediary activity* they give rise to. In the framework, organisational structure is described in terms of the way trade is organised and the role(s) played by participants of trade.

An increased capacity to economise on information costs is anticipated to result in positive *outcomes on trade* including increases in revenue generating ability and cost saving agility. These outcomes constitute benefits that accrue to different participants or roles in varying proportions. However, as the benefits manifest and become associated with specific participants or roles their position will become more attractive and other players in the industry will seek to emulate them (identified in the framework as *attractiveness of certain roles*). This will give rise to changes in the way participants perform their roles (and maybe even in the roles they undertake) that will in turn impact on structure of organisation in the industry.

The temporal characteristic of the conceptual framework needs to be highlighted at this point. Whilst all the concepts and variables described so far can be assessed at fixed points in time, the ability of participants to emulate behaviour and or adopt new roles changes over time periods. Due to resources constraints – both financial and time, this research is not a longitudinal study and as such the part of the framework dealing with behaviour over time has not been assessed (and is therefore de-emphasised by being presented in grey font). Likewise, due to the same constraints, the increased ability to generate income that could be associated with having improved “revenue generating ability and cost saving agility”, can also only be inferred by this research and not empirically measured. As a result, this too has been de-emphasised in the framework.

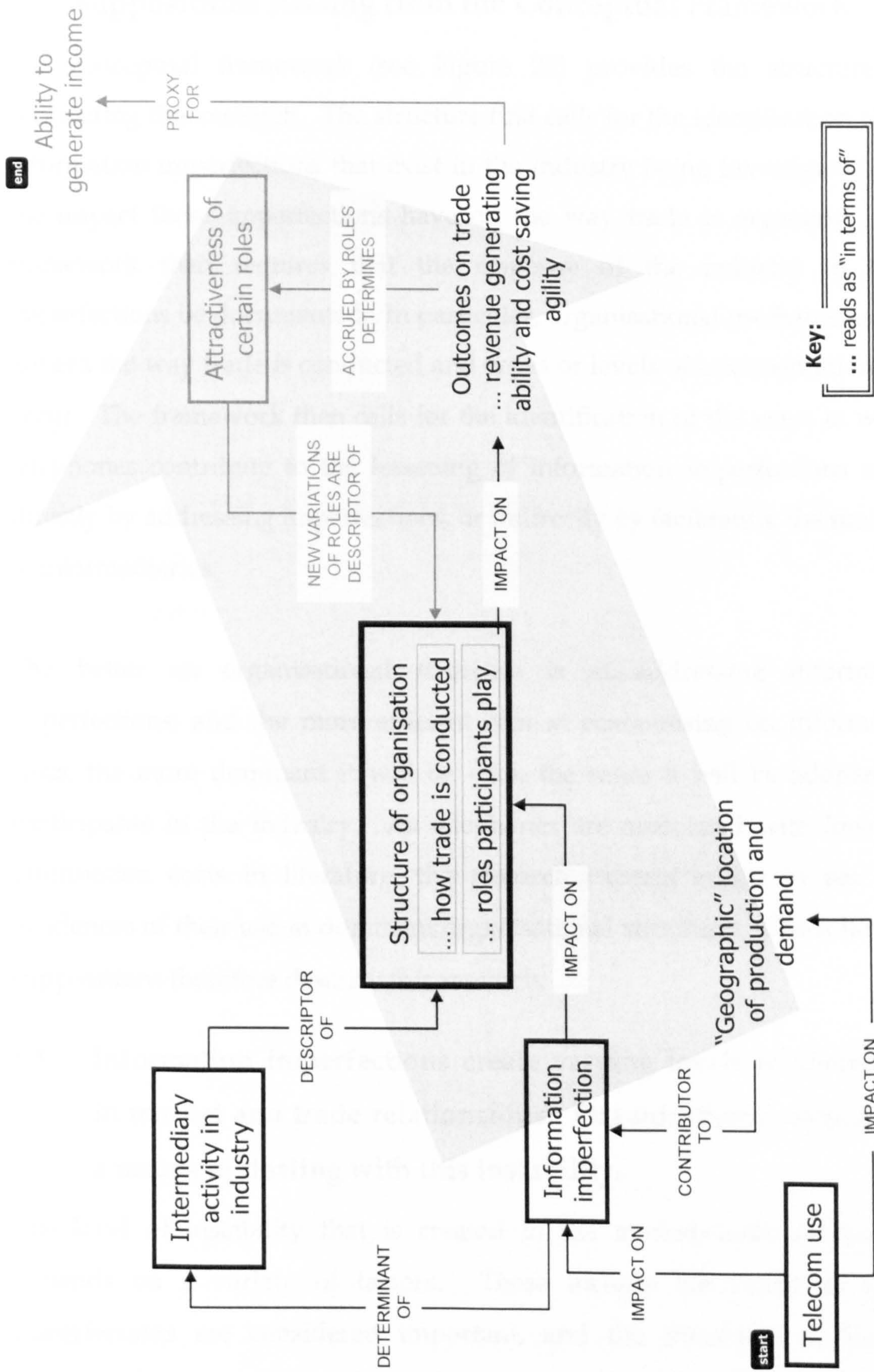


Figure 25: Conceptual Framework

5 Suppositions Arising from the Conceptual Framework

The conceptual framework (see Figure 25) provides the structure for conducting this research. The structure first calls for the identification of the information imperfections that exist in the industry being investigated, and the impact these imperfections have on the way trade is organised. The framework then requires that the response of the industry to these imperfections be documented. In particular, organisational mechanisms that govern the way trade is conducted and types or levels of intermediation that occur. The framework then calls for the identification of the ways in which telephones contribute to the lessening of information imperfections either directly by addressing imperfections, or indirectly by facilitating the function of intermediaries.

The better an organisational structure is at addressing information imperfections, and the more efficient it is at economising on information costs, the more dominant it will be – i.e. the more it will be adopted by participants in the industry. As telephones are associated with lowering information costs in literature, the research expects to see high incidences of their use in dominant organisational structures. The following suppositions therefore describe this research:

5.1 Information imperfections create varying levels of instability in market and trade relationships. Organisational structure is a means of dealing with this instability.

The level of instability that is created in the market/trade relationship depends on a variety of factors. These include the extent to which imperfections are considered important, and the threshold or level of tolerance for instability exhibited by parties to the trade. These factors will encourage the adoption of some form of structure through which the

instability can be managed. The structure is however created at some economic cost.

Information imperfections, and ability to economise on the cost of obtaining information therefore lie at the heart of the creation of structure or (as termed in this thesis) - economic organisations. However, that a structure exists does not mean that information imperfections no longer exist; on the contrary, it is the continuing existence of such imperfections and the development of new tools and techniques to control them that generate changes (or brings about evolution) in structure.

5.2 The types of information imperfections that are present in the market determine the intermediation activities that can be observed.

In general, when demand and supply occur at differing levels, intermediaries help to address the situation by standing ready to buy and sell. When there is uncertainty about the willingness of buyers to pay or opportunistic costs of suppliers, intermediaries coordinate transactions via matchmaking and brokering activities. Intermediaries also generate market information and provide guaranties for product quality when the characteristics of buyers and sellers are difficult to observable.

Furthermore, because intermediaries trade in higher volumes than individual customers, they engage in trade with a variety of suppliers. They therefore build up an awareness of quality through experience and can provide guarantees for the information they provide, backing this up with either reputation and/or binding contracts. Finally, when the actions of buyers and sellers are difficult and costly to observe, intermediaries provide monitoring and contracting services.

5.3 Economic entities tend to always adopt the least cost structure (and/or mechanism) of conducting trade.

Economic entities will utilise the services of intermediaries when they are less costly than other alternatives (for example dealing directly with each other through decentralised exchanges). There is therefore competition between organisational structures that incorporate intermediation and those that do not. Competition also exists between different forms of intermediary structures based on their abilities to economise on information costs.

Organisational structures will therefore continually look for ways - including adopting technology - to improve their cost economising abilities. As a result of this competition, structures that are most efficient at economising on information costs will be the dominant form in the industry.

5.4 Telecommunications is a tool that is utilised in the reduction of information cost and will as such be adopted by surviving/dominant structures.

"An efficient economy achieves a given degree of coordination of material goods and services at minimum information cost. To minimize information costs, coordination of information flows is in turn required." (Casson, 1997, p. 36).

Coordination requires considerable information; and because many different aspects of information are required for coordination, a fairly modest cost of information per unit can result in the overall cost of coordination being very high. Telecommunications aids in the coordination of information flows by facilitating a reduction in the cost of obtaining and distributing information. It therefore improves communication between economic entities, and aids in the acquisition of information about new opportunities. The improvements in communication translate into reduced information costs and lead to increases in the efficiency of the market and trade relationships. Telecommunications also helps to reduce transport costs by substituting for

the need to travel. These savings in cost are not just financial but also include the opportunity cost of engaging in more productive activities.

5.5 Geography has an impact on trade and telecommunications is a tool by which this impact can be managed.

Geography, in the form of physical distance between places, impacts on two major cost areas relating to trade: communication and transportation. In general terms, communication costs refer to those incurred in conveying demand for goods and publicising the availability of goods for sale, whilst transportation costs are those incurred in moving goods between buyers and sellers. As the distance between places increases, each of these costs also tends to increase. Telecoms contribute towards reducing communication and transportation costs and can therefore be used in managing the impact geography has on trade.

6 Relating Suppositions in Conceptual Framework

Each of the suppositions described above can be related to their relevant concepts and variables the conceptual framework (this is illustrated in Figure 27). For example, the supposition - *Information imperfections create varying levels of instability market and trade relationships* - is represented by the segment of the conceptual framework shown below:

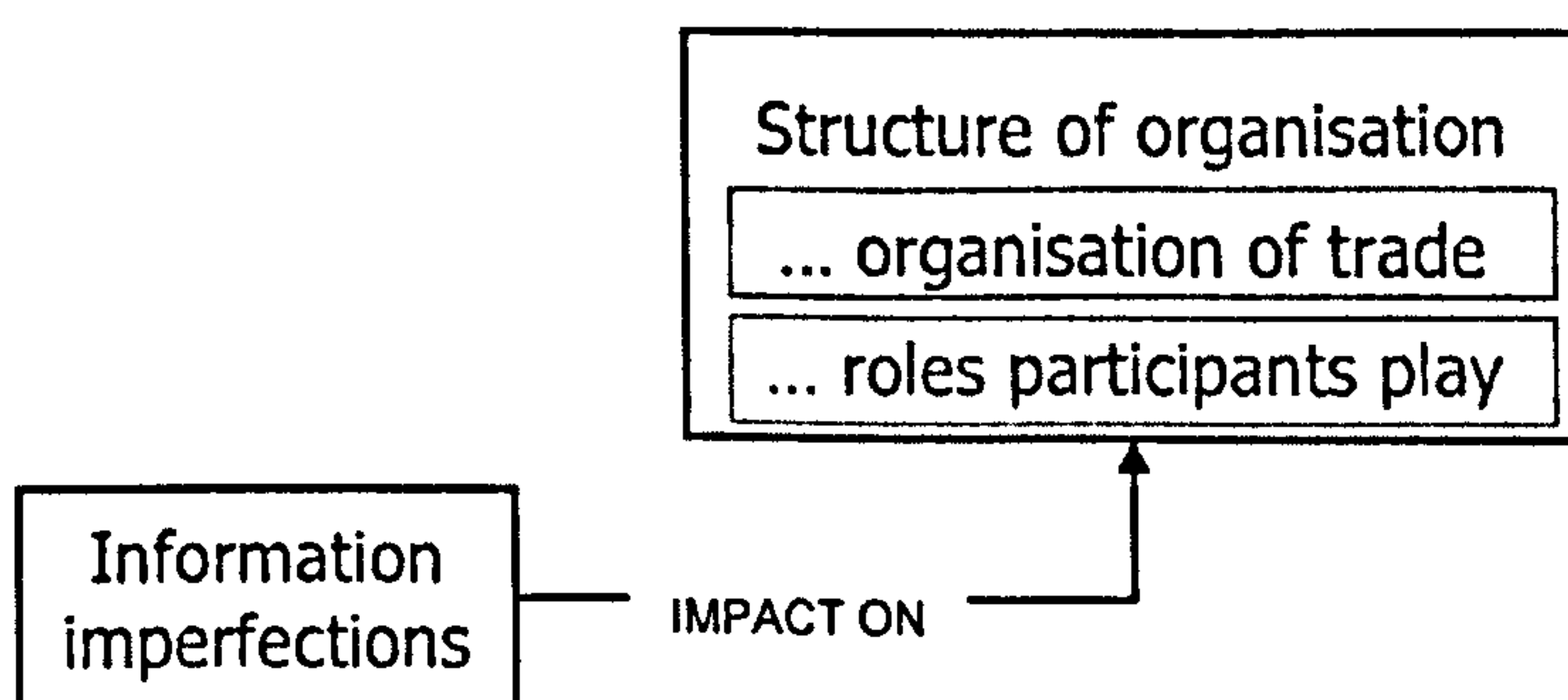


Figure 26: Information imperfection-market instability supposition

Thus according to Figure 26, instability created by imperfect information can be seen expressed in the behaviour of participants in the industry. This

behaviour can be investigated in terms of the roles played by participants during trade and how their trade (and trade relationships) are organised. This mapping of the suppositions to the conceptual framework provides the structure for analysing the research data.

7 Conclusion: Inferences Arising from the Conceptual Framework

This chapter presented and discussed the conceptual framework of the thesis. This framework presented the interrelationships between economic organisation, telecommunications, information and intermediation. It discusses how these interrelationships can be investigated and therefore helps to clarify and focus the objectives of the research. The chapter also presents and discusses the suppositions of the thesis. These suppositions focus on the structural forms within which trade takes place, the impact of information imperfections on such structures (and by extension on trade), the role of intermediation in addressing such imperfections, and the ways in which telecommunications facilitates this role.

Given the thesis' focus on the role of telecommunications, the following inferences can be drawn from the suppositions listed in section 5.

- a. Firstly, members of an industry that do not have access to telecommunication are locked into sub-optimal economic organisations and suffer developmentally in terms of the economic returns accruing to them from their trade.
- b. Secondly, in circumstances where the dominant organisational structures in the industry do not have access to the economising advantages of telecoms, the industry as a whole suffers by not achieving its development potential.

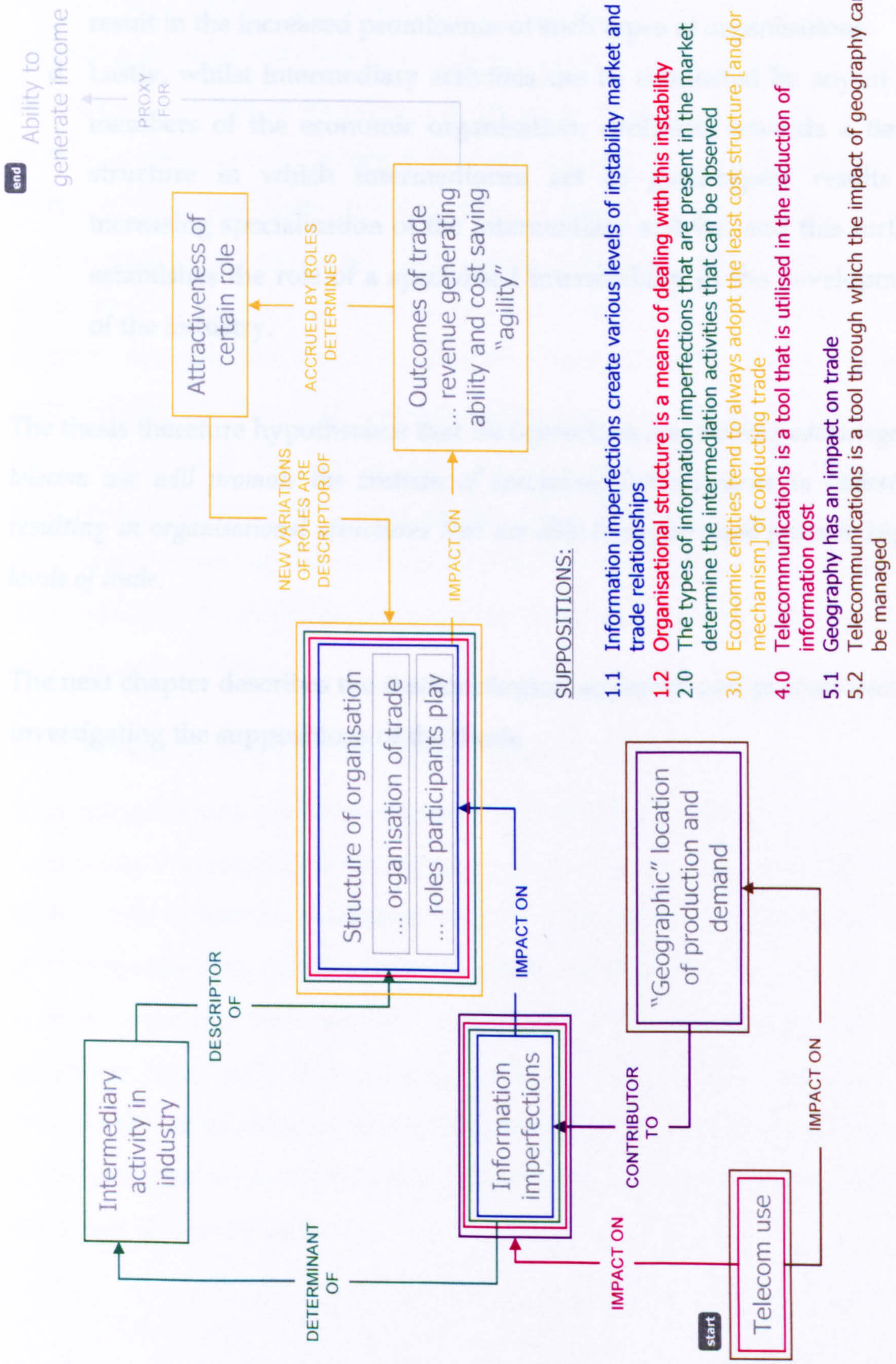


Figure 27: Conceptual framework with suppositions highlighted

- c. Thirdly, members of an industry without access to telecommunications can gain from its economising advantages by joining economic organisations with access to telecoms; and this will result in the increased prominence of such types of organisations.
- d. Lastly, whilst intermediary activities can be conducted by any of the members of the economic organisation, evolution towards a tiered structure in which intermediaries act as gatekeepers results in increasing specialisation of the intermediary activity, and this further establishes the role of a specialised intermediary in the development of the industry.

The thesis therefore hypothesises that *the information economising advantages of telecom use will promote the creation of specialised intermediaries in industries resulting in organisational structures that are able to support and promote higher levels of trade.*

The next chapter describes the methodological approach and process used in investigating the suppositions of the thesis.

Chapter 5 Research Methodology

1 Introduction

The previous chapter presented the conceptual framework of the thesis. According to Miles and Huberman (1984) conceptual frameworks explain the key factors, concepts or variables that are to be studied. They are the means by which researchers formulate what may be going on with the phenomena being studied and these frameworks are tentative theories of what is happening and why (Maxwell, 1996). Conceptual frameworks therefore help researchers to assess the purpose of their study, to develop and select realistic and relevant research questions and methods, and to identify potential validity threats to research conclusions. It is to these elements of the research that the thesis now turns. This chapter discusses the methodology adopted in conducting this research; it describes the design of the research including the methods adopted for data collection and analysis, and highlights the steps taken against identified threats to the validity of the selected methodology.

2 Research Hypothesis and Suppositions

Research questions (i.e. what a researcher specifically wants to answer by conducting the research) serve as guides to where data can be found (Chenail, 2000). This research contributes towards answering the question of how telecommunications contributes to economic development. This is however a broad question that requires re-defining into more researchable sub-questions. As such this research looks at a particular aspect of the contribution of telecoms to economic development by describing the impact a specific type of the technology - telephones, has on the way trade is organised and accomplished.

In order to do this, suppositions emanating from a review of theoretic concepts relating to the organisation of trade and use of communication technologies were generated and an overriding research hypothesis developed. This review of theory is discussed in Chapter 3 and the suppositions arising from it in Chapter 4. The hypothesis of this research is that:

The information economising advantages of telecom use will promote the creation of specialised intermediaries in industries resulting in organisational structures that are able to support and promote higher levels of trade.

2.1 Hypotheses in Qualitative Research

Research questions and research hypotheses do not refer to the same thing; whilst research questions state what the researcher is interested in learning from the study, hypotheses are statements that are tentative answers to research questions. They are implications of theory or experience (Maxwell, 2005); or the explicit ideas a researcher has about what might be taking place in the study (Miles and Huberman, 1994).

As discussed in the literature review (Chapter 2), a number of studies have been conducted on the relationship between telecommunications and development which suggest how telecoms might be influencing economic growth. Some of these suggestions relate to the impact telecom might be having on information. Telecoms is said to facilitate the development, acquisition, and distribution of information in ways that result in reductions in the cost of trade transactions, and increases in business efficiency. The role information plays in the organisation and process of trade is well documented and grounded in a 'rich' theoretic background³⁵. This thesis was therefore able to formulate (in Chapter 4) suppositions and an overriding

³⁵ For example aspects of Economics that study the impact information has on markets, organisations, and decision making.

research hypothesis that are based on theory and evidence provided by prior research.

Hypotheses in quantitative research differ in key ways from those found in qualitative research. Maxwell (2005, p. 69) hinges this difference on the timing of formulation, noting that in qualitative research hypotheses are formulated after the researcher has begun the study. As such, they can be described as being “grounded” (Glaser and Strauss, 1967) in data and are developed and tested in interaction with data.

Quantitative hypotheses on the other hand are developed before the study begins, and are prior ideas that are tested against the data. Thus unless a hypothesis is framed in advance of data collection quantitative researchers believe it cannot be legitimately tested by the data as the possibility that the researcher will search through the data to find significant relationships will exist. This search for significant relationships, also known as “fishing” (Maxwell, 2005) is however valid in qualitative research, so long as findings are then tested against new evidence and possible validity threats.

With respect to this research, although hypotheses/suppositions were formulated prior to fieldwork, they were consistently reviewed and tested against data (as it was being collected and analysed). The design of the research process is discussed in the following sections.

3 Design in Qualitative Research: An Iterative Process

Qualitative research design is a continuous and iterative process that involves “tacking” back and forth between the different components of design (Maxwell, 2005³⁶). Rarely is there a predetermined starting point and

³⁶ Although components of the research process differ amongst authors there are some similarities; Maxwell’s (2005) design components include the implications of goals, theories,

the process of design does not proceed sequentially through fixed steps either. It should therefore be noted that the research design presented in this chapter has gone through various revisions to ensure that it is fit for the purpose of the study. The adopted design is a qualitative case study methodology; specifically a single-embedded case study. The data collection methods used were semi-structured interviews, participant observation, and documentation. Data analysis was performed using coding, matrices and causal networks and was supported by a qualitative software analysis package, NVivo. The following sections discuss the theoretical considerations underpinning the design of the research and also describe how design decisions were made.

4 Selecting a Qualitative Approach

According to Creswell (2003) three 'elements of inquiry' combine to determine the approach adopted for a particular research. These are: (i) the *knowledge claims* being made by the researcher, (ii) the general procedures of research that will be adopted – referred to as *strategies of inquiry*, and (iii) the *methods* of data collection and analysis (see Figure 28).

4.1 Knowledge Claims

Knowledge claims refer to the assumptions researchers have about “how they will learn and what they will learn” during their research. They arise from the *paradigm* (or *paradigms*) subscribed to by the researcher. The term *paradigm* derives from the work of Thomas Khun and relates to philosophical assumptions about the nature of the world or reality – ontology, and how it can be understood – epistemology (Maxwell, 2005).

research questions, methods, and validity threats. Creswell (2003) cites questions, theoretical lens, data collection, data analysis, write up, and validation as components of research design. Whilst Yin (1995), specific to case study design, makes mention of questions, propositions (if any), units of analysis, logic linking data to propositions, and criteria for interpreting findings.

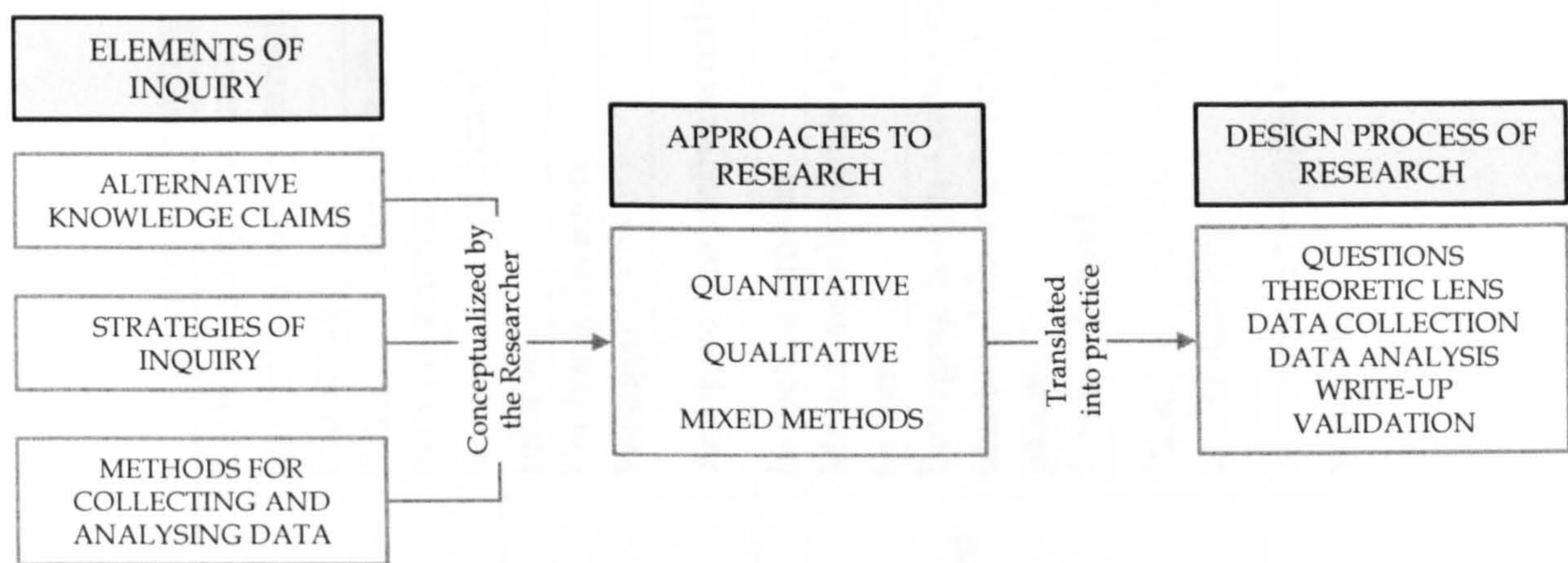


Figure 28: Knowledge Claims, Strategies of Inquiry, and Methods Leading to Approaches and Research Design

Source: Creswell, John W. "Research Design: Qualitative, Quantitative, and Mixed Methods Approaches" Second Edition p.5

Creswell (1994, 1998) further suggest that philosophical assumptions on the role of values in the study - axiology, the language of the research - rhetoric, and the process of the research itself - methodology should also be considered in assessing knowledge claims. Creswell uses all of these philosophical assumptions to create two broad categories of paradigms: the *quantitative paradigm* and the *qualitative paradigm*³⁷.

Table 2 presents a summary of the key differences between the two paradigms. Often cited differences are that under the quantitative paradigm

"...the social world exists externally, and its properties should be measured through objective methods, rather than being inferred subjectively [as under the qualitative paradigm] through sensation, reflection or intuition." (Easterby-Smith et al., 2002, p. 28)

³⁷ This philosophical dichotomy is represented elsewhere in literature; Easterby-Smith et al. (1991) speak of positivism (quantitative) and phenomenology (qualitative); and Miles and Huberman (1994) identify a continuum with postpositivism (quantitative) and relativism (qualitative) at the extremes.

Table 2: Quantitative and Qualitative Paradigm Assumptions

Assumption	Question	Quantitative Paradigm	Qualitative Paradigm
Ontological Assumption	What is the nature of reality?	Reality is objective and singular, apart from the researcher	Reality is subjective and multiple as seen by participants in a study
Epistemological Assumption	What is the relationship of the researcher to the researched?	Researcher is independent from that being researched	Researcher interacts with that being researched
Axiological Assumption	What is the role of values?	Value-free and unbiased	Value-laden and biased
Rhetorical Assumption	What is the language of research?	Formal	Informal
		Based on set definitions	Evolving decisions
		Impersonal voice	Personal Voice
		Use of accepted quantitative words	Accepted qualitative words
Methodological Assumption	What is the process of research?	Deductive process	Inductive process
		Cause and effect	Mutual simultaneous shaping of factors
		Static design-categories isolated before study	Emerging design - categories identified during research process
		Context-free	Context-bound
		Generalizations leading to prediction, explanation, and understanding	Patterns, theories developed for understanding
		Accurate and reliable through validity and reliability	Accurate and reliable through verification

Source: Creswell, John W. (1994) "Research Design: Qualitative & Quantitative Approaches" p.5

The quantitative paradigm thus generates research that is deductive in process whilst research under the qualitative paradigm is described as being inductive. Also, under the quantitative paradigm, the researcher is an objective observer who does not participate in or influence what is being studied. On the other hand in the qualitative paradigm the researcher participates in the study in the belief that recognition of his/her personal ties to the study is a valuable source of insight, theory, and data about the phenomena being investigated (Maxwell, 1996).

This dichotomy of the two paradigms is however broad and general, and whilst a distinction between them can be made at the philosophical level, this demarcation breaks down at the practical level (Easterby-Smith *et al.*, 1991). Few, if any, research activities fit exclusively within each paradigm; rather significant overlaps exist in practice. Furthermore, some researchers deliberately combine methods derived from each paradigm - as noted by Creswell "mixed method research has come of age" (2003, p.4) and other philosophical assumptions have emerged in the discussion of research methodology. Knowledge claims are therefore no longer framed as belonging either to a qualitative paradigm or a quantitative one, but rather measured in terms of *degree*; and classified as being more qualitative or quantitative in nature.

In light of this, the knowledge claim of this research can be described as being qualitative in nature. In studying the role telecoms plays in the economic development of the case industry, the context of the study is of importance. This context refers to the environment and circumstance in which the technology is employed and provides the means by which the results of the research can be understood. Furthermore, understanding of the role of telephones is acquired in an emergent way from the accounts given by various participants in the industry. The research process is

therefore inductive, and findings on how telephones impact on economic development will be subjective as they will be derived from the perspective of multiple participants.

4.2 Strategies of Inquiry

Strategies of inquiry (also referred to as research methodologies by Miles and Huberman, 1994) provide specific direction for the design of the research and guide the *process* a researcher uses to study (or acquire knowledge about) a given phenomenon. Paradigms typically have specific methodological strategies linked to their assumptions and a research's methodology is therefore usually derived from the paradigm it subscribes to (Maxwell, 2005, Easterby-Smith *et al.*, 1991).

Thus (with reference to Table 2) strategies that for example endorse the involvement of the researcher in the study, support the assumption that social phenomena are constantly changing, and are focused on understanding such changes as they occur in their natural context, would be associated with the qualitative paradigm. Examples of such strategies include ethnography, grounded theory, case studies, phenomenological research, and narrative research (Creswell, 2003). This research is qualitative in nature and the strategy of inquiry that was adopted is that of case studies. This methodology and the reasons why it was chosen for this research are discussed in detail in section 6 of this chapter.

4.3 Methods for Collecting and Analysing Data

Creswell (2003) suggests that three "elements of inquiry" be considered when selecting a research approach to apply to a study. The first two elements 'knowledge claims' and 'strategies of inquiry' have been identified and described earlier in this chapter (sections 4.1 and 4.2); the third element

refers to the specific methods to be employed for collecting and analysing the data.

4.3.1 Methods for collecting data

With regard to data collection, Creswell recommends that all feasible methods be considered before a selection is made. He also recommends that selection be based on whether the research specifies the type of information to be collected beforehand, or allows information to emerge during the course of the study. Other characteristics of the research to be considered in making the decision include the degree to which the methods utilise closed-ended versus open-ended questioning, and whether the focus of the research is on numeric rather than non-numeric data analysis.

Various methods exist and again there is overlap in their use by different paradigms. However, methods that are primarily associated with the qualitative paradigm include interviews, observation and diary methods; whilst questionnaires and survey methods are described as being easier to use under the quantitative paradigm (Easterby-Smith *et al.*, 1991).

4.3.2 Methods for analysing data

Qualitative analysis methods include the use of memos, categorizing strategies such as coding and thematic analysis, and connecting strategies such as narrative analysis (Maxwell, 2005). Analysis can be conducted or structured in different ways; Wolcott (1994) groups the process of qualitative data analysis into three major operations: *description* – which focuses on portraying “what’s going on here”, *analysis* – which shows how things work by systematically identifying key factors and relationships, and *interpretation* – that deals with making sense of the meanings in context.

Miles and Huberman (1994) recommend a more deductive process comprised of interwoven analytical steps of (i) data reduction -selecting,

focusing, simplifying, and transforming field notes or transcripts; (ii) data display –that permit the drawing of conclusion and further action; and (iii) conclusion drawing and verification. Analysis in this research was modelled after the Miles and Huberman approach and is discussed in detail in section 9. Analysis was performed using memos, codes, matrices and networks within an iterative framework.

5 Qualitative versus Quantitative versus Mixed Methods

In general, ‘knowledge claims’ made by research, ‘strategies of inquiry’ adopted and methods employed for data collection and analysis, all combine into the conceptualisation of a research approach that can be either qualitative, quantitative or a mixture of both. Although Creswell (2003) clearly distinguishes between research approaches (so as aid decision-making on the most suitable approach for achieving the objectives of a research), he nonetheless cautions against pitching one approach against the other.

As mentioned earlier in this chapter and summarised by a variety of authors, arguments about one method being more superior to another are unproductive (Maxwell, 2005; Miles and Huberman, 1994; Easterby-Smith *et al.*, 1991). Qualitative and quantitative methods are “inextricably intertwined” (Miles and Huberman, 1994) in terms of the specific data sets they deal with (quantitative and qualitative data are, at some level, virtually inseparable), and in terms of the design and analysis of research studies. Furthermore, qualitative and quantitative methods can be (and are) used in conjunction with each other as a mixed-methods approach.

Quoting Salomon (1991), Miles and Huberman emphasise that the distinction between approaches is not one of qualitative versus quantitative but whether “an *analytical* approach to understanding a few controlled variables” is being

adopted as opposed to the research using “a *systemic* approach to understand the interaction of variables in a complex environment.” (1994, p. 41)

Another distinction is that made by Tesch (1994) who notes that strictly speaking, there is no such thing as qualitative research rather only data can be described as being qualitative and to Tesch, the term “Qualitative Research” identifies a particular approach to knowledge production. This view is echoed by Stake (1995) who cites one of the differences between qualitative and quantitative research as being a distinction between knowledge discovered and knowledge constructed.

5.1 When to use a Qualitative Approach

Qualitative research is undertaken in a natural setting in which the researcher is part of the data collection process, and involves the collection of data from multiple sources of information. This data is then analysed inductively (Creswell, 1998 and references therein).

In selecting a research approach there needs to be a match between the problem being investigated and the approach taken. Creswell (1998) advocates adopting a qualitative approach when the problem being investigated is concerned either with identifying the impact of an intervention, factors that influence an outcome, or in understanding the best predictors of outcomes. Maxwell (1996) simplifies this by asserting that the interest in qualitative study lies more in process than in outcomes. He recommends qualitative approaches for identifying the processes that lead to outcomes; processes which experimental and survey research (that are synonymous with quantitative approaches) are often poor at identifying. Miles and Huberman (1984) appear to concur:

“... field research is far better than solely quantified approaches at developing explanation of what we call local causality – the actual

events and processes that led to specific outcomes.” (Miles and Huberman, 1984, p. 132)

This thesis investigates the manner in which telephones impact upon the structural forms within which trade takes place (as a way of understanding the impact of telephones on economic development). Specifically, the research study examines the impact of information imperfections on structures of trade, the role of intermediation in addressing such imperfections, and the way in which telephones are used to facilitate this role. The research is therefore a causal study of the process by which telephones bring about changes in the way trade is conducted, which expectedly (from a review of literature) results in the improvement of the economic development of the trade. This fits in line with the recommendations outlined above and on this basis a qualitative approach was adopted for this research.

5.2 Investigating Causality using Qualitative Research

Causality can be investigated using both quantitative and qualitative approaches. However, Maxwell (2005) emphasises that quantitative and qualitative researchers ask different types of causal questions and that whilst quantitative researchers are interested in knowing whether and to what extent changes in one variable causes changes in another, qualitative researchers focus on the process that connects two variables, and are thus interested in how one variable plays a role in causing another.

Understanding the processes and mechanisms between variables is thus fundamental to causality in qualitative approaches. Using the terms *variance theory* and *process theory* (originally coined by Mohr, 1982), Maxwell explains that questions relating to variance focus on difference and correlation and often begin with “Does”, “How much”, “To what extent”, and “Is there a relationship”. In contrast, process questions focus on how things happen.

They consider how relationships occur, rather than whether a particular relationship exists and by how much it is explained by other variables (see Figure 29 below).

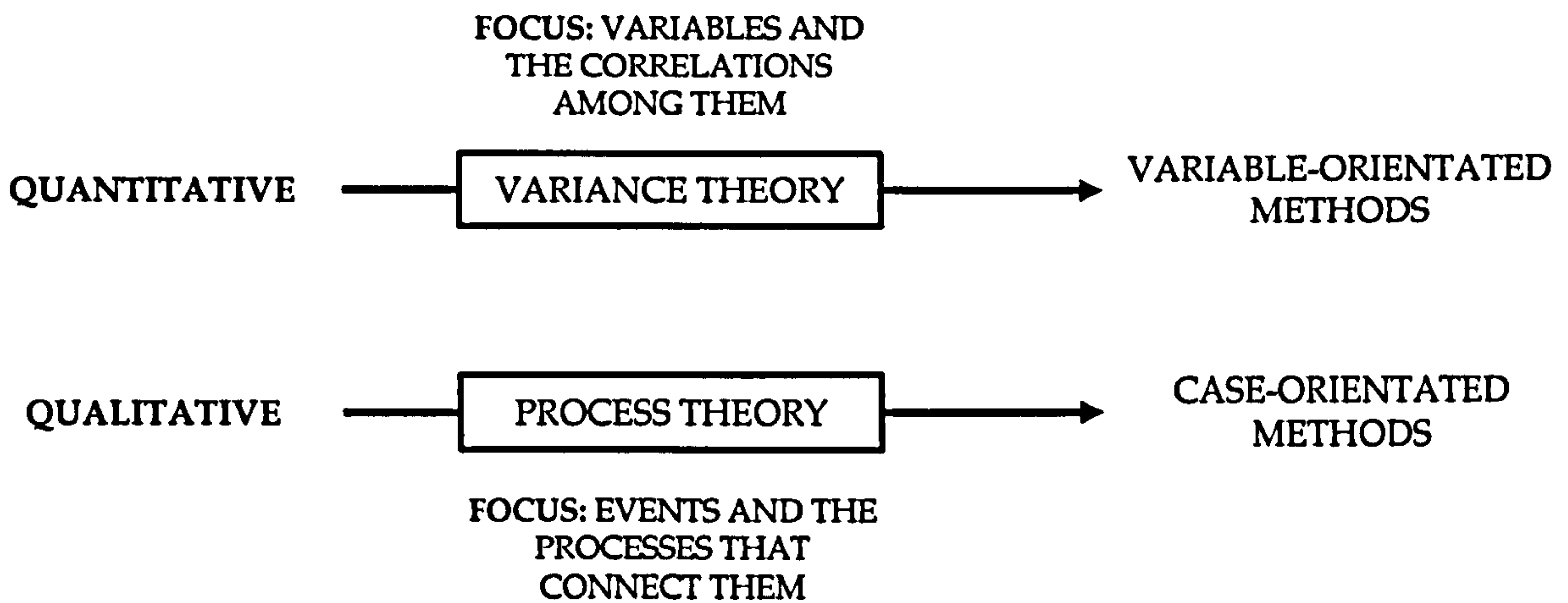


Figure 29: Different types of causal questions

Source: Adapted from Maxwell (2005) "Qualitative Research Design: An Interactive Approach" Second Edition

Questions that are therefore better suited to process theory are

"...(a) questions about the meaning of events and activities to the people involved in these; (b) questions about the influence of the physical and social context on these events and activities, and (c) questions about the process by which these events and activities and their outcomes occurred." (Maxwell, 2005, p. 75).

Maxwell goes on to say that these questions involve situation-specific phenomena, which do not lend themselves to the kinds of comparison and control that variance theory requires. Instead, they tend to require a "processual orientation" which Maxwell describes as an open-ended, inductive approach in which meanings and influences, and how they are involved in the phenomena are uncovered.

As well as confirming the thesis' decision to adopt a qualitative approach, Maxwell's analysis also informs the decision to adopt a case orientated method that satisfies the situation-specific requirement of qualitative causal studies. This case orientated approach is discussed in the following section.

6 Case Study Methodology

Methodology encompasses the entire research cycle, from “problem identification to data analysis” (Creswell, 1994, p. xvii). Yin recommends that methodology be selected based on three conditions: (i) the type of research question posed, (ii) the extent of control the researcher has over actual behavioural events, and (iii) the degree of focus on contemporary as opposed to historical events. In light of these conditions Yin recommends the use of case study when:

“A ‘how’ and ‘why’ question is being asked about a contemporary set of events over which the investigator has little or no control.” (Yin, 1994, p. 9)

Yin goes on to provide a *methodological* definition of case studies. This definition, which is broken down into two parts, firstly emphasises that case studies deliberately deal with the context within which phenomenon occur:

“A case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident” (Yin, 1994, p. 13)

The second part of the definition shows the case study to be an “all-encompassing method” incorporating specific approaches to data collection and data analysis – it “relies on multiple sources of evidence, with data needing to converge in a triangulating fashion” (Yin, 1994, p. 13). Stake (1995) on the other hand has a more *object-oriented* definition of case studies, considering them to be about a choice of the object to be studied rather than a methodological choice. These notwithstanding both agree that a case study is an exploration of a “bounded system” – that is a system bounded by time and space (Creswell, 1998). This research adopts the more methodological definition by Yin as it provided more structure for a first-time case study researcher.

6.1 Types of Case Study: Unit of Analysis

Context is important in a case study and the case needs to be investigated within its setting, which may be physical, social, historic, or economic. Furthermore, the focus of the study may be on the case itself – referred to as an intrinsic case study or the case may be an instrument used in studying an issue or issues – known as instrumental case study (Creswell, 1998).

Case can be defined in social terms as an individual, a role, a small group or organisation, community, or a nation (Miles and Huberman, 1994). They can also be defined spatially or temporally - as events or processes occurring over a period of time. The study of more than one case is called a collective case study (Stake, 1995) or multiple-case study (Yin, 1994). In addition, a single case can be multi-dimensional, with sub cases 'embedded' within it.

Yin encourages the use of a single case study when “the case represents a critical test of existing theory, where the case is a rare or unique event, or where the case serves a revelatory purpose” (1994, p. 44). With respect to testing existing theory, Yin identifies the *critical case* as a way of achieving this, saying that where the theory has a clear set of propositions and has specified circumstances within which the propositions are believed to be true, these case studies can be used to confirm, challenge, or extend the theory.

This research qualifies for the use of a *critical case*; there are clear propositions to be investigated and the circumstances within which the propositions are believed to be true have also been defined. This single case study therefore examines if and how the propositions are true, or whether there are alternative explanations that are more relevant.

The case study of this research also has more than one unit of analysis – it examines the way in which different groups of people that make up an

organisation use telephones and the impact such use has both on their individual roles as well as on the organisation. There are therefore two units of analysis in the case study of this research and it can thus be described as an *embedded* case.

The industry within which the case exists is described and discussed in Chapter 5; however, to summarise, this research examines the impact telephones have on the structuring of economic activities around a hand-woven Nigerian textile called *Aso Oke*. This is an informal³⁸, fragmented, and geographically dispersed industry with high levels of task specialisation and in which intermediaries play a significant role. The following sections discuss the design of the case methodology adopted for this research. The sampling technique employed and the protocols developed for the study are discussed.

6.2 Sampling: Selecting Participants for the Study

According to Yin (1994), the decision of how many participants to interview for a case study is dependent upon what or who constitutes a case. A *case* in this research refers to the organisational structure(s) observed in the industry. These *organisations* can be defined according to the way intermediaries and weavers group together to carrying out a transaction. *Transactions* begin at the point an order for fabric is placed. They include the activities that occur in making up the order, and end with the delivery and payment of the order to and by the buyer. Each organisational structure is composed of various individuals performing specific roles. At times, the same individual performs either a different role, or expands his/her role, and this leads to a change in structure and the emergence of a new case.

³⁸ The industry is defined as 'informal' as its activities are primarily located in the informal sector of the Nigerian economy. This characteristic is discussed in further detail in Chapter 6

Yin (1994) proposes five units/levels of analysis (see Table 3), the case study of this research focuses on the first two levels/units of analysis.

Table 3: Levels and units of analysis

LEVEL OF ANALYSIS	UNIT OF ANALYSIS	DESCRIPTION
5	POLICY	
4	STUDY	
3	MULTIPLE CASE	
2	CASE	Organisational structure/form
1B	ROLES	Weavers, Intermediaries, Buyers
1A	INDIVIDUAL(S)	Participants of the study

Source: Adapted from Yin, R. K. (1994) "Case Study Research: Design and Methods" p.71

As shown in the table above, the first level/unit of analysis has been divided into two; individuals, and the roles they adopt. The goal of the first level of analysis - 1A is to obtain information from enough individuals that function in a particular role so that consistent descriptions and/or insights about roles can be developed - 1B. This sampling technique is similar to quota selection which involves the identification of major subgroups within the case and then the selection of arbitrary numbers from each subgroup (Goetz and LeCompte, 1984 cited in Miles and Huberman, 1994). Except that in this case study numbers of participants interviewed were not arbitrary, rather individuals belonging to a subgroup were interviewed until a consistent picture of that role had been obtained³⁹. Sampling therefore continued until it became clear that several participants were saying the same things about

³⁹ This can also be described by the Law of Requisite Variety (Ashby, 1968) which is that the amount of appropriate selection that can be performed is limited by the amount of information available.

the function they perform and no new information about the characteristic of the role (relating to the objectives of the study) would be obtained from further interviews.

At the second level (i.e. the case level), the unit of analysis is the organisation (i.e. the grouping of participants to carry out a transaction) and is comprised of a combination of different individuals playing specified roles. Conclusions on centrality of intermediary activity and the effectiveness of the organisation forms uncovered by the study were drawn from this second unit of analysis. The purpose of this unit of analysis is therefore not so much to achieve representation but to uncover the conditions under which the propositions of the thesis operate. Just as various individuals are required to accurately describe a role, likewise, various occurrences of specific combinations of roles are required to accurately describe an organisational structure. A typical case criterion (Miles and Huberman, 1994) - one which highlights the 'normal' or 'average' impact of telephony on organisational structure, was used for this part of the research.

Exactly how many people should be interviewed to obtain a consistent description of roles and organisational structures is difficult to determine. Whilst mathematically, the exact number of theoretically possible combinations of roles and their resultant organisational forms/structures can be calculated, it is unlikely that all these forms will exist in practice. Whilst the desire of the study was to continue with data collection until no additional role was identified and organisational form uncovered, the extent to which this can be achieved is restricted by resource limitations including time duration of data gathering phase of research, monetary constraints etc. What was therefore sought was for sufficient variety of roles and organisations to be uncovered so that an understanding of the case industry

was achieved. The data collection process was therefore concluded when points of convergence in data had been achieved.

6.3 Documenting the Design of the Research: The Case Protocol

Instrumentation – defined as the documentation of the specific methods to be used in collecting data (Miles and Huberman, 1994) - helps to guide and focus the research during field study. Yin's (1994) suggested Case Study Protocol as well as being an instrument in itself, goes beyond instrumentation because it also contains the procedures and general rules to be followed when using the instrument.

Yin (1994) notes that the case protocol serves three key purposes. Firstly, it presents an introductory guide to those new to the research study and serves as a reminder of the study's purpose and relevance to the researcher. Secondly, the document contains the rules and procedures to be used in conducting the case study and is therefore a planning document and reference guide for the researcher. Thirdly, because the researcher must develop general rules and procedures for conducting the study prior to fieldwork, the case protocol is also a means of increasing the reliability of the study.

As with other planning documents, the case protocol is a living document and was subject to change once the actual field study began. The version developed for this research prior to the field study went through key revisions once the actual field work began. These changes were pragmatic responses to some of the issues encountered during the field study and fell within the framework/guidelines of the *a priori* protocol document. Changes that were made included a refinement of the conceptual framework of the research which resulted in a revision of the interview questions. Due to

access constraints, amendments were also made to the number of participants and role types interviewed⁴⁰.

7 Methods adopted for Collecting Data

Creswell (1998) identifies four basic types of information that can be collected during a qualitative study; these are observations, interviews, documents, and audio-visual materials. Yin (1994) on the other hand cites six; Creswell's 'documentation' is subdivided into 'documents' and 'archival records', 'observation' is subdivided into 'direct' and 'participant', and whilst Yin omits audio-visual material, he includes physical artefacts. No single form or source of information has complete advantage over the others; instead the various types complement each other and it is recommended that they be used in conjunction with each other. Three types of data were collected during this research; they are interviews, (direct) observations, and documentation.

7.1 Interviews

Interviews are particularly useful for the exploration of topics that are complex, emotionally loaded and are also useful in areas where opportunities for observation are limited. Easterby-Smith *et al.* also provide a list of circumstances under which interviews are appropriate for data collection; one such circumstance is when the "step-by-step logic of a situation is not clear" (1991, p. 74). This reflects the circumstances of this study and for this reason interviews were selected as an appropriate data collection method.

There are different types of interview. 'Open-ended' or unstructured interviews allow the interviewer to obtain the facts concerning a topic and at the same time explore respondents' opinions. Structured interviews or

⁴⁰ A narration of events that occurred during the field study is presented in section 8

surveys on the other hand utilize predefined questions to obtain facts (Yin, 1994; Easterby-Smith *et al.*, 1991). In between these two examples lies a continuum of variation; Yin for example identifies the *focused* (semi-structured) interview, which combines an open-ended, conversational style with a specified set of questions derived from the case protocol. This type of interview style (i.e. semi-structured) was considered most appropriate for this research; the way in which questions were developed for the interviews is discussed in section 7.4 below.

Although no research method is absolutely free of interpretation, the interview is more open to bias than most other research methods. This is not to say however that bias is inevitable. The way in which this bias was managed by the researcher was by not relying strictly on interviews (or any other single source of information) but by combining information from different sources. The collection of information from multiple sources using a variety of methods is an aspect of triangulation, and facilitates a more rigorous understanding of the issues being investigated (Maxwell, 2005). Other sources of information used by the research are described below.

7.2 Direct Observations

Except in cases where the phenomenon being studied is purely historical, Yin (1994) asserts that relevant behaviours and environment conditions can be observed and used as data in case studies. Observation range from being formal (involving the development of observation protocols) to jottings about participants and their environment. In this thesis, observation took place as part of the interviewing process. The researcher was a passive observer of interviewees, their environment, and of the interaction between interviewees and their environment. These observations were recorded in a research journal and were supplemented by photographs of participants in their work environment.

7.3 Documentation

According to Yin (1994), documentary information is relevant to every case study topic and exists in various forms. Those that formed a part of the data collected for this research were formal studies of the industry being researched. These include other doctoral studies and peer-reviewed articles. These documents are important in corroborating and augmenting the characteristics of the case and the evidence from other data collection methods.

7.4 Interview Questions:

“Your research questions formulate what you want to understand; your interview questions are what you ask people in order to gain that understanding” (Maxwell, 2005, p. 92)

Maxwell then goes on to highlight the thin line that exists between asking ‘real questions’ that will generate genuine understanding, and asking ‘contrived questions’ aimed at eliciting particular types of data. This distinction is difficult to identify and explain in practice. Maxwell writes that asking real questions tends to result in more symmetrical and collaborative relationships, where participants feel encouraged to bring their own perspectives to questions in ways the researcher may not have anticipated. The distinction between the question types was encountered during this research and is explained below. This explanation helps in illustrating the difficulties that can be encountered in developing interview questions.

7.4.1 Steps in developing interview questions

During the development of the case study protocol (whilst preparing for the field study phase of the research) interview questions were directly derived from the research’s suppositions. The process by which this was done was as follows:

- a. The types of questions to be asked from the study were first of all defined using the same framework that was adopted in identifying

the levels/units of analysis for the case study (see section 6.2). This is represented below as Table 4. Developing questions for the two tiers was an iterative process, questions that were to be asked of cases significantly influence the questions posed to interviewees. Interview questions must also be structured and phrased in a way that responses to them would provide enough information with which to answer questions about the case.

Table 4: Types of interview questions

LEVEL OF ANALYSIS	UNIT OF ANALYSIS	TYPE OF QUESTION
5	POLICY	
4	STUDY	
3	MULTIPLE CASE	
2	CASE	Questions asked of individual case
1B	ROLES	Questions asked of specific interviewees
1A	INDIVIDUAL(S)	

Source: Adapted from Yin, R. K. (1994) "Case study research: design and methods" p.71

- b. Once defined, these questions were then translated into "Question Frameworks". These are diagrammatic representations of questions that have been categorised according to Yin's units of analysis and linked to the suppositions of the research. An example of one of these frameworks is presented in Appendix 2 (a section of this example is reproduced below -Figure 30).

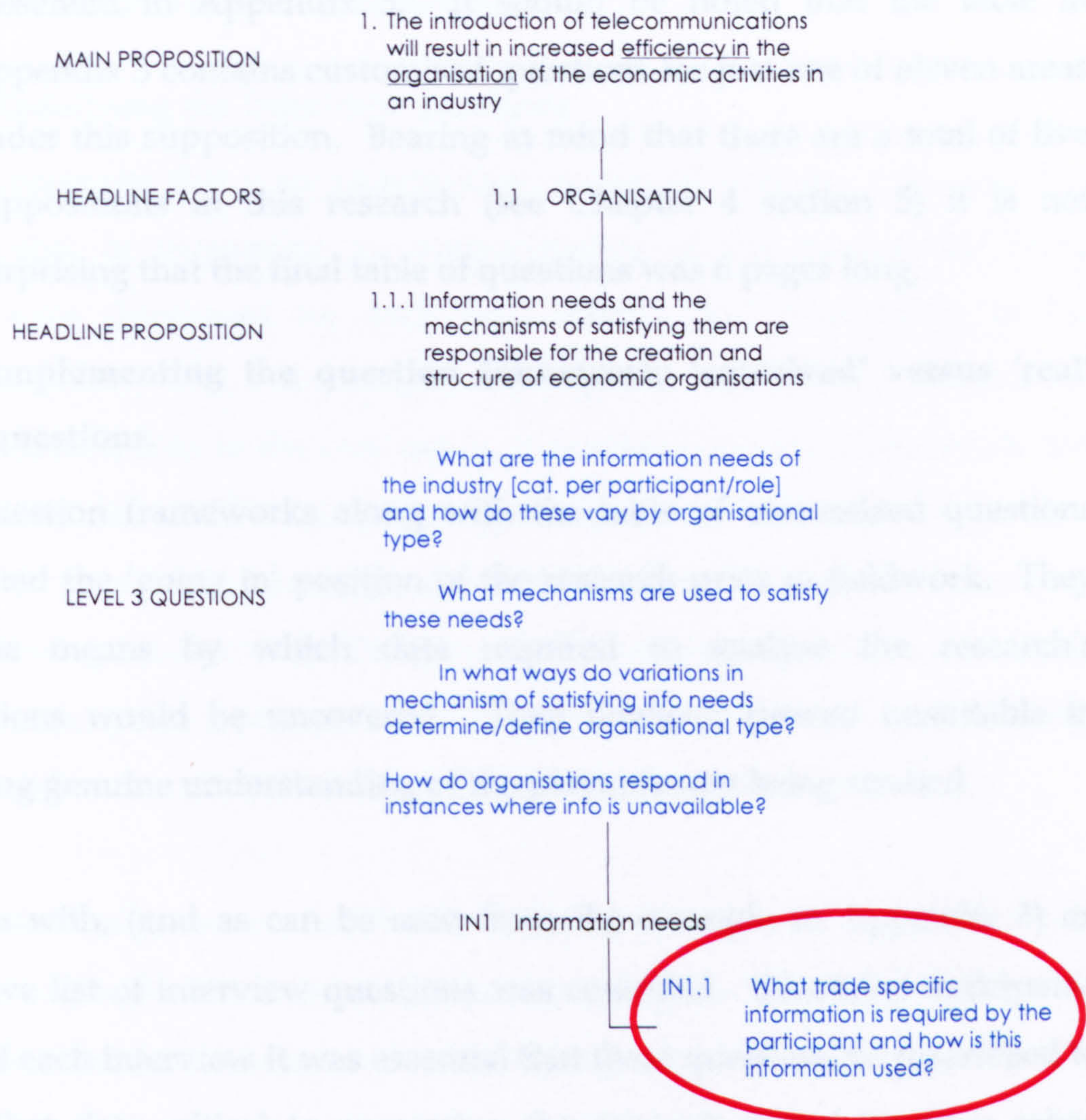


Figure 30: Question framework example

- c. Each framework has one or more supposition stated at the top of its page, which is then broken down into the key “headline” factors that describe it. In most cases, each headline factor has its own set of propositions that generate questions relating to the first two levels of analysis (i.e. levels 1 to 2 in Table 4). Questions that can be asked of interviewees (level 1) appear in green, whilst questions in blue include those asked of the roles (embedded in the case), and of findings across roles and the case in general.
- d. All interview questions were customised according to the different roles that are present in the industry. These customised questions were compiled into a table; a section showing questions developed for

the highlighted section of the diagram above (i.e. IN1.1 in Figure 30) is presented in Appendix 3. It should be noted that the table in Appendix 3 contains customised questions for just one of eleven areas under this supposition. Bearing in mind that there are a total of five suppositions in this research (see Chapter 4 section 5) it is not surprising that the final table of questions was 6 pages long.

7.4.2 Implementing the question framework: 'contrived' versus 'real' questions.

These question frameworks along with the table of customized questions represented the 'going in' position of the research prior to fieldwork. They were the means by which data required to analyse the research's suppositions would be uncovered. They however proved unsuitable in generating genuine understanding of the phenomenon being studied.

To begin with, (and as can be seen from the example in Appendix 3) an exhaustive list of interview questions was compiled. Given the anticipated length of each interview it was essential that these questions be prioritised to ensure that data critical to answering the research questions were asked within the allocated time. The questions were also ordered to achieve a logical and comfortable flow for both the interviewer and interviewee - from "easy" to respond to, generic questions, to more "difficult", intimate ones.

The process of prioritising and ordering the questions required that reference be made to the framework from which the questions originated. During this process the suitability of the questions were reassessed, particularly whether they would provide the necessary data to analyse the suppositions of the research. It was at this point that it became clear that the questions were inadequate and had to be changed before interviewing could commence. It

was also at this point that the distinction between real and contrived questions made by Maxwell became clear.

7.4.3 Redefining the interview questions

A set of questions that were standardised across all industry roles and that were capable of generating an understanding of the relationship being studied were developed for each key variable and relationship in the conceptual framework. For example, in trying to understand the information needs of participants in the case study, the initial Question Framework had developed a total of 26 ways of asking the question “What do you need to know to do your job?” (see Appendix 3) with different questions for each of the roles being interviewed. This is compared to the 5 questions developed from the conceptual framework (see Appendix 4) and which are applicable to all roles (i.e. they do not need to be customised).

These redefined questions fulfilled the criteria of eliciting participation from interviewees better than those generated using the question framework. Also, because the questions were standardised, they were easier to remember and use; and data they generated were easier to prepare for analysis. The new sets of questions were also prioritised and ordered according to how they would be asked during an interview; the result was a total of 27 questions presented in Appendix 5 along with the opening and closing remarks that made up the interview script.

7.4.4 Pilot Interviews:

In addition to the effectiveness of questions in eliciting the right type of data, another key issue regarding interview questions is the need to “test-run” or pilot them. Pilots help to test the ambiguity/lack of ambiguity of questions; and also helped to assess the ability of interviewees to answer the questions and the length of time it takes to ask and respond to all of them. Pilots also help in understanding how sensitive each question is (i.e. they help to

identify questions that participants are not comfortable answering) and can also be used to assess if questions are appropriately ordered. A pilot interview was conducted for each role, this was done to obtain the maximum benefit from the pilots and to ensure that the differing ability of participants to understand the questions was tested. The pilots did not result in significant changes being made to the questions. Changes that were made related to rephrasing, in particular the substitution of certain (complex) words for ones that were simpler in meaning.

7.4.5 Recording and Documenting Interviews:

The participants in this study are of varying levels of (English) literacy; some of the interviews were therefore conducted in “pidgin” English, and two interviews were in a language called Yoruba. Due to the researcher’s limited fluency in Yoruba, in addition to taking notes these interviews were also tape recorded; these recordings were then used to cross-check and fill in gaps in the interview notes.

All interviews were documented using a shorthand map that captured the key elements of the conversation. Key elements were noted down as short phrases and network of lines between phrases were used to show interconnection between elements and the direction in which the conversation progressed. These shorthand maps were shared with interviewees at the conclusion of their interviews when the researcher recounted a summary of the answers provided by the interviewee. On completion of the interview a “tidied-up” version of the map was developed and this version was used in developing detailed interview notes.

7.5 Summary on Data Collection

This section has described the data collection methods used for this research. The main method used was interviewing and the section described the

manner in which the approach was applied. The focus of this section has also been on the use of multiple sources of evidence so as to minimise the risk of bias. However, even with the best planning things do not always go according to plan in the field and the following section discusses the researcher's experiences during fieldwork and how the implications of some of these experiences were managed.

8 Experiences in the Field

In quantitative research, it is at times possible to control the environment in which the study is being conducted. This is rarely possible in qualitative research, the environment is dynamic and the study must adapt as best as it can to these changes. This is particularly true of field studies where the unplanned and unexpected often occur. The responses to such changes need to be carefully documented and related to initial plans for data collection so as to guard against arbitrariness (Janesick, 2000). A Case Protocol guiding data collection was prepared before the commencement of the field study; changes to this document and descriptions of what prompted them are discussed below.

8.1 Setting up the study

The data collection phase of the research was initially planned to last for approximately three months (from June to August 2003) and took place in south-west Nigeria. The initial task carried out by the researcher upon arriving in Lagos, Nigeria was to acquire the necessary "tools" to facilitate the field study process. This included acquiring suitable (and affordable) communications which was essential in setting up interviews and keeping in touch with interviewees and research contacts.

Another aspect of this setting up process was the confirmation of a reliable form of transportation to and from interview locations. Given the limitations

of the transport system in the country this proved to be a limiting factor on the total number of interviews that could be conducted. This was because the dispersed location of interviewees (some of which were in neighbouring States) and incessant traffic made driving both time consuming and exhausting. Securing and conducting interviews, as well as providing personalised feedback involved various trips to and from interview locations and the time available for the field study meant that only a fixed, limited number of interviews were feasible.

In addition to the above, the time available to conduct interviews was further reduced by significant events outside the control of the research. In July 2003, Lagos State suffered from first a general (nationwide) strike protesting a rise in petrol prices, and then from a local (specific to Lagos) strike by petroleum products delivery truck drivers. Both strikes resulted in petrol shortages (the general strike also resulted in a week long curfew) and as transportation in Nigeria depends almost entirely on the road network, the petrol shortages effectively crippled most forms of economic and social activity in the state/nation. It was therefore impossible to conduct interviews during these periods and this resulted in a delay in the commencement of actual fieldwork; the pilot of interview questions took place on Monday, 14 July, approximately one month after arriving in Lagos.

8.2 Amendments to the selection of participants

The case protocol document outlined a proposal for selecting interviewees using a main source/contact that was a close relative of the researcher. Furthermore, it was also proposed that this contact be present during interviews conducted in Yorùbá so as to help with the interpretation of industry idioms and ethnic phrases. This proposal however, raised doubts on the objectivity of interviews and the data that would be collected from them, and also on the degree of independence the researcher could exercise

in selecting participants. In order to minimise these doubts, it was decided that the researcher independently source for participants and establish contact with them and make recourse to the main contact only when the interview quota was not being achieved. It was also decided that (to the extent possible given language constraints) interviews were to be conducted without the presence of a third party.

This change in strategy meant that more time was spent in acquiring and validating referrals, establishing contact, explaining the research to potential interviewees, setting up interviews, chasing up leads etc. This had two main implications; firstly, the number of interviews conducted was significantly below the proposed quota, not only because getting willing participants and setting up interviews took time, but also because the proposed quota was found to be overly ambitious. The case protocol projected for a total of 185 interviews, a figure which is now known to be an impossible target for a single researcher with only three months in the field. The second implication was a limitation of the geographic scope of the field study. In the case protocol document, it was suggested that to lessen the impact of limited variety in interview participants and attain a higher level of sample representation, interviews should be conducted in three cities (namely Lagos, Port Harcourt, and Abuja). During the actual field study, all interviews, except for three, were conducted in Lagos. This was because most referrals were from people that had personal dealings with participants in the industry, and as these contacts preferred to deal with individuals in close geographic proximity to themselves, the interviews that resulted from these contacts were with industry participants that were based in Lagos. The three interviews that were outside Lagos were in the neighbouring states of Ogun (specifically Ijebu-Ode) and Oyo (specifically Ibadan), which are approximately 36 and 54 miles from Lagos respectively. It is worth noting that these interviews were achieved through references from individuals

who had once lived in the town/city further confirming the influence of geography on the industry.

8.3 Amendments to the sampling framework – roles interviewed

Once communication and transportation for the field study had been finalised, interview questions confirmed, and at least two willing participants secured (one with an intermediary and one with a weaver), actual interviewing/data collection commenced. In line with the Case Protocol document, a mix of roles was maintained throughout the interview process. That is to say one or two interviews with intermediaries were followed by one or two interviews with weavers. This was to allow for the amendment of future interviews to further explore/clarify emerging and interesting issues uncovered during earlier interviews. However, in the process of achieving a mix of interviewed roles, a change to the scope of the sample (that is the participant roles identified to be interviewed) occurred.

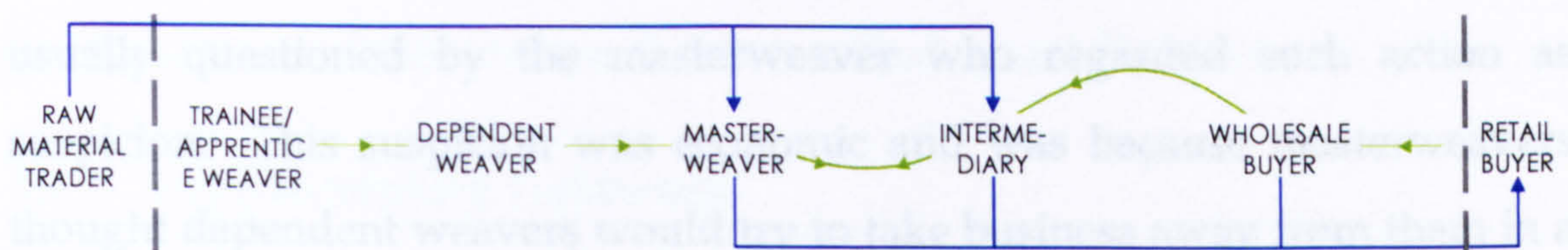


Figure 31: Roles in the *Aso Oke* industry

The diagram above (Figure 31) identifies the various roles that exist in the case industry, and illustrate the movement and direction of role migration that was assumed to occur (a detailed narrative of this diagram can be found in Chapter 6 section 5.3.4 which describes the case industry). Role migration identified within the industry is represented in the diagram by green lines. Green single-headed (straight) arrows represent a unidirectional change in role, thus after an apprenticeship period, an apprentice/trainee weaver will graduate into a dependent weaver, who can then become a masterweaver. Likewise, a retail buyer sensing the economic potential of the industry can become a wholesale buyer. A wholesale buyer can also engage in retail

transactions (i.e. transactions for personal use) however in the context of this research, this does not equate to a change in role. Green double-headed (wavy) arrows represent bi-directional change in roles. For example masterweavers can, depending on accumulated business experience and networking ability (both within the weaving community and with potential buyers), become intermediaries.

Whilst the initial aim of the research was to interview a sample of all the different roles in the industry this could not be achieved. All the referrals that were secured to weavers were to masterweavers and in all instances, access to dependent weavers was not granted to the interviewer. Dependent weavers work for masterweavers and at each weaving workshop visited, the interviewer was received by and spoke only with the masterweaver. During the interview anyone else present appeared "busy" at work and on occasion that they (noticeably) stopped working to listen to the interview they were usually questioned by the masterweaver who regarded such action as suspicion. This suspicion was economic and was because masterweavers thought dependent weavers would try to take business away from them in a bid to establish themselves as masterweavers.

Still in relation to the weaving community, it was also observed in the field that there are few apprentices in Lagos. People that are indigenous to weaving areas were never referred to as apprentices (an observation that was also noted by Clarke, 1999). The term 'Apprentice' is applied only to those that pay to be taught the skill. During the interviews, it was discovered that few people were patient enough to complete the "training" and that most apprentices left the workshops as soon as they had learnt the very basic technique of weaving. Furthermore, because weavers do not operate a salaried form of remuneration (payment is based on orders produced), the masterweaver must ensure that he has enough orders to "pay" his

dependent weavers. There is therefore little or no demand for weavers with basic skills and apprentices that do not stay out the course of their training do not get retained. All the dependent weavers spoken of during the interviews were from the masterweavers' community of origin. As a result of this, of all the different types of weavers that exist in the industry, only masterweavers were interviewed during the field study.

The interviewing process also revealed that the demarcation between intermediary and wholesale buyer was artificial. All wholesale buyers are intermediaries but not all intermediaries are wholesale buyers; this depends on the size of the intermediary's business with larger/bigger ones having more stock. The wholesale buyer role was therefore reclassified as intermediary and a note made of the "size" of the intermediary's business. Finally, due to an inability to secure access to them, none of the raw material suppliers were interviewed. In summary, roles for which interviews were conducted were: Masterweavers, Intermediaries, and Retail buyers.

8.4 Supplementary fieldwork

Research is an iterative process and the design of any qualitative research is subject to continuous revision so as ensure that the objectives of the research are met. Data collected from the field were reviewed alongside the conceptual framework to ensure that they are relevant in analysing the research's supposition. Such a review was conducted after the initial field study and it was observed that some gaps existed in the data.

The first gap relates to the representation of role types within the interview sample. Some role types (intermediaries and masterweavers) were better represented than others (buyers). This was because the information obtained from retail buyers converged quickly - i.e. by the third or fourth interview, exactly the same story was being told and the same issues/problems were

being recounted. However, so as to achieve representation of all participants in the industry, more interviews with buyers were documented.

The second gap emerged after preliminary analysis of the data collected, and was of the need to interview intermediaries or designers who differentiated the woven fabric in one form or another in order to increase its value. This was considered important in better understand the impact technical capabilities and methods have on relationships between participants as well as on the structure of the industry.

Two tactics were employed in addressing these gaps: the first required the researcher to return to the field to conduct more interviews. The second involved data collection using the documentation method, specifically looking for similar research on the case industry.

Therefore between the 12th and 17th of April additional in-depth individual interviews were conducted by the researcher in Lagos, Nigeria. These interviews were used to collaborate and expand upon findings uncovered by prior research. Interviews were held with a buyer, who was then in the process of placing orders for fabric, and also with a fashion designer and proprietor of a haute-couture house renowned for its innovative use of *Aso Oke*.

9 Data Analysis

Miles and Huberman (1994) defined data analysis as an interweaving of three activities: (i) data reduction - which involves selecting, focusing, simplifying, and transforming field notes or transcripts; (ii) data display - organising compressed information into displays that permit the drawing of conclusion and further action; and (iii) conclusion drawing and verification (see Figure 32).

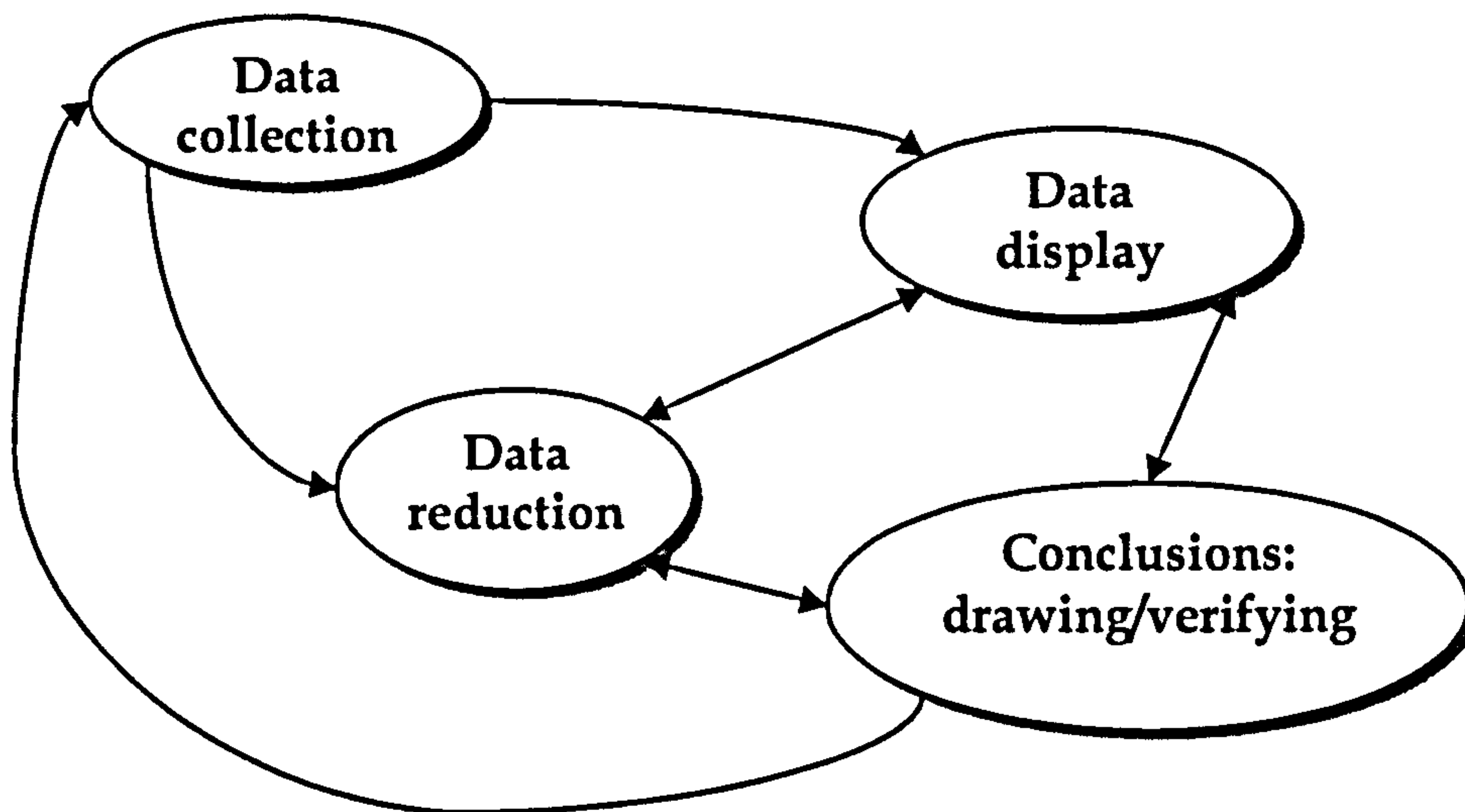


Figure 32: Components of Data Analysis: Interactive Model.

Source: Miles, M. B. and Huberman, A. M. (1994) "Qualitative data analysis: an expanded sourcebook." p. 12

Not only are these three activities interwoven, they also interrelate with the process of data collection. In qualitative research, data collection does not end for data analysis to begin, rather during data collection, the researcher moves between the four activities depicted in the diagram above. The processes of data reduction, display, and the drawing of conclusions and verification often require that more data be collected and/or result in the creation of 'new' data. Qualitative analysis is thus "a continuous, iterative enterprise" (Miles and Huberman, 1994, p. 12).

At the conclusion of the field study, data had been collected from multiple sources and was in various formats. This included audiotapes of two interviews, personal reflections made by the interviewer in the form of memos, typed up interview notes that were use in formal feedback sessions with interviewees, shorthand maps of key relationships that emerged from interviews, and photographs that supplemented explanations of some product features and production techniques that related to the case industry. A total of sixteen (16) interviews were documented from seven (7) intermediaries, six (6) weavers, and three (3) buyers. The first task faced in

data analysis was to identify an appropriate format that would facilitate the analysis of the data. The second task was to convert the data into the identified format. This format is described below - 9.1.

9.1 Data Preparation: Standardisation of Data

The primary objective in deciding on an appropriate format was to ensure that the data collected was (to the maximum extent possible) embedded within the context in which it was collected. It was felt that leaving the data in a map-like state without including descriptive texts showing what the mapped phrases and concepts were representing, and the manner or flow in which the interview progressed, would amount to summarising the data too early. It was therefore decided to convert all maps and audio data into a descriptive textual form called "interview summaries" with specifically defined margins for adding notes and writing down personal observations (see Appendix 6 for an example). In this textual format, the interview summaries can be easily imported into a data analysis software package for further manipulation and analysis.

9.2 Data Reduction: Organising and Retrieving Data

One of the challenges faced by qualitative researchers is the difficulty faced by researchers in distinguishing between different types of information and knowing which is more important than another. Data collection and organisation is therefore a selective process and how this selectivity is managed poses an additional challenge to the researcher (Miles and Huberman, 1994). A related, second challenge is therefore how to manage this selectivity. This is to an extent helped and justified by the presence of conceptual frameworks and research questions/hypotheses which help in determining the data that are the most relevant to the study.

Furthermore, the analysis of data has to occur in context (Maxwell, 2005). Codes are a means of achieving this and are defined as tags or labels for assigning units of meaning to information compiled during a study (Flick, 2002). Codes are attached to “chunks” of data and are used to retrieve and organise related chunks for further analysis. The organisation of data therefore consists of a system for categorising the various chunks of data (and thus codes) in a way that allows for the quick identification and clustering of segments of data that relate to a particular research question, hypothesis, construct, or theme.

The grouping and display of collated/correlated chunks of data in turn set the stage for drawing conclusions. Coding can therefore be seen as a method of organising and retrieving data that can empower and speed up data analysis. The process by which codes were developed for this study, the ‘reliability’ of these codes, and the manner in which they were used during analysis (i.e. the coding process) are discussed in the following sections.

9.2.1 Creating Codes

Three types of codes are identified by Miles and Huberman (1994):

- a. Descriptive codes that entail little interpretation but rather attribute “a class of phenomena to a segment of text”
- b. Interpretive codes that seek to explain or understand the various meanings behind phenomena, and
- c. Pattern codes which are inferential and explanatory, and are used to identify and mark the importance of segments of text or other features that are repeated frequently in the data.

These codes are generated and used at different times during analysis: descriptive codes are created and used at the start and interpretive and pattern codes emerge and are used later in analysis (when more is revealed about the area under study and patterns become clearer).

Various methodologies can be followed in actually creating codes. Miles and Huberman (1994) advocate the compilation of a provisional “start list” of codes prior to fieldwork and generated from

“...the conceptual framework, list of research questions, hypotheses, problem areas, and /or key variables that the researcher brings to the study. (p. 58)

Codes can also be created inductively after data has been collected and reviewed. This is a more open, context-sensitive technique but as with the *a priori* approach the ultimate objective of inductive techniques is to match data to a theory or set of constructs. Another approach to creating codes lies between the *a priori* and inductive techniques and involves the creation of a scheme of codes that whilst not being content specific, highlight the general domains under which codes can be developed inductively.

The way in which codes were created during this research can be described as being a variant of the *a priori* method described by Miles and Huberman. These codes were created via a review of the conceptual framework and suppositions of the research. This helped to establish a conceptual and structural ordering of codes. The resulting schema of codes (see Appendix 7) has the key variables of the conceptual framework as its focus, these key variables form the broad categories under which codes are further organised and are referred to (in the schema) as “concepts”. These concepts were then broken down into progressive levels/layers of codes that more clearly described the particular characteristic to be coded in the data. Table 5 below illustrates with an example the structure of codes that resulted from this process. As can be seen, Level 1 codes represent an aspect of the broader “Concept” being studied, and Level 2 codes further describe and/or categorise Level 1 codes.

Table 5: Illustrative example of coding schema

Concept = key variables of conceptual framework	for example Roles [RL]
<hr/>	
Level 1 for example Role Identity [RLID]	
<hr/>	
Level 2 for example Weaver; Intermediary; Buyer [WVR/ITMED/BYR]	

Operational definitions were also developed for each code and are contained in Appendix 7. These definitions help to ensure that codes are applied consistently either by a single researcher over time or by multiple researchers, and that the same phenomena is the focus of such coding. The objective of consistency, as well as the applicability of the codes generated, and the clarity of their definitions was crosschecked through a code-checking exercise.

9.2.2 Crosschecking Codes

The crosschecking exercise involved four different individuals separately coding the same sample of transcribed interview notes. These coded notes were then compared against each other and incidences of agreements and disagreements analysed. The analysis involved firstly identifying and counting the number of “agreements” between coders – i.e. when the same code is applied to the same section of text. The number of agreements between coders was calculated and is summarised in Table 6 – for example the table shows that there were 15 occasions in which both the interviewer (researcher) and one of the individuals involved in the cross checking exercise (identified as Checker 1) coded the same portion of text with the same code. A group aggregate was also computed; this was calculated by counting the number of times two or more coders applied the same code to the same section of text.

Table 6: Total number of agreements between coders

	Interviewer	Checker 1	Checker 2	Checker 3
Interviewer		15	12	12
Checker 1	15		15	17
Checker 2	12	15		13
Checker 3	12	17	13	

Aggregate for all coders 42

The number of “disagreement” amongst coders was also calculated. Disagreement refers to occasions where two (or more) coders attached different codes to the same section of text. The total number of agreements and disagreements were then used to calculate both individual and aggregate intercoder reliabilities, which is a mathematical measure of the extent to which different coders use the same codes for the same blocks. Reliability is calculated using the formula:

$$\text{Intercoder reliability} = \frac{\text{Total number of agreements}}{\text{Total number of agreements} + \text{Total number of disagreements}}$$

Calculated reliabilities are presented in Table 7 below:

Table 7: Intercoder reliability [Disagreements]

	Interviewer	Checker 1	Checker 2	Checker 3
Interviewer		54%	55%	41%
Checker 1			60%	53%
Checker 2				50%
Checker 3				

Aggregate for all coders 61%

An initial (aggregate) intercoder reliability of 61% is judged to be adequate as it is unusual to get a score higher than 70% the first time reliability is calculated (Miles and Huberman, 1994). The definition of “disagreement” can however also be expanded to include “omissions”, which are defined as

instances in which a code is applied to a section of text by just one coder. This might be due to an oversight by the other coders, or as a result of differences in interpretation or misinterpretation of the code definitions. Intercoder reliabilities taking “omissions” into consideration were calculated using the following formula and are presented in Table 8 below.

$$\text{Intercoder reliability} = \frac{\text{Total number of agreements}}{\text{Total number of agreements} + \text{Total number of disagreements and omissions}}$$

Table 8: Intercoder reliability [Omissions]

As can be seen from the table above reliability values using “omission” differ

	Interviewer	Checker 1	Checker 2	Checker 3
Interviewer		33%	26%	26%
Checker 1	23%		23%	27%
Checker 2	26%	33%		28%
Checker 3	19%	27%	21%	

Aggregate for all coders 48%

for each pair of coders. This is because on each occasion it is the coder on the vertical axis of the matrix who determines the total number of omissions. For example, considering the interviewer and checker 1, the number of times the interviewer attached a code to a section of text that checker 1 attached no code to was 31. Whilst the number of times checker 1 attached a code to a section of text to which the interviewer attached no code was 49. The reliability scores for interviewer to checker 1 is therefore higher (33%) than for checker 1 to interviewer (23%). These reliability values are thus highly dependent on the frequency of coding by individuals. As shown in Table 9, checker 1 and 3 had more instances of coding than the interviewer and checker 2. Their reliability scores are therefore on average lower than those of the interviewer and checker 2. Reliability scores calculated using omissions are therefore in general lower when a coder that has a higher frequency of coding is compared with one with a lower frequency.

Table 9: Coding frequency

Coder:	Interviewer	Checker 1	Checker 2	Checker 3
Total number of times coded:	46	64	46	62

Understanding the reason for such differences in coding frequency is therefore important in improving the reliability of the codes. In this research it was found that these differences were due to two things:

- a. Oversights in coding – i.e. when a coder misses an opportunity to apply an appropriate code to a relevant portion of text
- b. Coders interpreting code definitions differently – this was generally the case and as such, a key output of this exercise was the identification and the rewriting of obscure code definitions achieve better clarity.

The crosschecking technique described above can also be used as a measure of internal consistency to assess how consistently a single researcher applies the codes over time. After an interval of 2 weeks from the initial intercoder crosschecking exercise, the same transcribed interview notes was recoded by the researcher and reliability measurements were calculated to be 74%. This means that (after a 2 week interval) the researcher was able to apply the same code to the same portion of text 74% of the time. This level of internal consistency is judged as being adequate as Miles and Huberman (1994) suggest an initial code-recode reliability of 80%.

9.3 The Process of Coding

The process of reading through the transcripts and memos, and attaching codes to segments of text is termed coding. Flick (2002) distinguishes between theoretical and thematic coding. In theoretic coding, data is analysed to develop a grounded theory. Coding here refers to “the operations by which data are broken down, conceptualized, and put back

together in new ways” (Strauss and Corbin, 1990 cited in Flick, 2002, p. 177). In theoretic coding ‘open’, ‘axial’ and ‘selective’ codes are used iteratively to develop theory. Thematic coding on the other hand builds theory using a comparative orientation.

This research adopted a variation of the theoretic coding approach. In the first instance (in a process akin to ‘open coding’) *a priori* codes were attached to written transcripts of interviews conducted during field study. These codes were also attached to memos – i.e. documents created for each interviewee that contain observations about the interview, mannerisms of the interviewee, descriptions of the interview environment, and other relevant notes relating to the interview.

During this process of attaching *a priori* codes to data, new codes that had not been thought of prior to data analysis (but which were relevant to the phenomena being studied) were also created. These codes are identified and discussed in section 9.6 of this chapter.

After attaching codes to text the next step was to categorise the codes into *generic concepts* and to explain the relationship between codes that were grouped together into concepts. Relationships between the different concepts, and the context in which the concepts exist were also examined. This step is similar to Strauss and Corbin (1990) ‘axial coding’. The schema used in structuring *a priori* codes already indicate some form of categorisation, and the mappings of the codes unto the conceptual framework suggest relationships that are anticipated to exist between categories. These relationships were explored and explained using data display methods which are discussed later in this chapter (section 9.7).

The coding process itself generates data. The rationale for using a particular code for a particular section of text, as well as the development, description, and use of 'new' (more inductive) codes, as well as the emergence of themes and insights were all recorded in a project journal. The project journal also contained detailed documentation of tasks undertaken during data analysis and the reasons such tasks were carried out. The project journal therefore provides a comprehensive audit trail that can be used in understanding and supporting conclusions drawn from the data.

9.4 Preparing for Data Display: Mapping Conceptual Framework, Research Suppositions, and *A Priori* Codes

The links between data analysis, the conceptual framework, and the suppositions of the research are important ones that are the basis on which conclusions on the data collected can be drawn. These links also inform the ability of the research to answer the questions it set out to answer in the first place and determine the extent to which the study fulfils its objective.

The chapter on Conceptual Framework (see Chapter 4) illustrated how the suppositions of the research mapped onto the conceptual framework (see Figure 27). Appendix 8 expands on this by mapping the *a priori* codes developed for analysis onto the conceptual framework. This mapping is illustrated below using one of the research's suppositions: *Information imperfections create varying levels of instability in the market*. The segment of the conceptual framework that represents this supposition is represented in figure below:

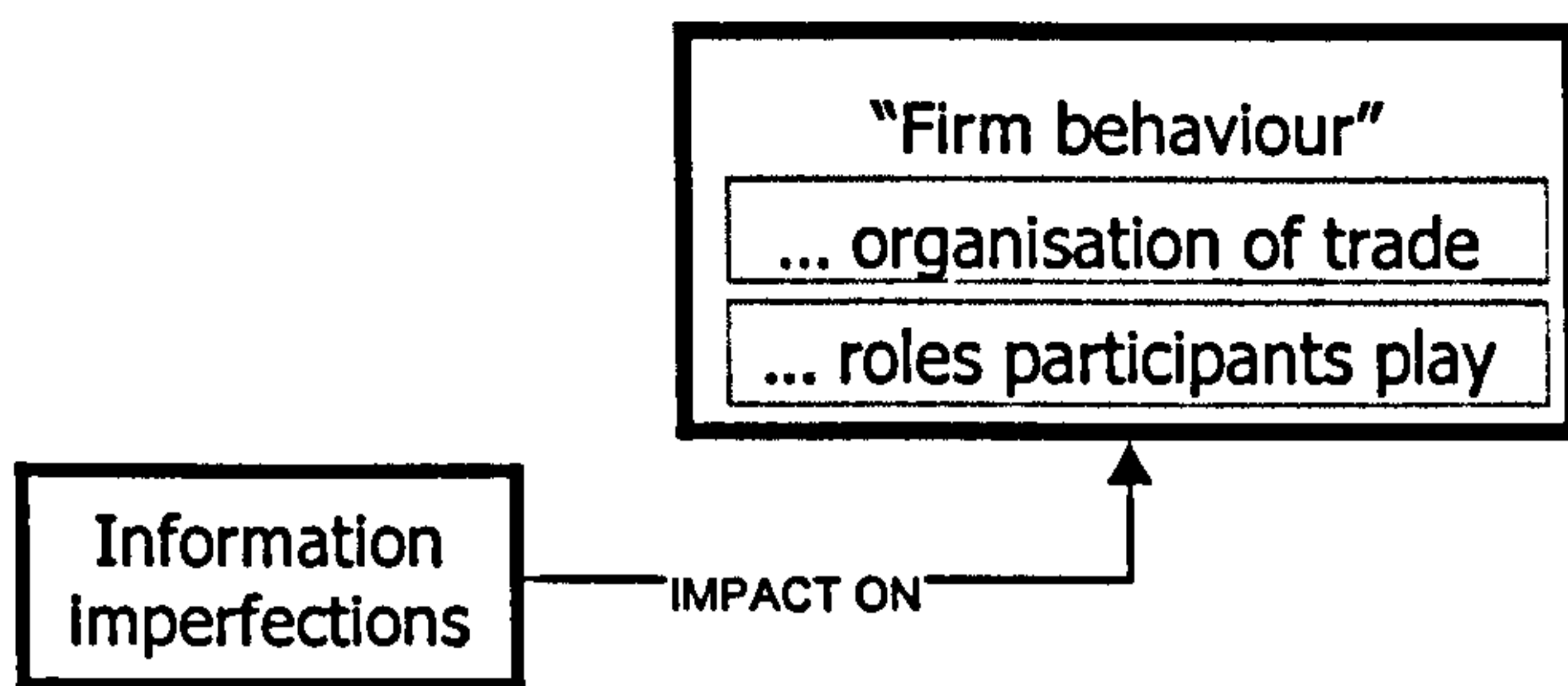


Figure 33: Components of conceptual framework relating to information imperfection-market instability supposition

Thus according to Figure 33, the instability created by imperfect information can be seen expressed in the behaviour of participants in the industry. This behaviour can be investigated in terms of the roles played by participants during trade and how their relationships are organised. The codes that apply to the supposition are presented in Table 10.

Table 10: Codes relating to information imperfection - market instability supposition

Code	Name and Description	Notes [where applicable]
INFO	Information: this code captures all references to information and its use.	
INFO ASYM	Information asymmetry: codes incidences in which one party to a transaction has more information than the other party. This code can be further broken down to identify causes of information asymmetry and its effects [Cau/Eff].	INFO/ASYM/Cau INFO/ASYM/Eff
INFO DEF	Information deficiency: codes incidences in which none of the parties to a transaction has the required information.	

According to the table above, occasions of information imperfections where either one party to the trade has more information than others should be coded using INFO ASYM. Where neither party possesses the information that is required the code INFO DEF is used. Analysis of the segments of text to which these codes are applied therefore test the validity of the supposition. That is, uncovering examples of "information imperfections" that relate to "firm behaviour" (as cited by interviewees), will provide the basis for

adopting or rejecting the supposition that a relationship exists between information imperfections and a state of instability.

This process of mapping *a priori* codes to the variables of the conceptual framework was applied to all of the research's suppositions and the result is summarised in Appendix 8. Descriptions of each code are provided in Appendix 7.

An examination of the applicability of certain theories to the case study tells a particular "story" of what the researcher sees occurring in the data, however, the data itself can (and does) have its own "stories". A balance therefore needs to be maintained when coding, between the deductive method of attaching *a priori* codes to text and the more inductive examination of the data. These two approaches occur iteratively – each providing the impetus for the other and it is via these iterations that conclusions on the research's hypothesis –i.e. *the information economising advantages of telecom use will promote the creation of specialised intermediaries in industries resulting in organisational structures that are able to support and promote higher levels of trade* – can be drawn.

9.5 Using Computer Software Packages for Qualitative Analysis

Much has been written on the implications of using computers in qualitative research (Silverman, 2000; Flick, 1998; Denzin and Lincoln, 1994; Rouse and Dick, 1994; Tesch, 1990). Richards and Richards (1994) speak of the dramatic implications of the "computer method" on the process and outcomes of research, noting that there is a danger that software can and does constrain and distort research. Creswell (1998) notes that some researchers can

wrongly substitute software for careful analysis of the data; and that software can coerce some researchers along a particular track⁴¹.

Qualitative research involves the analysis of multiple sources (and formats) of data in heterogeneous ways. This involves recognising categories in the data, generating ideas about these categories, testing those ideas, and exploring the meanings; all of which demand a high level of data management. Insights and discoveries have to be stored, retrieved and tested against varying scenarios and the results of these tests stored; categories have to be not only developed but also easily recognised, and more importantly linked in some way to the data. The construction of theory may well be a creative process (and not merely a mechanical one) (Richards and Richards, 1994); however the use of software packages clearly enhances this process by assisting in the management of data, documents and ideas.

9.6 Using QSR NVivo

As discussed in the sections above, the analytical approach adopted for this thesis involved data being segmented into clusters that were then reorganised firstly according to relationships predefined in the conceptual framework and also according to patterns that were seen to emerge during analysis. This process is known as the decontextualization and recontextualization of data, and can be facilitated by computerized software tools (Rouse and Dick, 1994). In this thesis, coding and the creation of matrices (for data display) were performed with the aid of a qualitative analysis software package called NVivo.

⁴¹ Creswell (1998) gives the example of a researcher that uses a particular category to identify segments of data at the start of the analysis process being reluctant to later change either the label of the category, the information contained within it, or reorganize data under different categories at a later stage. This, according to Creswell, may be due to the researcher perceiving the categories as being “fixed” in the computer software.

9.6.1 Features of the software that had an impact on data analysis

It is important to understand before hand what the software is capable of doing, how it performs required functions, and the format (or structure) data adopts when inputted into the software. Early in this chapter (section 9.4) the manner in which *a priori* codes relate to the variables of the conceptual framework was discussed. A comparison of the list of *a priori* codes (Appendix 7) and those that have been mapped to the conceptual framework (Appendix 8) reveals that not all of the codes are directly related to any one variable. Such codes are those that characterise the person being interviewed rather than the phenomenon being investigated. They include:

- a. Role identification (RLID) codes - used to classify the role of the interviewee in the industry
- b. The skill acquisition aspect of the Role adoption (RL ADP) code - i.e. categorisation of whether the skills required to adopt a particular role were acquired as a result of lineage or independent of lineage (non-lineage)
- c. Role migration code (FB RLMIG) - used to indicate whether or not interviewees performed a different role in the industry from the one they are now performing.
- d. Role combination code (FB RLCMB) - indicates if the interviewee performs more than one role in the industry and if roles are performed concurrently or at disparate times

These codes are inputted into NVivo as “attributes”. In the software, attributes are used to

“...store information about documents or people, sites, events and other phenomena ... Researchers storing such information can then use it in seeking patterns and asking questions about the project.” (Richards, 2002, p. 54)

A priori codes that were descriptive of people, location and events were therefore inputted as attributes whilst codes relating to the themes and topics

of the study were inputted as nodes⁴². The complete list of attributes, their values, and where applicable the *a priori* codes that described them are listed in Appendix 9.

Another useful feature of NVivo relating to the structuring of inputted data is its ability to support long names; the names given to all the codes were therefore expanded to make them more descriptive and easy to recognise/decipher. This revised list of codes is presented in Appendix 10 with the *a priori* codes listed alongside. The support NVivo provides for naming codes also made it easy to remember and use 'new' codes that emerged from the data during the coding process (these are the codes that do not have corresponding *a priori* versions in Appendix 10). In section 9.3 it was mentioned that certain codes emerged from the data during the coding stage of analysis. These codes represent the 'story' emanating from the data itself as opposed to that being told by the researcher of what she sees occurring. These more inductive codes are listed in the Attachment as 'Free Nodes'.

9.7 Data Display: Matrices

Miles and Huberman note that

“Usually it is hard to explain something satisfactorily until you understand just what the something is.” (1994, p. 91)

During data analysis, the research tries to understand what is happening with respect to the phenomena being studied by reducing the phenomena into its constituent (or component) parts. Furthermore, the researcher also tries to show how these component parts fit together according to the theories on which the study is based.

⁴² Codes are referred to as 'nodes' in NVivo

Analysis can therefore be thought of as comprising two main stages: the first commences with the categorisation of data through the process of coding. It involves identifying themes and trends, and testing these out in order to “delineate the deep structure” of the data so that a satisfactory understanding of the phenomena is achieved. This then leads to the second stage which comprises of testing hunches of how the component parts of the structure of the data fit together according to some rules; here the researcher tries to “integrate data into an explanatory framework” of the phenomena.

For this research, data displays played a prominent role in the first “delineating” stage of data analysis. Data display may be defined as:

“...a visual format that presents information systematically, so the user can draw valid conclusions and take needed action.” (Miles and Huberman, 1994, p. 91)

Display formats fall into two main groups: “*matrices*, with defined rows and columns, and *networks*, [consisting of] a series of nodes with links between them” (1994, p. 93). The following types of displays are recommended for embedded (or within-case) descriptive analysis:

- a. *Partially order displays* for use at more exploratory stages of studies
- b. *Time-ordered displays* for data that is to be displayed by time and sequence
- c. *Role-ordered displays* for displaying data according to the roles people play in formal or informal organisations
- d. *Conceptually ordered displays* for data that are ordered according to concepts or variables.

For studies designed to answer various research questions Miles and Huberman recommend that rather than performing separate analysis and reports for each, several research questions be clustered and analysed together to generate meaning more easily. Conceptually clustered matrices are a means of achieving this; they consist of

“...rows and columns [that are] arranged to bring together items that belong together.” (1994, p. 127)

For this study, the research suppositions and codes (both *a priori* and inductive) that relate to them were used as the basis for constructing columns and rows. Furthermore, the ordering principle used in constructing the matrices were themes (rather than participants or roles), and as such the display type adopted by this research can be more specifically defined as Thematic Conceptual Matrices.

These matrices were developed with the aid of the software NVivo. As mentioned previously, each of the research's suppositions has a set of codes associated with it (refer to Appendix 8) and these were used to code data collected during the fieldwork. Using NVivo's 'search' function, matrices were created at various levels of relationship; i.e. between groups of codes that define a particular supposition, as well as between aggregates of codes to explore and explain the relationship between suppositions. A detailed example of how this process was performed is presented in Appendix 11. Using the “Information Imperfection” variable of the conceptual framework it describes how the matrix was constructed and analysed.

The introduction to this section defined data analysis as comprising of two main stages. The first stage is concerned with delineating the deep structure of the data as a means of understanding the phenomena being studied. The second stage involves integrating the data into an explanatory framework of the phenomena. This section has outlined how the delineating stage was conducted in this study; the next section discusses the manner in which conclusions were drawn and verified.

9.8 Drawing and Verifying Conclusions

The processes of data display, conclusion drawing/verification, and data collection are interwoven (Maxwell, 2005) and the example of the development of matrices outlined in Appendix 11 attests to this. Conclusions were being drawn throughout the development and interpretation of matrices, and these conclusions were verified using evidence both from the data and (when applicable) wider literature.

This research sought to build an explanatory framework to explain the results uncovered by the study. This framework is itself open to further explanation and is dependent on the conditions of the research. Explanation here is defined as

“Concatenated description ... putting one fact or law in relation with others” (Kaplan, 1964 cited in Miles and Huberman, 1994, p. 144).

The type of display used in supporting the process of explanation formation was causal networks (Miles and Huberman, 1994) or causal mapping (Eden and Ackermann, 1998). This display format pulls different variables (both dependent and independent) together into a ‘coherent picture’ of what seen to be taking place in the data. Ambrosini and Bowman (2001) identified this placing of variables in relation to one another as one of the main advantages of causal mapping; according to them it imposes “structure on vague situations” (Weick and Bougon, 1986 cited in Ambrosini and Bowman, 2001, p. 818). Causal maps can therefore represent multiple explanations and consequences, and (in addition to showing relationships between variables) can also be used to show potential contradictions (Eden and Ackermann, 1998).

An example of the use of causal mapping in generating explanations is presented below; this example refers to the matrices discussed in Appendix

11. It was stated in section 9.7 that thematic conceptual matrices were developed to facilitate understanding of the phenomenon being studied. A causal map was created for each of these matrices; these maps helped to place the variables being examined in the context or circumstance in which they were found occurring. Thus (with reference to the example presented in Appendix 11) in the process of understanding occurrences of information imperfections in the industry, their consequences, and responses to them; it was noticed that the process of searching for and acquiring raw materials (in particular thread) for fabricating the textile was repeatedly mentioned. This process was therefore mapped and as shown in Figure 34 a total of six uncertainties are associated with this process, these are:

- a. Whether or not the required colour/shade of thread will be available on the market throughout the period in which the textile is being produced.
- b. Whether or not the required colour/shade of thread will be available in local ⁴³markets.
- c. Should the search have to be extended beyond the geographic vicinity of the purchaser there is the uncertainty of whether the required colour/shade of thread will be available in other markets.
- d. In order to ensure an adequate supply of thread throughout the course of an order, it is common for intermediaries to buy thread in bulk. This however creates uncertainties as to whether or not the customer will change their design preferences.
- e. There is also the uncertainty that the customer will change the size of their order. This is particularly a problem when customers increase the size of their order.

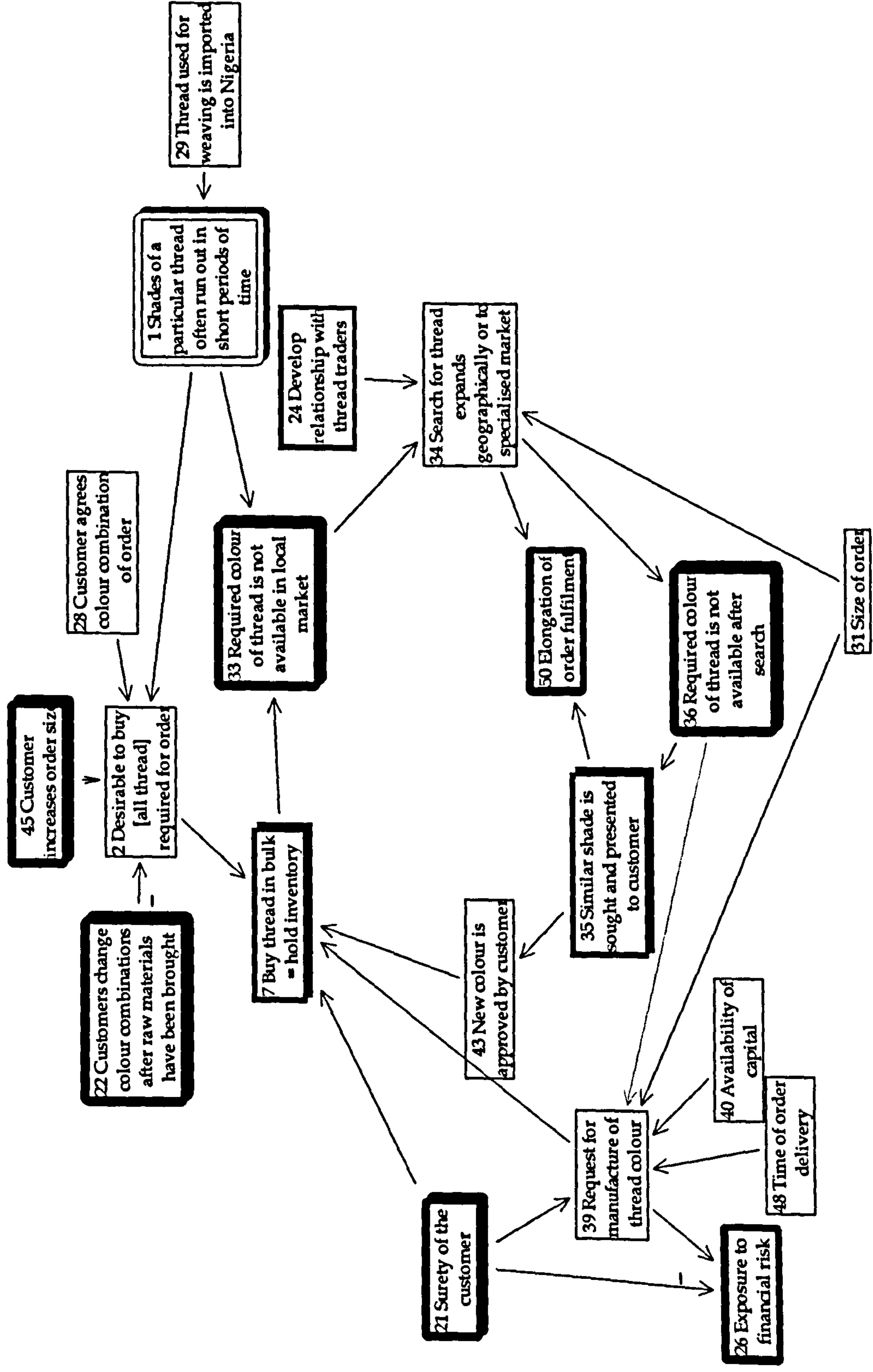
⁴³ Local here refers to geographic proximity. There are cost savings associated with procuring thread from markets located close to where the textile is being produced, these include savings on transport costs and opportunity cost of time and resources spent in searching at more distant markets.

- f. Lastly there is the uncertainty that after investing in raw materials and producing the order, the customer may not be able to pay

The outcomes of these uncertainties, the responses in terms of intermediary activity to these uncertainties, and the manner in which trade is conducted (organisational forms) in response to them are also highlighted in the map.

As noted by Miles and Huberman (1994) for causal networks to be meaningful they must be accompanied by analytical texts that explain the connections between the variables they contain. An extract of the text accompanying the map is displayed in Box 2. This extract explains the search strategy adopted by participants. To help the reader relate the text to the map more easily, the portions of the text that relate to map variables have the number attached to the variable in the map preceding them.

Figure 34: Causal map representing uncertainties relating to the search for thread



The search for thread is therefore an important activity and the (search) strategy adopted depends on a variety of factors. One such factor is the ³¹size of the order:

The order quantity determines where raw materials [specifically thread and yarn] will be brought.

Small quantities of thread are firstly sourced from traders that are geographically local to the buyer, with the search expanding geographically when ³³a specific shade of thread is not available locally. This expansion extends firstly ³⁴within the town or city the purchaser resides in:

[*Weaver speaking*] The "thread" is purchased at various markets, but it is firstly sourced at markets nearer to the shop first [for example Penn Cinema, Agege] and more distant ones ["Maternity", Lagos Island] if the thread is not available locally.

And then to known wholesale markets or centres. These centres may be ³⁴other towns/cities or specialised cloth markets.

[*Intermediary speaking*] The situation [i.e. supply/availability of thread] has however improved over the past 5 years and if a shade cannot be found in Ibadan it is usually obtainable in Lagos.

Oje is a specialised market for *aso oke*. The intermediary mentioned it in reference to buying thread, stating that in addition to [Oju Pa- a specialized thread market in Ibadan], thread sellers also gather there.

Another factor influencing search strategy is the existence of a ²⁴relationship with a trader. Where a relationship exists, the trader is contacted first for the thread and should the required shade be unavailable (or not in stock), the trader may (on the buyer's behalf) search for the required shade, asking other thread sellers or getting in touch directly with manufacturers/importers.

[The weaver] buys from/deals mainly with three people but will expand his search if a particular shade of thread is hard to come by.

[With reference to an intermediary that has an established relationship with a thread seller] When a particular type or colour of thread is unavailable, the thread seller will often obtain it from, or recommend an alternative seller.

Reference is consistently made to segments of the data to illustrate conclusions that have been drawn. With specific reference to information imperfections, these are more succinctly presented in the combined matrix illustrated by Table 18 in Appendix 11. Such matrices are best defined as

Case Dynamics Matrices which display "...a set of forces for change and traces the consequential processes and outcomes" (Miles and Huberman, 1994, p. 148). Conclusions from the case dynamics matrix and causal maps are combined and represented by the summary map below (Figure 35):

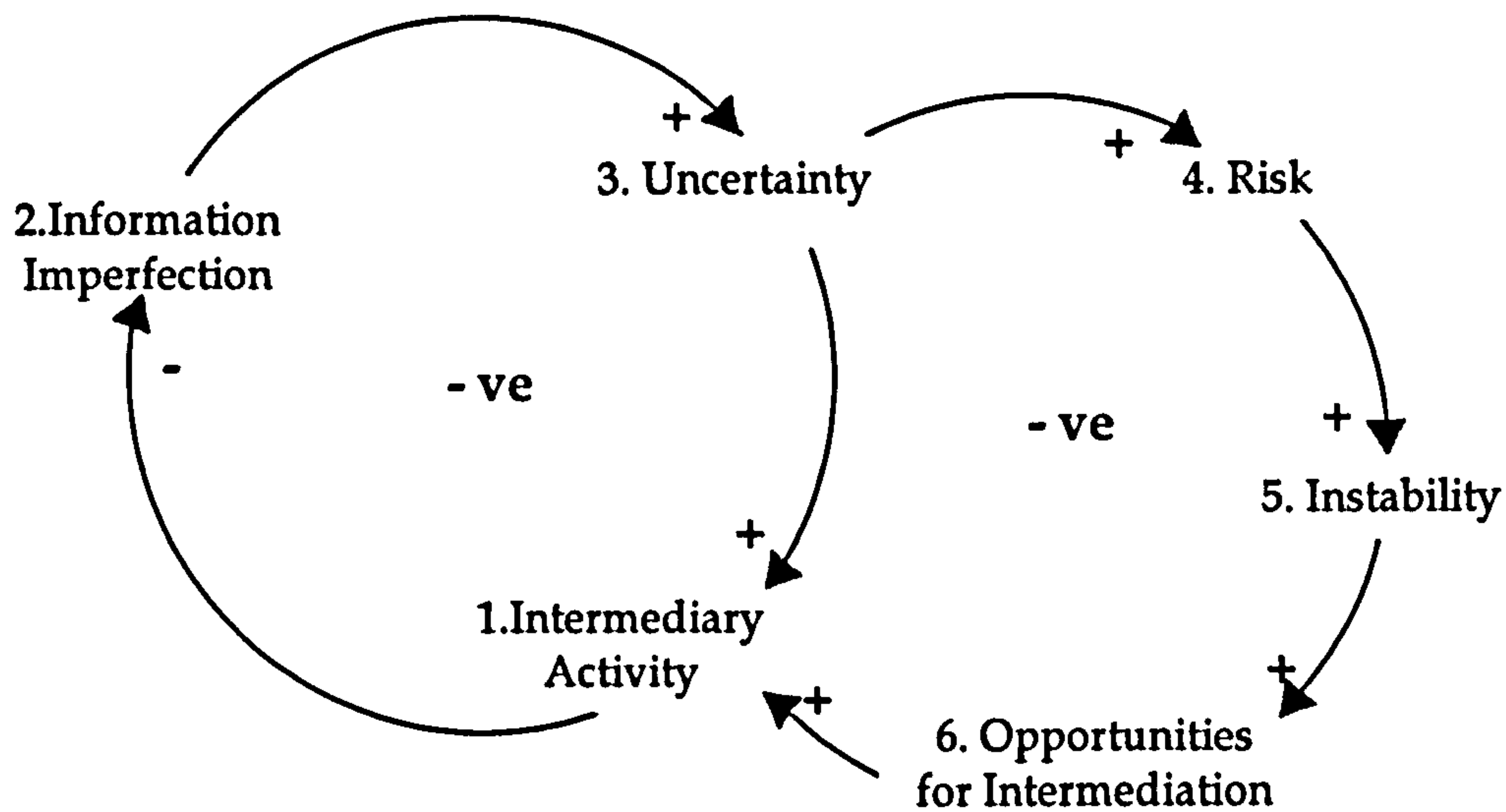


Figure 35: Information imperfection, instability and intermediation causal map

These summary maps are also accompanied by descriptive text:

Box 3: Narrative text accompanying information imperfection, instability and intermediation causal map

The adoption of intermediary activity, or reference (by buyers) to intermediaries is consistently seen in the data has a way of coping with uncertainties- defined here as not having enough information or information imperfection. From the causal maps and matrices these included not having enough information about, the availability of a particular colour of thread in the market, the behaviour of weavers when presented with large sums of money, the ability of buyers to pay for their order, and the commitment of the buyer to the design characteristics of their order.

It was therefore concluded (in line with the supposition of the conceptual framework) that the ²information imperfections in the industry determine the ¹intermediary activities that are observed. It was also concluded that the information imperfections also contribute to the ⁴risks faced by participants in the industry and are (as a result) part of the causes of ⁵instability in the market. This instability creates ⁶opportunities for intermediation, and result in an increase in ¹intermediary activity.

This section (section 9) has outlined with examples the methods used in analysing data collected during the fieldwork. The next section focuses on threats to the validity of the research; it identifies the threats that are applicable to the research and discusses measures taken in reducing them.

10 Validity and Reliability

Validity is described by Maxwell (2005) as being the final component of research design. It refers to the authenticity of the outcomes of the research and is not guaranteed by following prescribed procedure; rather validity threats⁴⁴ are minimised by evidence (and not methods) – as noted by Maxwell “methods are only a way of getting evidence that can help rule out these threats (2005, p. 105).

Unlike quantitative research in which controls to deal with both anticipated and unanticipated validity threats can to an extent be designed in advance to the study; qualitative researchers generally deal with such threats once the study has commenced, using evidence collected during the research to rule-out “alternative hypothesis”. With this in mind, Maxwell (2005) recommends that specific threats be identified and descriptions of how approaches will address these specific threats be documented (rather than merely stating generic standard approaches available in literature). To this end, the various threats to the validity of this study have been identified. These have been considered and various methods of getting information that can help rule out as many threats as possible have been developed. Some of these threats can however only be acknowledged and highlighted.

10.1 Researcher Bias

This refers to the extent to which a researcher’s value and expectations influence the conduct and conclusions of the study and reducing the

⁴⁴ Validity threat is defined by Maxwell as “a way you might be wrong” (2005, p. 106).

negative impact of this on the research (Maxwell, 2005). This is about explaining your possible biases and how they will be dealt with during the research.

Various types of micro-industries are prevalent in south-western Nigeria and could have been used for the case study; these include the pottery, soap manufacturing industry, mat weaving, and fabric weaving industries. The researcher chose the fabric weaving industry because, having family members and friends involved in the trade, it was an industry she believed she could get access to. This in turn raises issues on the validity of the sample and participants, in particular their motivations for participating in the study and the quality of information obtained from them. Such threats are perceived greater if referred participants associate the researcher with an unbalanced power relationship, for example a weaver associating the researcher with a powerful intermediary. This threat was controlled (although not eliminated) by describing the objectives of the study in detail to the participants, and also by emphasising and ensuring the confidentiality of interview transcripts. Another strategy used was to purposefully not select individuals that were associated with a contact; so if the researcher interviewed an intermediary she did not ask for an introduction to the intermediary's weavers⁴⁵.

10.2 Data Lost in Translation

This threat refers to the inaccuracy or incompleteness of collected data and refers in this case, particularly to data generated during interviews that have been conducted in a language other than English. A mitigating strategy was to tape such interviews. Although taping of interviews presents its own threats including the possible withholding of information due to mistrust,

⁴⁵ It is however interesting to note that the researcher independently established contact with weavers that worked for or had worked for intermediaries that had also been interviewed.

there is a lot more detail that can be potentially lost by not taping interviews. Another technique used in minimising this threat was 'respondent validation' (Maxwell, 2005; Miles and Huberman, 1994). This involves asking for feedback on interview transcripts and results from the participants and was achieved in this research by summarising the shorthand maps developed during the interview with the interviewee.

10.3 Interpretation

This refers to the threat of imposing one's own meaning of data rather than understanding the perspective of the people studied and the meanings they attach to words and actions (Maxwell, 1996). Three main strategies were employed for dealing with this. Pilot studies were conducted to confirm that questions are clear, not leading or closed, and give participants the opportunity to reveal their own perspective. Once recorded, data generated from the interviews were also reviewed with participants to ensure that their views are adequately represented and descriptions made reflect their experiences (this is referred to as 'member checking'). Lastly, the set of analytical procedures prescribed by the grounded theory approach recommends that memos be kept during the coding process. These memos are consistently referred to during data analysis to track the origination of the categories and sub-categories identified, ensuring that they came from the data rather than the researcher.

10.4 Discrepant Data

This threat refers to not collecting or paying attention to discrepant data, or not considering alternative explanations or understandings of the phenomenon being studied (Maxwell, 1996). This amounts to ignoring data that does not fit into the research's conclusions and short of making conscious efforts to collect discrepant evidence and negative cases, it is difficult to come up with strategies for this threat; particularly as such

discrepant data may at times be themselves flawed. However, whenever identified, discrepant data have been reported in the results section for readers to evaluate and draw conclusions upon.

10.5 Generalisation

This refers to flaws in generalising data due to chance associations and systematic biases that can result from the use of a specific method of data collection, and is also referred to as “external validity” (Yin, 1994). Triangulation (that is the collection of data from a diverse range of individuals and occasions, using a variety of methods) helps to reduce this threat. So data collected through interviews are analysed with data collected through direct observation and documents relating to prior studies of the case industry. It should however be noted that generalisation is treated differently in qualitative research particularly in this research where a single case involving a small number of individuals are being studied. As Yin (1994) emphasises, in case studies (particularly single case studies) the aim is to generalise a particular set of results to some “theory” rather than to generalise the findings of a sample to a larger population.

10.6 Reliability

“The goal of reliability is to minimize the errors and biases in a study.” (Yin, 1994, p. 36). Repeatedly obtaining the same result using the same methodology; the stability of an observation or result over time; and obtaining similar (but not identical) results within a defined time period are all expressions of reliability (Kirk and Miller, 1986). Reliability can be defined as “the degree to which the finding is independent of accidental circumstances of the research” (Kirk and Miller, 1986, p. 20) and a way it can be enhanced is through documentation of procedures used in attaining data and results. Notes recorded in a research journal were the means by which the context of data collection and steps taken in data analysis were captured.

This to help in ensuring that another investigator can conduct the same study and reliability will then be assessed according to whether the same findings are obtained.

11 Conclusion

The introduction to this chapter highlighted the role conceptual frameworks play: in ensuring that the objectives of the study are met, in developing and selecting realistic and relevant research questions and methods, and in identifying potential validity threats to the research's conclusions. By consistently making references to the conceptual framework of this research, this chapter has identified and discussed the methodology adopted in conducting this study; it described the design of the case study and provided several examples to explain the methods adopted for data collection and analysis. The chapter concluded by highlighting the steps that were taken to reduce identified threats to the validity of the selected methodology.

Chapter 6 Case Industry

1 Introduction

This thesis is concerned with investigating the role of telecommunications in economic development. The literature review presented in chapter two of this thesis summarised prior research and thinking on this role and illustrated that investigations into the relationship between telecommunications and economic development has focused predominantly on the macro-level. This study takes a micro-level approach, and its aim is to identify and document the effect telephones have on the efficiency with which trade is organised and conducted within a specific (case) industry. However, whilst accepting that making links between micro-level impacts and macro-level effects is tenuous the relevance of the findings of this research will also be significant at a more macro- and developmental level and it is in the selection of the case industry that the research seeks to achieve this.

The selected case industry operates within the *informal economy* of a developing country. This economy is an important and significant contributor to the economic fortunes and development of its participants (ILO 2002). Although there is debate as to whether and to what extent the informal economy contributes to poverty alleviation⁴⁶ this research aligns with the stand that:

“Informal sector micro- and small-enterprises are now directly linked to the main objectives of development; increased production, employment and wealth creation, and as a key ingredient in poverty reduction.” (Palmer, 2004, p. 31)

Technology that enhances the activities of participants engaged in the informal economy can therefore be said to enhance the economic

⁴⁶ See Palmer (2004) for a summary of both sides of this debate

development potential of such participants. Thus by examining the manner in which telecoms can be used to enhance the economic development of an industry, this research sits within the broader context or field of 'development studies'; specifically the branch focused on how technology can be used to deliver and/or attain development goals.

A critical part of assessing the effectiveness of these tools for development rests on the ability to determine when people and societies are truly better off. Economically such assessments of effectiveness are tied to indicators of poverty alleviation; a key aspect of which is income generation. For the majority of poor people in developing economies income is generated by working in micro- and small- enterprises in the informal economy. The performance of such enterprises is greatly enhanced by access to relevant information and by the ability by participants to act upon such information. Telecoms help such enterprises to economise on the cost of obtaining and communicating information thereby improving their efficiency and empowering the poor that are dependent on them.

The industry chosen for the study falls within the category of micro- and small-enterprises. This research investigates the role of telecommunications in economic organisations engaged in the production and marketing of *Aso Oke*, a textile associated predominately with the Yorùbá people of southwestern Nigeria. Unlike some other African weaving traditions, *aso oke* is characterised by a continuous process of design change driven predominantly by the demands of fashion (Clarke, 1999). Its ability to respond successfully to this demand despite competition from outside markets, changing technologies, and the lure of modern-sector occupations, has resulted in a vigorous and resilient industry (Wolff and Wahab, 1995). Thus (as elaborated in the subsequent sections) participants from other cultural orientations, both within and outside Nigeria, have become involved

in the industry, bringing to it their diverse styles, skills and techniques. The focus of this research is therefore not limited to a specific ethnic group, region or a particular production technology/technique. Instead, the research has demand as its starting point and focuses on the composition and dynamics of the organisational structures (mediated by telecoms) that have been created to satisfy and promote demand.

This chapter begins with an explanation of the rationale for using the *aso oke* industry as the case industry. First, a brief description of the informal sector of developing countries and its ties to economic development is provided. This is done to highlight the economic potential of the case industry. Second, the African clothing and textile⁴⁷ industry in general is discussed and is followed an introduction to the *aso oke* industry in particular. This introduction will include a brief overview of current thinking on the evolution of the industry, and the broad categories of participants that make up the industry. The ways in which these participants interact is the focus of the third part of this chapter. These interactions highlight the reliance on communication networks and the spatial nature of the industry. These are characteristics that make the industry suitable for studying the impact of telephones.

In line with the research's objectives, an economic perspective of the industry has been adopted, which is in contrast to the more archaeological or ethnographical foci commonly found in literature about African textiles (see various editions of the journal *African Art*; Clarke, 1999; Picton, 1995). This means that the organisation of production and processes of trade are given greater consideration in this thesis than (for example) the history of the

⁴⁷ Textiles and cloths although generally used interchangeably in general literature, differ in thesis in that the term 'cloth' is used to define fabric or material that is produced by a variety of means (weaving, knitting, pressing, or felting of natural or synthetic fibres). 'Textile' on the other hand refers to cloth that is manufactured by weaving or knitting.

industry, its cultural evolutions and differentiations, tools and techniques etc. For example, section 4.1 draws from the findings of prior research on the economic viability of the industry in discussing the way in which the industry functions as an economic entity. Nevertheless, factors such as cultural history (particularly in reference to the historical organisation of the industry by gender) have influenced and continue to influence the economic functioning of the industry. As such the impact of some of these factors to the economic viability of the weaving sub-sector has also been discussed.

In addition to prior research on the *Aso Oke* industry, this chapter also draws on data obtained during an exploratory study of the industry that was conducted at the initial phase of this research. The objectives of the exploratory study were to gain an understanding of the process of trade within the industry, and to identify the different actors within the trade and the way in which they performed their roles. The findings of this study are reported as part of section 5 using materials and information flow, and process diagrams (see Figure 42, and Figure 45 to Figure 47). The chapter concludes with a discussion of the different organisational forms identified during the exploratory study. The conclusion (in line with the conceptual framework) focuses in particular on the role of intermediaries and intermediation in the industry.

2 The Informal Sector

Developing economies are dualistic in nature. On the one hand, the methods of production, consumption patterns, business organisation, levels of personal sophistication, and interrelationship between units of the economy, are formal, organised, and legal. At the same time, these same elements also exist in an informal state, unquoted in legal terms and largely unchanged since the society in which they are practised came into existence. What distinguishes these two natures of the economy are not the activities carried

out in them but the conditions under which the activities are performed. Understanding these conditions, the factors that constitute them and the ways in which they can be improved is important given the large size of the informal sector in developing countries. Not only does the sector constitute on average 41 percent of the GDP of developing countries (Schneider, 2002), it also accounts for between 20-40 percent of employment (Levenson and Maloney, 1998). These figures are much higher in sub-Saharan Africa (see Table 11 and Table 12) where it is estimated that the informal economy is responsible for up to 93 percent of all new jobs (Chen, 2001). Job creation figures for select sub-Saharan countries are reported by Palmer (and references therein):

“...in Cameroon (1992) 80% of all new jobs were created in the informal sector; in Tanzania about 60% of enterprises operate in the informal economy; in Kenya the informal economy accounts for about 40% of urban employment and is growing at 9% per annum; in Ghana the informal economy employs 89% of the labour force (including 56% in agriculture and 21% in retail trade); and in Nigeria, the informal economy employs a third of the urban labour force.” (2004, p. 36)

The informal sector therefore represents an important part of the economy (particularly the labour market) of developing countries, and plays a key role in employment creation, production and income generation (Husmanns and Mehran, 1999). The question remains as to how to harness the potential of informal economies for the benefit of those that depend upon them and the country's economy in general.

According to Gallup *et al.* (1998), a country's aggregate economic growth is highly correlated with growth in the incomes of the segment of its population that is poor. The phenomenon whereby economic growth occurs concurrently with increases in relative poverty has been attributed to delays in the rate at which benefits from general development policies trickling down to the poor (Potter *et al.*, 1999).

One suggested method of countering this delay effect is to focus economic development policies on specific 'target' populations and to include poverty alleviation goals as a key part of such policies (Sarkar and Kumar, 2002). The Global Development Research Center (GDRC, 2005) asserts that the goal of poverty alleviation, coupled with job creation, is key for overall development. The informal sector thrives for precisely the same reason; therefore - to alleviate poverty and create jobs (Oberai and Chadha, 2001).

Table 11: Contribution of informal sector to GDP in selected countries in sub-Saharan Africa

Country	Year of Survey	Informal sector GDP as percentage of non- agricultural GDP
Benin	1993	43
Burkina Faso	1992	36
Burundi	1996	44
Cameroon	1995-6	42
Chad	1993	45
Cote d'Ivoire	1995	30
Ghana	1988	58
Guinea Bissau	1995	30
Kenya	1999	25
Mali	1989	42
Mozambique	1994	39
Niger	1995	54
Senegal	1991	41
Tanzania	1991	43
Togo	1995	55
Zambia	1998	24

Note: Due to difficulty in measurement of informal economic activities, these percentages should be taken as rough guides rather than precise values

Source: ILO (2000, p. 24) in Palmer (2004) "The informal economy in sub-Saharan Africa: Unresolved issues of concept, character and measurement" p. 32

Table 12: Informal sector contribution to urban employment

Country	Year of Survey	Informal sector contribution to urban employment (percentage)
Benin	1992	47.9
Botswana	1996	19.3
Cameroon	1993	57.3
Cote d'Ivoire	1996	52.7
Ethiopia	1996	33.0
Gambia	1993	72.4
Ghana	1997	78.5
Kenya	1995	58.1
Madagascar	1995	57.5
Mali	1996	71.0
Mauritius	1992	24.0
Morocco	1988	28.2
South Africa	1995	17.4
Tanzania	1995	67.0
Tunisia	1981	38.6
Uganda	1993	83.7
Zambia	1993	80.7

Note: Due to difficulty in measurement of informal economic activities, these percentages should be taken as rough guides rather than precise values

Source: ILO (2000, p. 285) in Palmer (2004) "The informal economy in sub-Saharan Africa: Unresolved issues of concept, character and measurement" p. 36

There is therefore similarity in objectives and by improving the efficiency of the informal sector, not only are jobs created and maintained, disposable income is also increased and there is a contribution towards poverty alleviation. Participants in the informal sector are therefore appropriate target populations for development initiatives (Levenson and Maloney, 1998; Fapohunda, 1985) and technology that can contribute to the efficiency and viability of informal markets need to be assessed for inclusion in such initiatives.

2.1 Does Telecoms help to improve informal enterprises?

The effectiveness of the enterprises that operate in the informal sector is influenced by the same economic principles of firm behaviour that affect their counterparts in the formal sector (Laoyza, 1999; Levenson and Maloney, 1998). Their ability to generate income through market activities is greatly enhanced by the ability to access, distribute and act upon information (Stiglitz, 1988). Telecommunications contributes towards this ability by reducing the cost of obtaining and distributing information. Furthermore, because telecom also provides opportunities for increased interaction and coordination it also contributes towards the sharing of knowledge which can help to improve the use of available information (Cohendet et al., 1999).

This thesis hypothesises that the improved communication and coordination benefits generated by access to telecoms translate into increases in organisational efficiency and strengthen the abilities of enterprises to manage/support even higher levels of economic activity. This results in increased opportunities of profitability for such enterprises and the people that are dependent on them.

3 The African Clothing and Textile Industry

Much of what has been written about the African clothing and textile industry has been from an anthropological perspective than from an economic perspective. Recent economic studies on the industry have concentrated on the application and impact of trade initiatives (in particular the United States' African Growth Opportunity Act) on the export potential of textile and apparel industries in sub-Saharan Africa (Nicita and Razzaz, 2003; Roberts and Thoburn, 2003). These however refer to large and often formalised companies and not the informal enterprises that are the focus of this research.

Economic accounts of types of enterprises that are the focus of this research can be found in:

- a. Bray's (1969) study of textile weaving in Iseyin, Nigeria
- b. Liedholm and Chuta (1976) study of *Gara* cloth dyeing and tailoring activities in Sierra Leone
- c. Shea's (1977) account of the dyed cloth industry in 19th century Kano, Nigeria
- d. Aronson's (1989, 2001) studies of textile weaving in Akwete, Nigeria
- e. Byfield's (1993) study of the *Adire* industry in Abeokuta, Nigeria
- f. Clarke's (1999) study of *Aso Oke* weaving among the south-western Yoruba's in Nigeria
- g. Perani and Wolff's (1999) account of the impact of patronage on cloth and dress in Africa.

The preceding list of literature shows that economic accounts of the industry are usually dated, with significant timeline gaps. Some (like Clarke, 1999) have theorised that these gaps may be reflections of the decline and resurgence of the industry in response to the economic health of the nations in which they are located. Regardless, available studies have been consistent in identifying the clothing and textile industry as one of the most (economically and culturally) important activities undertaken in Africa. This economic importance can be described using two factors: the geographic expanse covered by the textiles produced, and the numbers of people engaged in their production.

3.1 Geographic Reach of Textiles

Liedholm (1982) cites the example of the Western Sudan Empire⁴⁸ (Figure 36) in illustrating the frequency with which textiles were used as a medium of exchange, and the extent to which they formed the basis of a large export

⁴⁸ The Western Sudan Empire (500-1000AD) encompasses parts of present-day Gambia, Guinea, Mali, Senegal, Burkina Faso, Mauritania, eastern Niger, and northern Nigeria.

trade. Such was the acceptance of textile as a medium of exchange and geographic expanse covered that by the 12th century, Western Sudan cotton cloths were being worn in Europe (Liedholm, 1982). With respect to the economic returns achieved through their sale, Shea (1977) notes that as of the 1850s yearly cloth sales of the northern Nigerian state of Kano amounted to some £40,000. In terms of people engaged in production, it is estimated that in the mid 19th century there were about 600 weavers operating in Bamako - the capital city of Mali (Liedholm, 1982).

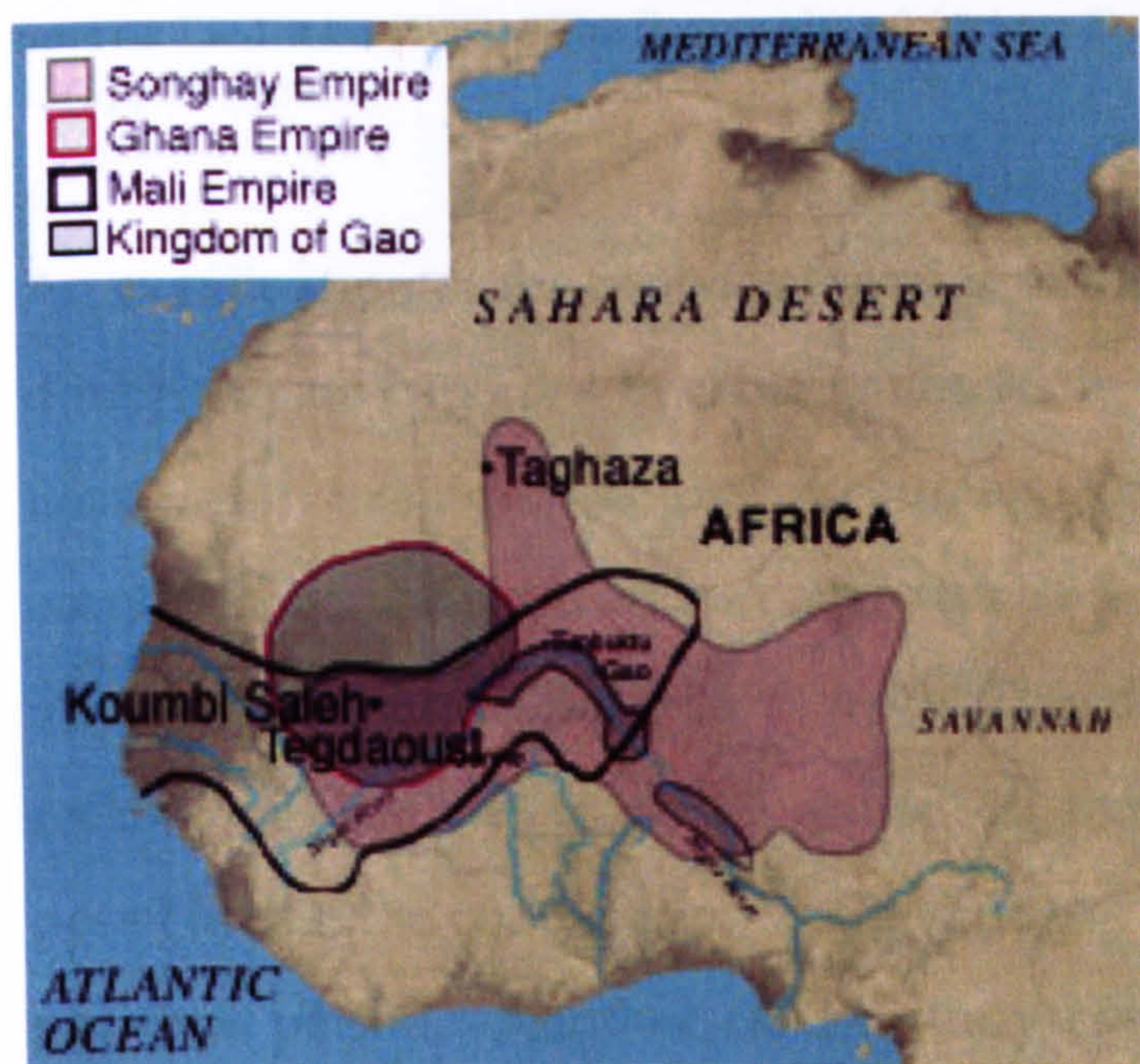


Figure 36: Boundaries of three Western Sudan empires at their height: Ghana, ca. mid-eleventh century; Songhai, ca. sixteenth century; and Mali, ca. fourteenth century

Source: Source: http://www.metmuseum.org/toah/hd/wsem/hd_wsem.htm

3.2 Number of People Engaged in the Production of Textiles

Small-scale artisans involved in tailoring, weaving, spinning and dyeing dominate the African clothing and textile industry. The activities these artisans perform also constitute the broad categories into which the industry is commonly subdivided. Most of the businesses that make up the industry are usually very small in size, for example, in 1970s Sierra Leone the average clothing and textile enterprise engaged approximately 2 persons and 99% of the firms employed less than 5 people (Liedholm and Chuta, 1976, 1979).

Nevertheless, these establishments consistently generate the largest share of small-scale⁴⁹ industry employment (Table 13).

Table 13: Employment in small-scale clothing enterprises in selected African countries

Country	% of people employed in small-scale clothing enterprise*	Source	Year
Western Nigeria	51.7	Aluko, Oguntaje&Afonja	1972
Senegal	45.3	Senegalese Office of Statistics	1976
Cameroon	41.3	Steel	1979
Ghana (Accra)	33.0	Steel	1977
Sierra Leone	31.3	Liedholm	1982

* Stated figures are as a percentage of overall employment in small-scale enterprises.

Source: Liedholm (1982) "The Economics of African Dress and Textile Arts" African Arts 15(3) p.71 (note 3)

An examination of the broad categories of the textile industry shows that the dominant sub-category in most countries is the small-scale tailor. In Sierra Leone, for example, tailors accounted for 78% of small-scale clothing employment, spinners and weavers for 17%, and *Gara*⁵⁰ dyers accounted for 5% (Liedholm and Chuta, 1976, p. 4). This data is however dated, and more recent ones are yet to be identified in accessible formats. It is therefore possible that the composition of the industry varies according to country and not time period. Another earlier study conducted in Bouake, Ivory Coast confirms the high proportion of tailors in the textile industry; here tailors made up 51% of the textile enterprise and weavers 44% (Joshi, Lubell, and Morley, 1969).

⁴⁹ Small-scale is defined here as less than 50 employees.

⁵⁰ *Gara* is the Madingo word for the traditional indigo dye used in Sierra Leone cloth production

4 The Aso Oke Industry

Aso Oke is a textile form that is generally associated with the Yorùbá people; the majority of whom live in the south-western region of Nigeria (see Figure 37), although substantial communities also exist in Benin, Togo, Sierra Leone, Cuba and Brazil.

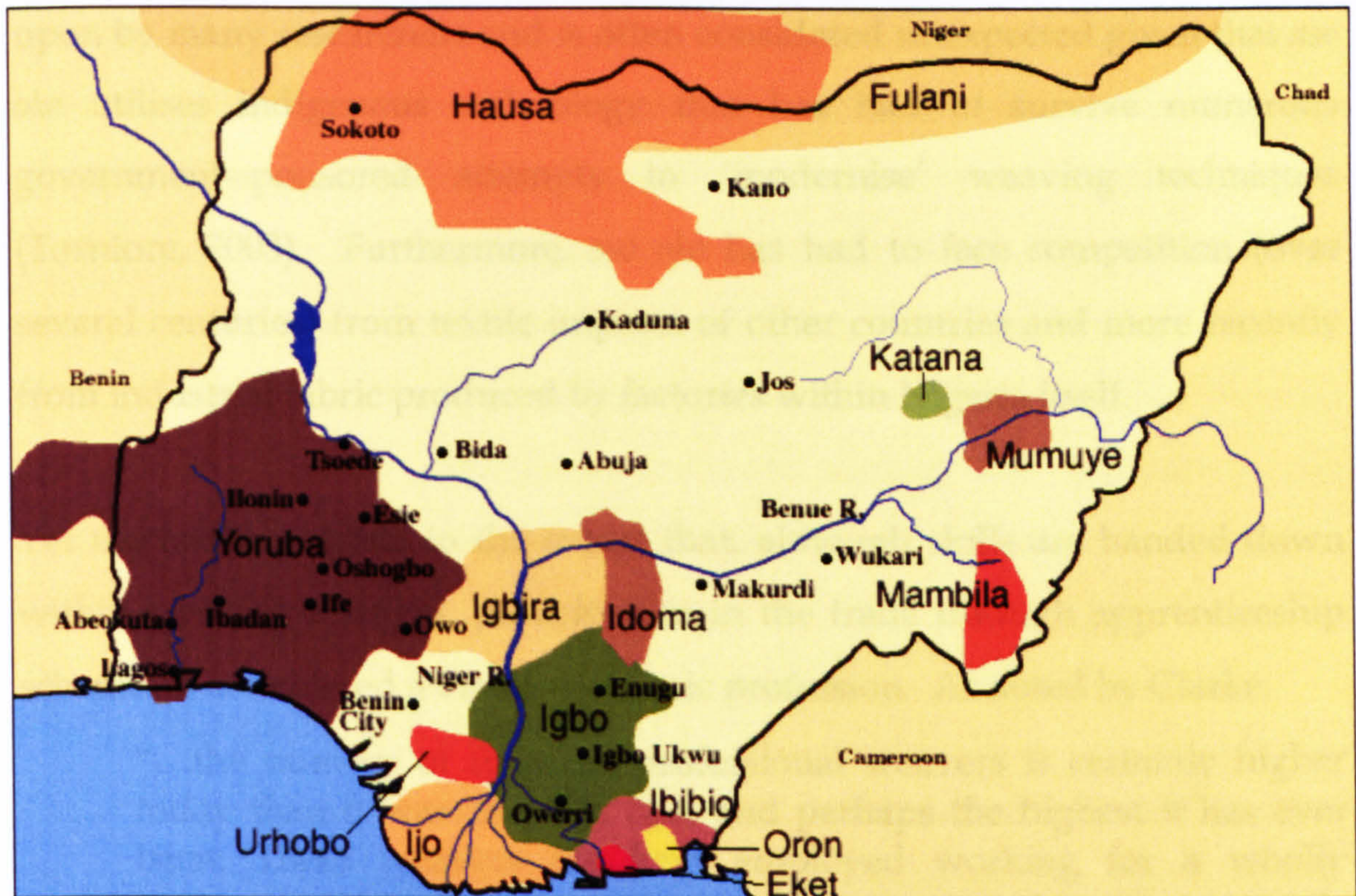


Figure 37: Cultural groupings in Nigeria

Source: <http://www.uiowa.edu/~africart/toc/countries/Nigeria.html>

According to Clarke (1997) *aso oke*, literally meaning “cloth from above” is interpreted as either cloth from upcountry - i.e. the interior of the country, or as prestige or high status cloth. In terms of method of production (particularly the type of loom used in manufacturing), not much distinguishes this textile from that of other African traditions and as Clarke (1999) notes, the name *aso oke* is used to refer to all locally woven cloth.

Historically *aso oke* has involved and continues to involve activity on both a larger and a smaller scale than the Yorùbá. In its early stages it was set

against a background of large scale international textile trade - 16th century European merchants brought quantities of the cloth from Ijebu and Benin, whilst in turn imported large quantities of European and North African cloth. Overlapping this international trade was the internal African cloth which still continues to the present day and forms the backbone of demand (Clarke, 1999; Perani and Wolff, 1999). The survival of the textile has been remarked upon by many researchers and is often considered unexpected given that *aso oke* utilises indigenous technology that has had to survive numerous government-sponsored attempts to 'modernise' weaving techniques (Torntore, 2003). Furthermore, *aso oke* has had to face competition (over several centuries) from textile imports of other countries and more recently from industrial fabric produced by factories within Nigeria itself.

Yet the textile persists to the extent that, although skills are handed down within weaving lineages, participation in the trade through apprenticeship schemes is considered a viable economic profession. As noted by Clarke:

"...the number of full-time professional weavers is certainly higher today than it was 20 years ago, and perhaps the highest it has ever been. These weavers are kept employed working for a wholly indigenous patronage, with virtually no tourist or expatriate demand." (1999, p. 4).

4.1 The Organisation of the *Aso Oke* Industry

4.1.1 Production

Production of cloth and textile in Africa is, predominately family/kinship orientated and communal in nature. With respect to kinship, the skills required for weaving textiles is often passed onto younger generations through family or community ties, resulting in whole (geographic) areas being associated with the skill. However, various development initiatives⁵¹

⁵¹ Renne (1997) examines the impact the Textile Development Scheme (a mid 1940s colonial development project) had on weaving in the Ekiti area, Nigeria. Aina (1995) makes mention

and increasing demand for traditional textiles have resulted in formal apprenticeship schemes that facilitate the acquisition of weaving skills by non-family members and those who are not indigenes of weaving areas (Phillips and Titilola, 1995).

Textile weaving also tends to occur within a communal structure. For example, Clarke (1999, 2001) describing the organisation of textile weaving in southwestern Nigeria identifies a 'masterweaver' who controls a small group of apprentices and dependent weavers⁵². The masterweaver supplies the raw materials, confirms which designs to produce, makes small payments to the weavers, and owns the finished cloth (Clarke, 1999; Phillips and Titilola, 1995). When the fulfilment of orders requires the assistance of other weavers and groups, flexible associations between groups and individuals are established. These associations are adaptable and change according to demand.

4.1.2 Marketing and Sales

The organisation of the marketing of *aso oke* incorporates a limited range of channels. Often textiles are produced only in response to a specific order, and as such inventory of goods awaiting sale are rarely held. In cases where some production is undertaken without specific orders and inventory built up, products are sold either at a shop or through intermediaries who retail the products. In some cases, these intermediaries will not pay for the cloth until it is sold, a practice that often causes producers/weavers to face a severe shortage of working capital.

of Better Life Multipurpose centres, diocesan training schools and government-sponsored vocational schools, when describing weaving skill acquisition in the Owo area, Nigeria. Weaving centres also exist in Akwete, Nigeria.

⁵² Groups usually vary between two and ten, although some weaving groups number as many as thirty (Clarke, 2001, p. 118).

This dependence on orders and lack of more formal market organisation affects the dynamics of the industry. Aina (1995), based on interviews conducted with textile weavers in the border town of Saki (in Nigeria), identified the lack of an organised market in the area as responsible for limiting the market channels available to the weavers. This he said perpetuates an increasing dependence on specific orders and thus leaves weavers open to trade and demand fluctuations that contribute to the instability of their enterprise. Organisation is therefore an important influencing factor on the viability of the industry.

4.1.3 Implications

The organisation of production, marketing and sale contributes to the viability and vibrancy of the industry by providing a platform for the occurrence and dissemination of information and product innovation. In textile weaving, motivation for design diversity comes from the interaction of masterweavers with intermediaries and their customers (Clarke, 2001). Through associations with intermediaries and input from buyers, weavers obtain knowledge of current design requirements and can position themselves to cater to demand. The ability to effectively network is therefore a critical competence in this industry as it provides the avenue through which information relating to products can be acquired and shared. Telecoms as a communication network is therefore of relevance to the industry.

4.2 Factors Influencing the *Aso Oke* Industry

4.2.1 National Economic Activity

The major source of demand for African textiles is African consumers (Clarke, 1999). The absolute amount of clothing demanded therefore depends on income generated by these households and consequently, the success of the clothing industry is closely tied to the overall level of economic activity. This tie to economic activity is two-fold and at first glance appears contradictory.

During periods of uncertainty and high unemployment, Renne (1997), O'Hear (1990) and Bray (1969) postulate that the number of people involved in the industry grows dramatically as a result of lack of alternative employment. Demand for locally produced (and often cheaper) cloth is also reported to be high during such periods as people economise on cost. Economic depressions are therefore often associated with the vibrancy of the industry and economic growth is associated with decreasing preference for local cloth, increases in alternative occupations, and an increasingly educated population (thus diverting potential apprentices away from the industry). Under conditions of economic growth, the industry is said to suffer adversely and some have even predicted the eventual demise of the market as African countries begin to meet their development goals (Bray, 1969). However, as Liedholm notes:

"These assertions have generally been made ... unencumbered by solid information" (Liedholm, 1982, p. 74).

Clarke (2001) agrees, noting that although the factors associated with national economic growth has had negative impacts on some aspects of the industry and specific geographical locations, other areas appear to have profited under the same conditions. Thus Clarke reports decreases in women weaving and *Adire*⁵³ dyeing amongst the Ijebu and Owo Yorùbás under the same conditions in which the weaving of neighbouring peoples such as the Nupe and Ebira continued to flourish. Periods of national economic growth have also been associated with increases in cloth and textile production; under these circumstances increase in production is often accompanied by increases in demand for product quality and/or innovation.

4.2.2 Climatic Seasonality

Another important factor affecting the fortune of the *Aso Oke* industry is climatic seasonality. Nigeria, like all other West, Central and East African

⁵³ "Adire", literally "we tie and dye", is an indigo-dyed Yorùbá textile form.

countries, experiences two seasons, the dry and wet or rainy seasons. Seasonality impacts the industry in two main ways - first on working conditions for production, and second on consumer demand.

Studies (Clarke, 1999; Phillips and Titilola, 1995) have shown that for a variety of reasons - including space constraints, limited capital resources to build permanent structures, and weaving technique employed - textile production occurs either in open spaces or under make-shift/temporary structures that do not provide adequate shelter from the rain (see Figure 38 below).



Figure 38: Ghanaian weavers at work [New Oko-Oba, Lagos State 2003].

During the rainy season therefore, production is disrupted and output reduced. Consumer demand also tends to peak during the dry season, when festivals and holidays tend to predominate and also when rural purchasing

power tends to be the highest⁵⁴. The impact of seasonality on the industry can be quite pronounced; Bray noted that 80% of the weavers in Iseyin, Nigeria, experience a cutback of over 20% during the rainy season (1969, p. 548).

4.2.3 Gender and Weaving Looms

In general, research on textiles associate weaving on narrow strip looms (as depicted in Figure 38) with men and weaving on vertical looms with women (see Figure 39).



Figure 39: Weaving on vertical loom

Source: Fayemi, O. A. "Voices from Within: Photographs of African Children"

⁵⁴ Rural areas are predominantly agricultural communities and the dry season coincides with the harvest and sale of produce at markets. Purchasing power is therefore higher at this period of the year.

This holds true in some regions, for example among the Igbo in eastern Nigeria only women weave on vertical looms. However, in other regions – e.g. amongst the central Oyo Yorùbás and in northern Nigeria women’s weaving overlaps with that of men using the double heddle loom (Clarke, 2001). Also, Renne (1992) noted that both men and women perform Bunu Yorùbá weaving on the upright looms, and it is claimed that men once performed weaving on upright looms amongst the Ijebu Yorùbás although it is now exclusively performed by women (Aronson, 1992).

Gender differentiation is relevant to this discussion for two reasons. First, vertical looms and the process of weaving on them does not require as much space as horizontal looms and as such this type of weaving is often performed indoors. Weaving on vertical looms is therefore not affected by the same climatic constraints on production as horizontal looms. Weavers using this type of loom are thus potentially more productive than horizontal loom weavers⁵⁵.

Second, adaptability by genders to different loom types (after taking into account cultural limitations) has been used to explain observed variations in the fortunes of different weaving regions. Yorùbá *aso oke* weaving on the narrow-strip loom is one of the most vibrant and successful textile industry in Africa today (Clarke, 2003). Whilst in the past, women of this culture were associated with vertical looms; dramatic decline in demand for textile they produced resulted in their adoption of the horizontal loom⁵⁶. This contributed to increasing competition within the *Aso Oke* industry and impacted the general vibrancy of trade in the textile. More importantly, in

⁵⁵ There are however caveats to this argument. Weaving on the vertical loom is slower than on horizontal looms and textile produced using these vertical looms have limited design repertoire (see Clarke, 1999).

⁵⁶ See Aronson’s (1992) study of *Popo* weaving in Nigeria, and Clarke’s (1999) PhD thesis on the evolving tradition of hand-woven textiles in south-western Nigeria.

light of the economic development focus of this thesis, these female weavers have also been able to increase their ability to generate income due to the de-emphasis of gender roles in this industry (Torntore, 2001 and references therein).

4.3 The Economic Viability of the *Aso Oke* Industry

Given the above discussion of the way in which production, marketing and sales activities are organised in the *Aso Oke* industry and some of the factors that exert an influence on the industry, the question of whether or not *Aso Oke* is economically viable on a commercial scale needs to be addressed. Detailed studies that conclusively answer this question are not available, however authors like Liedholm (1982) and Clarke (1999) assert that the industry is viable beyond a level of subsistence and offers appreciable commercial capabilities. Others, for various reasons believe otherwise. Renne (1997) limits the economic capabilities of the industry to subsistence and noted that it was merely

“...something of an economic safety net for young rural women, destined to be ‘successful’ only during periods of economic decline, can hardly be construed as progress.” (Renne, 1997, p. 789)

To be able to draw conclusions on economic viability, an understanding of the basic economic factors of the industry and appropriate measurements is needed. Liedholm (1982) suggests the following measurements for viability:

- a. The rate of economic profit of the enterprise - an industry or enterprise would be considered viable if the profit rate was positive after all inputs have been valued at their opportunity cost
- b. The return to the proprietor - i.e. the monetary income earned by the proprietor (which is an obvious measure of viability to the individual)
- c. The relative economic viability of the enterprise - which is measured as the extent to which a participant in the industry, due to the uniqueness of his/her skills, is a scarce resource

Costs must also be considered in assessing viability and those relating to textile production can be grouped into the following categories:

- a. Capital - According to Aina (1995) capital costs for this industry are amongst the lowest for most types of small manufacturing notes. However, based on research he conducted on four traditional micro-industries (i.e. textile weaving, mat making, soap making, and pottery making) capital outlay for the *Aso Oke* industry was the highest.
- b. Raw materials - The main costs in weaving lie in material input costs (Renne, 1997). Liedholm (1982) identifies such costs as composing about 50% of the gross output value. Costs of this input are high for a variety of reasons. Firstly raw materials for this industry are usually subject to high import duties. Secondly, retail rather than wholesale prices are paid for these inputs, and industry participants are not generally in positions to obtain credit for purchases. Large amounts of working capital are therefore required for participants to enter into or continue production (Liedholm 1982, Aina, 1995).
- c. Labour - Although clothing is a high labour intensive activity, hired labour is a very small component of the costs of the industry (Liedholm, 1982). This may be due to the relative abundance of labour (Aina, 1995).
- d. Land - Production of the fabric is often performed in communities where the weavers come from. In such circumstances land does not constitute a cost. However when production is outside the weavers home rent becomes a significant cost particularly if production is being conducted in or near urban centres.

The measurement criteria developed by Liedholm (1982) (described above) refer predominantly to the production of textiles and are adequate in assessing the profitability of engaging in the trade from the perspective of the

weaver. However, weavers are not the only parties engaged in the trade and the costs incurred in any industry are not limited to those relating to supply factors. The mere fact that the textiles once produced needs to be sold, and the exclusion of costs relating to this 'selling process' implies that the above criteria, whilst portraying an adequate picture of economic viability for the weaver, requires additional criteria to be able to postulate an answer for the economic viability of the industry.

Analysing economic organisation within the industry - in particular the manner in which information costs are reduced, provides a means of studying the economic viability of the industry. The importance of information costs has been highlighted in Chapter 3 and Chapter 4. Economic organisations employ a variety of methods in economising on information cost; this research specifically highlights the use of communication technologies (in particular telephones).

By improving upon the ability of participants in the trade to economise on information costs, communication technologies create a more 'level playing field' for the participants in the market. Thus, referring back to Aina's (1995) account of the lack of a formal market impeding the growth of the textile weavers in Saki (see section 4.1.2), the implementation of communication technologies that are accessible to all parties presents an alternative to a physical meeting place. Also important is the adoption of roles and activities previously outside the resource capabilities of some participants in the industry. So whereas a weaver would have relied wholly on a trader for orders, the application of communication technologies may give him/her direct access to customers placing the orders. It is therefore expected that, given their resources, the participants in the industry will adopt a means of trade that they believe provides them with the greatest returns.

The introduction of communication technologies therefore results in the creation of new trading environments, for which the quest for greater returns drives the supply of better communication technologies and so the cycle repeats itself. At a given point in time different organisational types will coexist due to the constantly changing environment and variation in access to communication technology.

The success of participants adequately making use of communication technologies will therefore directly impact the economic fortunes of the industry.

5 Organisational Structures and Roles in the Industry: An Exploratory study

In January 2003 an exploratory study of the organisation of the *Aso Oke* industry was carried out in Lagos, Nigeria. As stated in the introduction to this chapter, the objectives of this exploratory study were to gain an understanding of the process of trade in the industry, and to identify the different actors within the trade, the functions they perform and the impact of telephones on their performance.

Two weavers who belonged to two distinct categories participated in the study. The first was a female weaver from Akwete in Abia state (see Figure 40). Akwete is one of the last centres of a once larger tradition of Igbo women's weaving (Clarke, 2003). Akwete women use a uniquely wide version of the vertical loom, which allows for a single width of cloth to form a woman's wrapper or shawl. Although these weavers produce textiles particular and appropriate for female use, their weaving is not entirely gender specific (Aronson, 2001, 1989).



Figure 40: Map of Nigeria showing location of Abia of State

Source: http://www.lib.utexas.edu/maps/africa/nigeria_pol93.jpg

The second category consists of male weavers from Ewe. The Ewe inhabit the Volta delta area of south-eastern Ghana and western Togo (see Figure 41). They utilise a form of the narrow strip loom for weaving and produce textile in long strips that are cut to the desired length and sewn together edge to edge. Since the mid-1990s significant numbers of Ewe weavers have migrated to Nigeria in search of work (Clarke, 2003).



Figure 41: Map of Ghana showing location of Volta Region

Source: http://www.lib.utexas.edu/maps/africa/ghana_pol96.jpg

5.1 Methodology adopted for exploratory study

Due primarily to time constraints on the part of the weavers and researcher, only one representative of each category of weavers described above was interviewed for the pilot study. Two visits were made to the weaver's premises, the first was an introductory meeting at which the researcher was introduced to the weaver, the purpose of the pilot study was communicated and participation in the research sought. The manner in which interviews

were to be recorded was also communicated to the weaver and permission to take photographs was also sought.

The date, time and location of the second meeting were selected by the weaver and were entirely at their discretion and convenience. The second meeting involved the conduct of the interview. Both interviews occurred in the morning, and at the weaver's premises. During the interviews weavers were asked to describe the steps involved in seeking and/or accepting an order, through to its completion and delivery/collection. The weavers were also encouraged to talk in general about the industry so as to obtain additional information about the dynamics of the industry and peculiarities of the trade. Their perception of telephones and its potential application to their enterprise was also sought. Interviews were taped and later transcribed. The processes described by one weaver were crosschecked with that of the other weaver as well as with literature⁵⁷ for consistency. Process and material and information flow maps were then drawn to summarise and present a graphical illustration of the various steps involved in the product, marketing and sale of the textile.

5.2 Process and Flow Maps: Notation Adopted

Based on the weaver's description of their trade, a process map aggregating the variety of trade options open to the key parties in the industry is represented in Figure 42. Process maps provide visual representations of how the participants in the industry perform their activities. By following the flow of the map, the various components involved in making a trade happen, from the event that triggers the process through to the end result, can be identified.

⁵⁷ Clarke (2001) provides a summary of the organisation and process of trade in the southwest Nigerian textile industry.

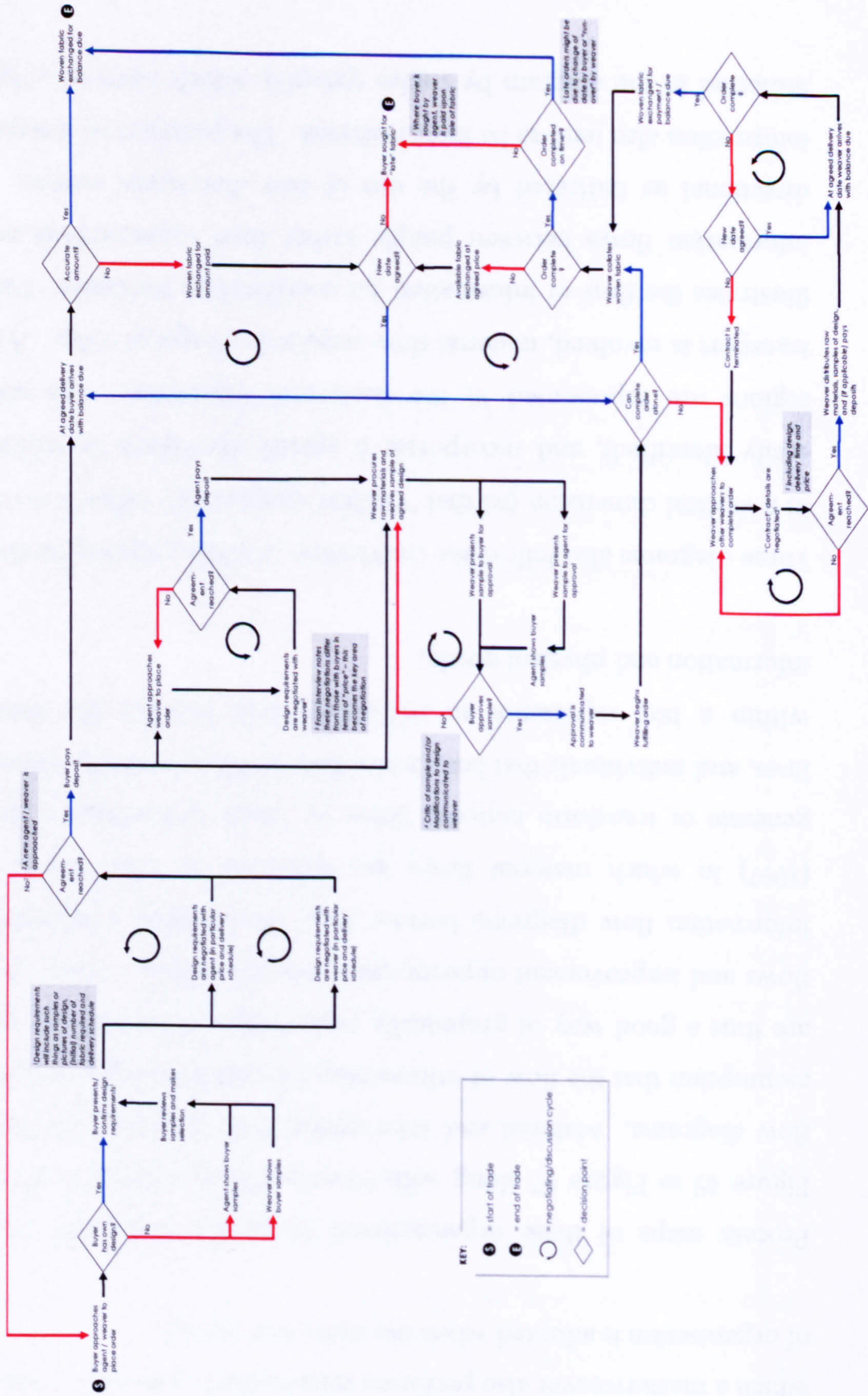


Figure 42: Order-Making to Order-Fulfilment Process Map: Aggregation of Organisational Forms

Three main ways in which trade in the textile can be organised were identified. The first is a direct exchange between a buyer and a weaver. The second is an intermediated centralised exchange in which a trader is the intermediary. The third is also an intermediated centralised exchange in which a masterweaver also performs intermediary activities. This third form of organisation is adopted when the order size is large.

Process maps of these organisational forms are presented separately in Figure 45 to Figure 47 along with corresponding material and information flow diagrams. Material and information flow diagrams are based on the assumption that the flow of information facilitates the flow of materials and are thus a good way of graphically presenting and identifying information flows and improvement opportunities between parties. These material and information flow diagrams borrow from the notation adopted by Casson (1997) in which material flows are identified as block lines, units that generate or transform material flows by boxes, information flows by thin lines, and individuals that handle the flow of information by circles. A circle within a box represents an individual that handles the flow of both information and physical goods.

These diagrams also follow the convention of portraying sequential activities in a vertical dimension (so that 'vertical integration', when it occurs, can be easily identified), and incorporate a spatial dimension in which different regions are represented in the horizontal dimension. As such, where transport is involved, material flow acquires a diagonal form. A single line illustrates the flow of information for coordination purposes. Furthermore, information flows between people rather than organisations and are bi-directional as indicated by the use of two directional arrows. Flows of information also tend to be intermediated. The presence of intermediaries is indicated in the diagram by circles (people), which have no corresponding

squares. On certain occasions, the same individual carries out different intermediation functions (for example the coordination of different groups of people for different activities) this is illustrated by an oval line drawn around the circles (see Figure 46 and Figure 47).

5.3 Roles Identified

Three main roles can be identified from Figure 42, these are: buyer, intermediary and weaver.

5.3.1 The buyer

The buyer is the individual that commissions an order and is either the consumer of the textile or is a representative of its end-users. *Aso oke* is worn by individuals primarily during ceremonious occasions and events; when several end-users of the textile exist the order is referred to as *aso ebi* (see Figure 43) and becomes as a type of “uniform”, identifying groups of people at an event. As described by Clarke:

“[*Aso ebi*] involves groups of celebrants at any event expressing their sense of group or family unity by dressing in the same pattern of fabric.” (Clarke, 1997, p. 102)

In the case of *aso ebi*, one person is (or a few people are) in charge of placing the order, collecting monies from those interested in buying the textile, paying the intermediary or weaver, collecting or receiving the finished textile from the intermediary or weaver, and ensuring that all the end-users get their fabric prior to the event at which it will be used.



Figure 43: Artistic representation of *aso ebi*

Source: Douglas Camp, *Sokari Asoebi, or Lace, Sweat and Tears*, steel, Made in London, 2005

5.3.2 The Intermediary

Aso oke is a heterogeneous, customised, occasional product; this means that the majority of buyers/consumers do not know enough about the characteristics of the product and transaction to readily make judgements about where to find weavers, who to buy from, and the transaction terms to insist upon. They therefore require some form of 'diagnostic expertise' which is made available by intermediaries. Likewise producers of the fabric (weavers) are often unsure of the specific location and design preferences of demand. Intermediation therefore plays a key role in the industry.

Casson (1990) summarises two main interpretations of intermediation:

- a. The materialistic view of the economy suggests that the essence of intermediation is production. Here intermediation is the need to combine different factor inputs in given proportions, and in quantities sufficient to exploit economies of scale.

- b. The information-based view on the other hand suggests that the essence of intermediation is the organisation of trade and this activity is performed by market-making firms or entities.

These two interpretations exist in the *Aso Oke* industry. The production-based view is displayed by masterweavers fulfilling large orders and market-maker role of the information-based view is performed by the 'agent' identified in Figure 42.

5.3.3 The Weaver

Clarke (1999) in his thesis identified three distinct classes of weavers: masterweavers, dependent weavers, and trainee weavers/apprentices. According to Clarke, masterweavers are "key figures in organising weaving within the compound⁵⁸" (1999, p. 92), they operate as independent businesses and his/her responsibilities include:

"...supplying thread (to weavers for the production of orders), selling finished cloth, allocating tasks amongst weavers and junior trainees ... which can involve a very detailed breakdown of tasks to be done ... keep(ing) costs under control by maintaining a detailed watch on how much thread is used ... (they) exercise limited amount of supervision over the quality of the weaving and ensure that it is proceeding fast enough to meet commitments to customers ... Masterweavers collect finished cloth and make necessary payments to weavers. They must maintain a presence in 'marketable' areas by cultivating links and meeting with customers. At the same time, they maintain a presence in their 'locality' by securing local orders and ensuring adequate flows of apprentices." (1999, p. 93-94)

'Weaver' as denoted in Figure 42 refers to Masterweavers, but also present in the industry are dependent weavers - identified by Clarke (1999) as those that have completed 'training' but who choose to remain and work with a masterweaver rather than set up their own business. Various seniority levels

⁵⁸ Compound is described as "a geographically defined group of patrilineally related individuals" (Clarke, 1999, p. 85) and represents one of the key ways in which the production of *aso oke* is organised.

of this cadre of weavers were identified by Clarke with length of time with masterweaver rather than age defining seniority. Dependent weavers differ from proficient trainees in that they are paid for their weaving and are able to accept orders from other masterweavers.

Trainee weavers and Apprentices make up the third category of weavers, these individuals pass through a formal apprenticeship scheme which operates on an ad hoc basis. A key point to note is that individuals from the 'compound' (or whatever term is used to quantify the organisational entity of production) are never classified as apprentices, this term is used for those from outside the 'compound' with formal contracts to learn from the masterweaver for a fixed period⁵⁹.

5.3.4 Role migration within the industry

The diagram below (Figure 44) depicts the key roles adopted by the participants of the case industry, and illustrates the movement and the direction in which role migration can occur.

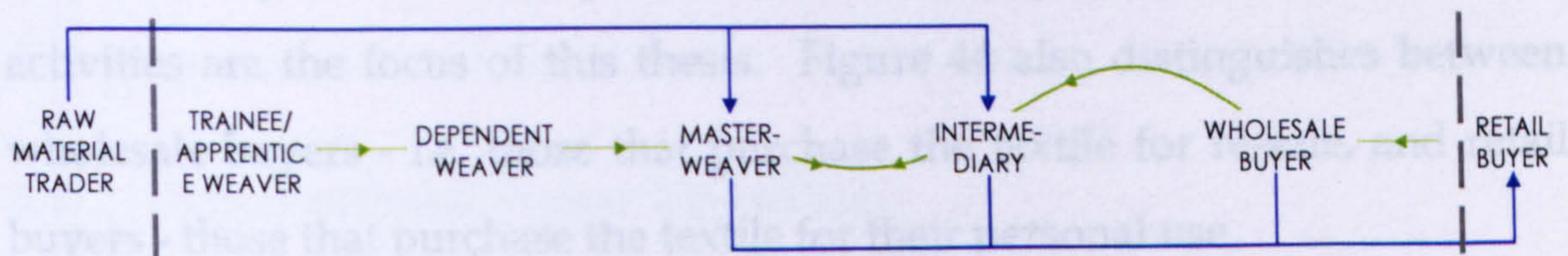


Figure 44: Roles in the *Aso Oke* Industry

The diagram can also be interpreted as the value-chain of the industry in that it illustrates the composite parties through which transactions are completed, from the generation of an order, through its manufacture (including the sourcing of raw materials), to its delivery to the customer. The diagram above implies a network organisation in which skills and competencies are

⁵⁹ This was observed in Clarke's (1999) thesis and also during the field study of the research. During interviews held with masterweavers from Kogi State on the distribution of work to fulfil large orders, weavers that originate from (or married into) the same geographic area as the masterweaver were never referred to as having been apprentices.

dispersed throughout the organisation and parties to the transaction own and control their own resources.

A typical characteristic of network organisations is that although uniformity of members, in terms of competence and aversion to risk, exists to some extent; partnerships between members are also often unequal with one member having an advantage over the other due to the possession of some specialised skill, knowledge, or resource on which others come to depend. In *Aso Oke* industry weavers have a specialised skill that intermediaries and buyers rely upon. Likewise intermediaries have knowledge on consumer tastes and behaviour that is not readily accessible to weavers. They also have knowledge about weaving capabilities and weaver characteristics that are not easily accessed by buyers.

At either end of Figure 44 are dashed vertical lines. These serve to distinguish the roles of raw material suppliers and retail buyers from the core industry activities of production, marketing and sales. These core activities are the focus of this thesis. Figure 44 also distinguishes between wholesale buyers - i.e. those that purchase the textile for re-sale, and retail buyers - those that purchase the textile for their personal use.

Role migration in the industry is identified in Figure 44 by green lines. Green single-headed (straight) arrows represent a unidirectional change in role, thus after an apprenticeship period, an apprentice/trainee weaver will graduate into a dependent weaver, who can then become a masterweaver. Likewise, a retail buyer sensing the economic potential of the industry can become a wholesale buyer. A wholesale buyer can also engage in retail transactions (i.e. transactions for personal use) however in the context of this research, this does not equate to a change in role.

Green double-headed (wavy) arrows represent bi-directional change in roles. Masterweavers can, depending on accumulated business experience and networking ability (both within the weaving community and with potential buyers), become intermediaries. During the processing of large orders, masterweavers also take on (product-) intermediary activities⁶⁰. Two broad classifications of intermediaries therefore exist - those that can also adopt weaving roles, and those that do not possess weaving skills but have access to more capital and social contacts than weavers. Some members of this latter type of intermediary can also be referred to as wholesale buyers. This is because the demarcation between intermediary and wholesale buyer is to an extent artificial. All wholesale buyers are intermediaries but not all intermediaries are wholesale buyers; this depends on the size of the intermediary's business with larger/bigger ones tending to have more stock.

Blue arrows represent the movement of raw materials into the industry and finished products out of it. The way in which these different roles combine to form structures through which trade is performed is described in the following section.

5.4 Organisational Forms Identified

The two weavers interviewed during the exploratory study were masterweavers. The female Akwete weaver had at any given time a minimum of three female weavers of varying experience working with her. When she receives large orders she travels to Akwete, in Abia state (see Figure 40) to distribute part of the order so as to meet the completion date. Large orders for this weaver comprise orders of 50 pieces of cloth or more. With such orders this weaver splits production into half. Production of one half is performed in Lagos and supervised by her. The other half is

⁶⁰ See discussion in section 5.3.2

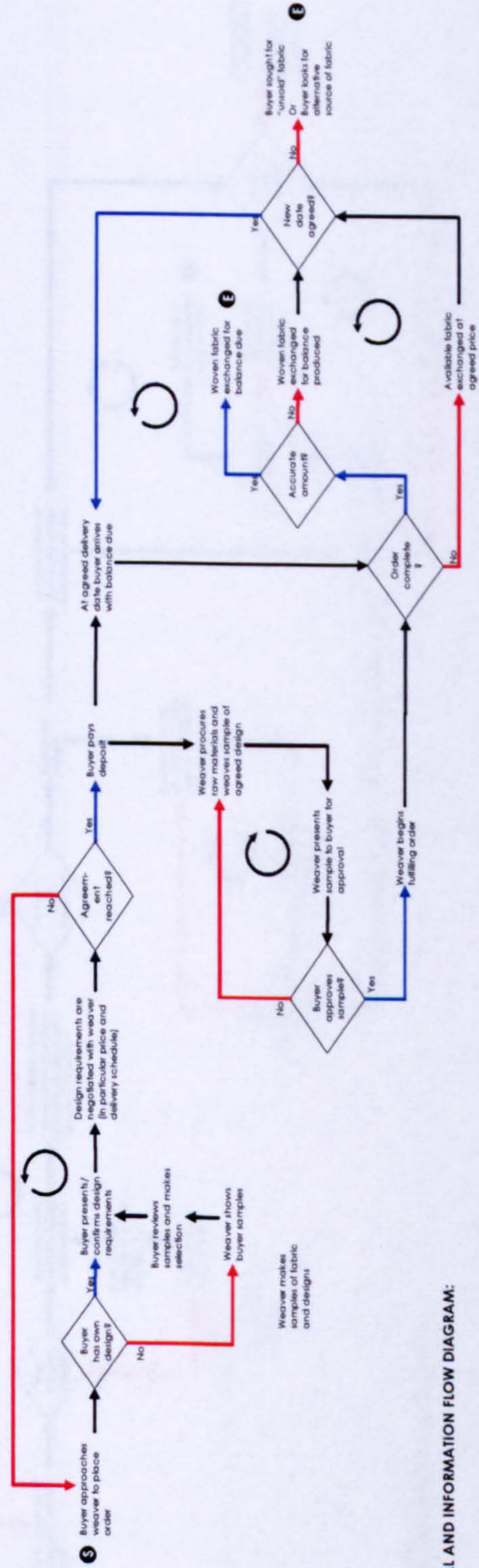
performed by weavers in Akwete and supervised by a designated coordinator.

The Akwete weaver confirmed that other indigenes of the town that had migrated to urban centres also bring orders to the town for completion. This practice she said adds to the economic viability of not only the female weavers unable to migrate but also the town in general. Furthermore, an informal migration scheme appears to have evolved, in which younger female members of the town migrate to urban centres under the guidance of prior emigrants. A period of work attachment is agreed upon during which the 'trainee' saves up money to start up on her own, builds technical and business proficiency, and if possible build up a client base.

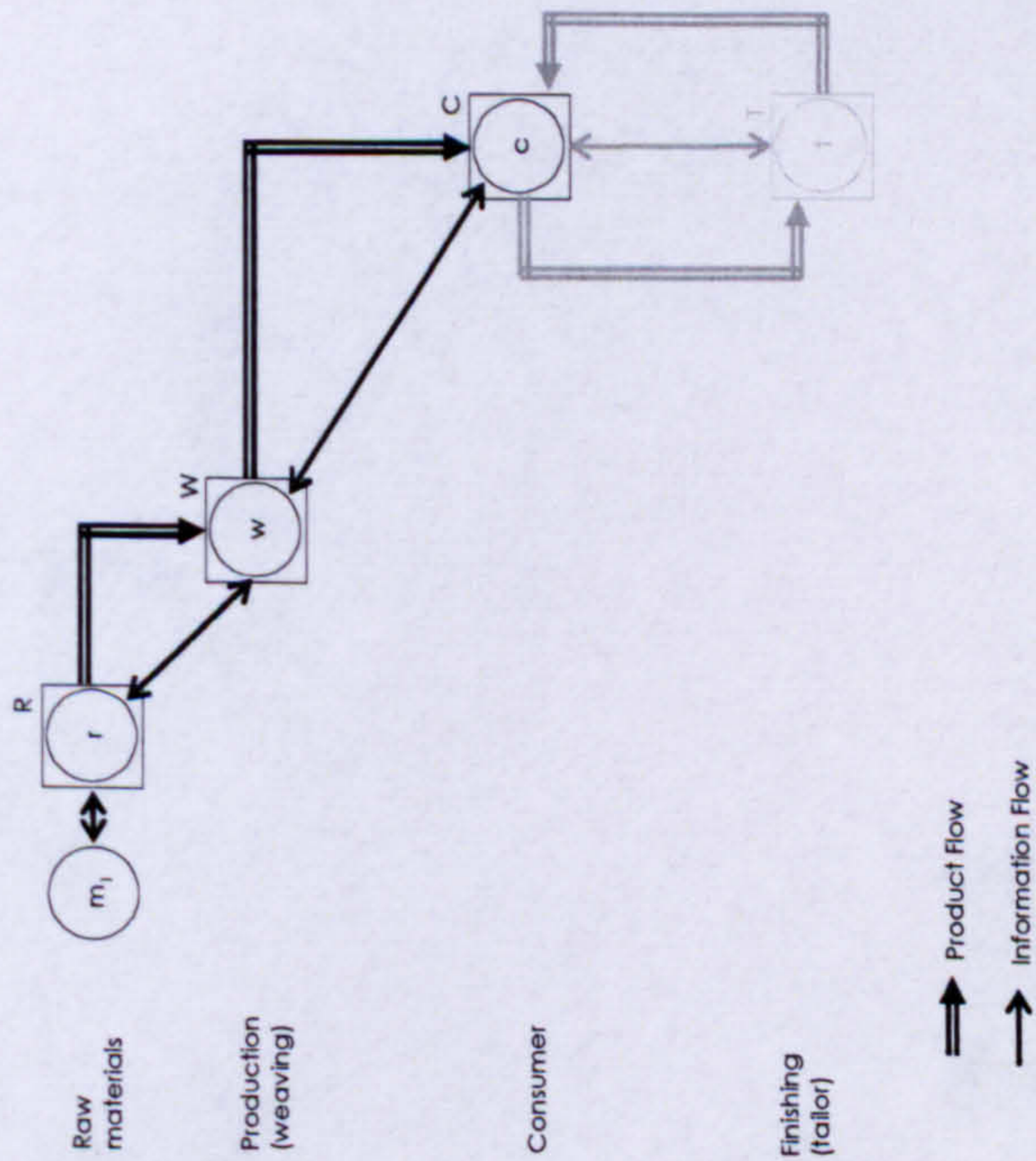
The masterweaver role was also noted amongst the male Ewe weavers, although in this case, orders are rarely taken to Ghana for completion; because of the (apparently) vast numbers of Ewe weavers currently living in Lagos, all orders can be completed within the state. Furthermore, the weaving performed in Lagos is said to be different (in design characteristics) from that of the Volta Region.

The diagrams presented in Figure 45 to Figure 47 illustrate the three organisational forms that were identified on the basis of the exploratory study, and even within and amongst these three forms, variations and hybrid forms exist. The organising structure adopted appears to depend on two main factors, origination of order and size of orders.

PROCESS FLOW DIAGRAM:



MATERIAL AND INFORMATION FLOW DIAGRAM:



Material Flow:

The flow diagram identifies three or four stages of processing: the sourcing of raw materials (R), the production of the cloth (W), and the consumption of the cloth through use (C). Often, the cloth also has to be worked upon by a tailor (T), particularly if it was woven in strips, in which case it has to be "joined" (together). In the flow diagram, "m" is used to identify mediating activities that are performed by people either within or outside the industry.

Depending on the characteristic of the design, in particular the type of thread or yarn required, the sourcing of raw materials for production might occur either within or outside the physical, geographic location of the weaver. Some of the materials required are imported whilst others (such as some locally produced thread) are manufactured within the country; Aina (1995) mentions factories in northern Nigeria. Weavers often purchase such materials in retail quantities at nearby markets. Again, depending on the location of the weaver and customer, the transfer of the finished cloth to the customer may or may not occur across geographical boundaries. Where necessary, customers will almost always use tailors that are located in the same geographic space as themselves.

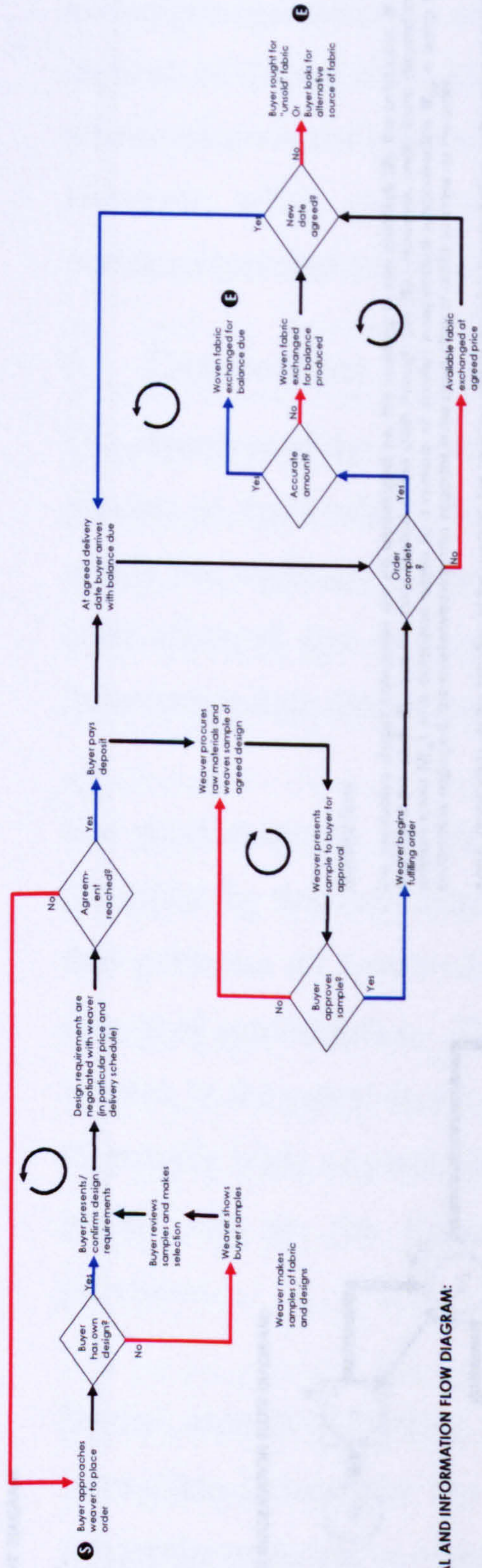
Information Flow:

The individual r (in this case the seller at the market) manages the sourcing and sale of raw materials, at times relying on individual m₁ (importer of thread or local manufacturer) for importation of some materials into his/her geographic space. Individual w is responsible for production, individual t for finishing, and individual c is the consumer. In this diagram, no intermediaries exist between the consumer and weaver, and between the consumer and tailor.

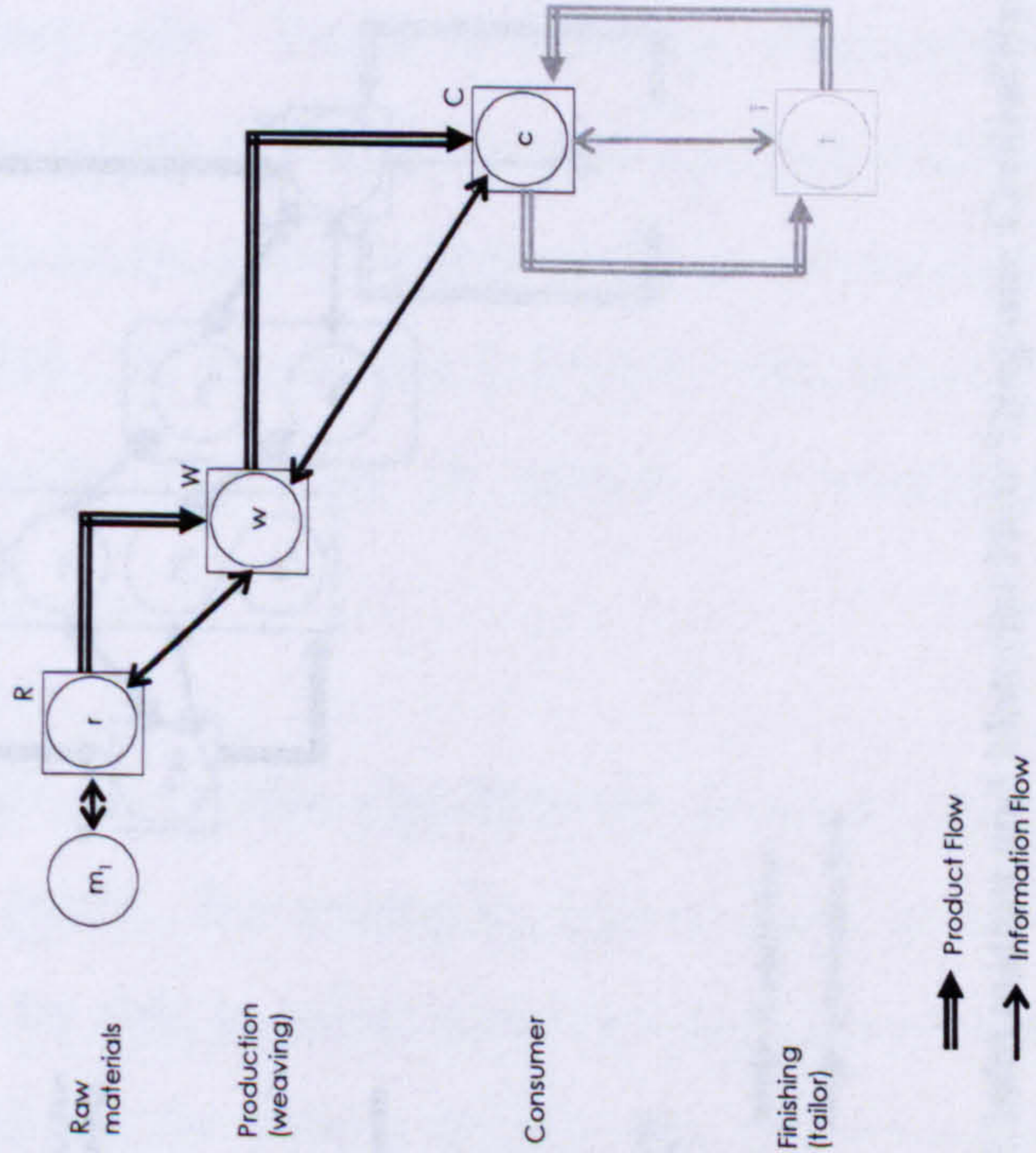
Note: Material flows are identified as block lines, units that generate or transform material flows by boxes, information flows by thin lines, and individuals that handle the flow of information by circles. A circle within a box represents an individual that handles the flow of both information and physical goods

Figure 45: Information and Material Flow Diagram: Direct Exchange

PROCESS FLOW DIAGRAM:



MATERIAL AND INFORMATION FLOW DIAGRAM:



Material Flow:

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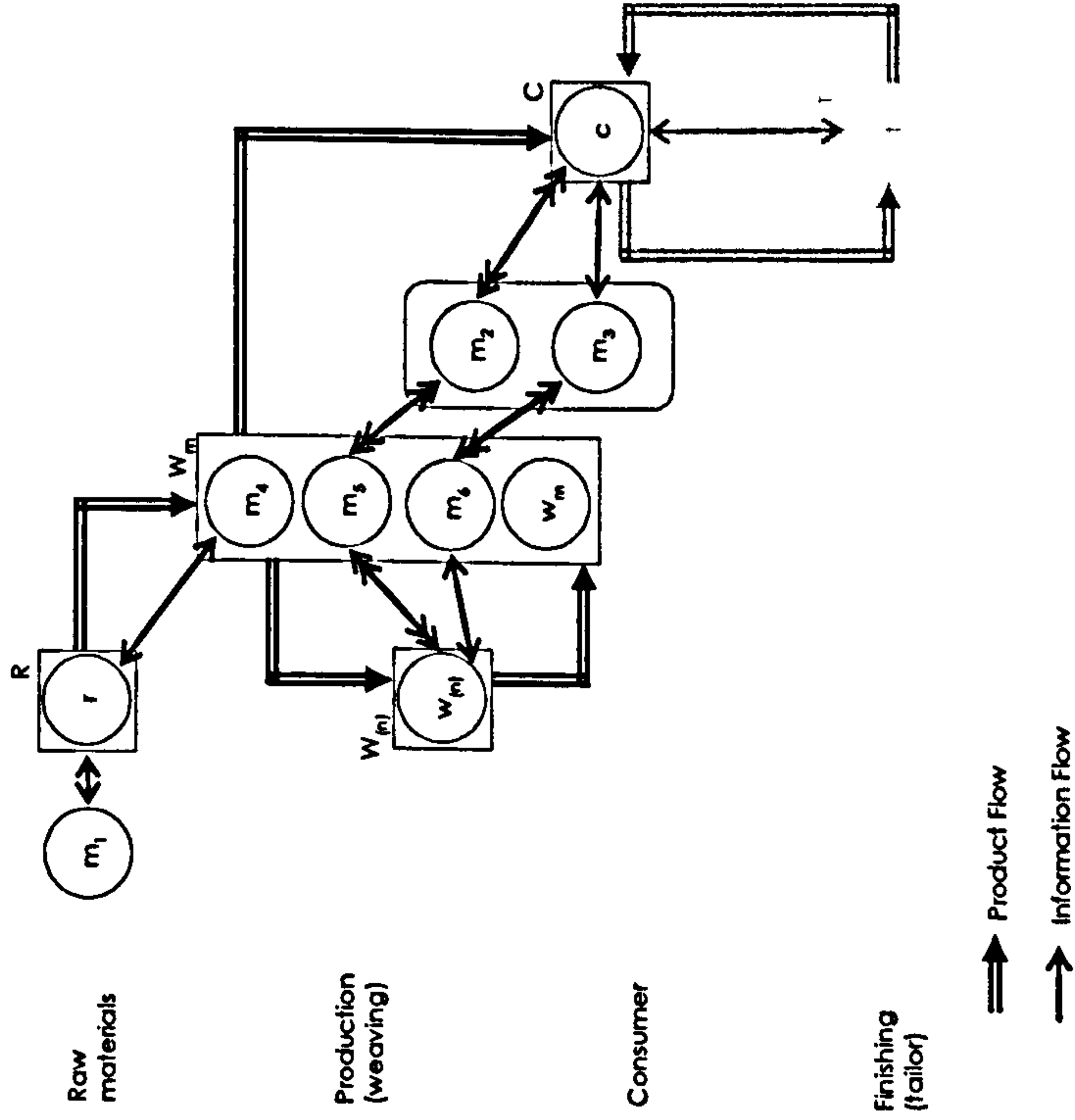
Note: Material flows are identified as block lines, units that generate or transform material flows by thin lines, and individuals that handle the flow of information by circles. A circle within a box represents an individual that handles the flow of both information and physical goods

Figure 46: Information and Material Flow Diagram: Central Exchange, Agent as Intermediary

PROCESS FLOW DIAGRAM:

As in figure 7.

MATERIAL AND INFORMATION FLOW DIAGRAM:



Material Flow:

The productive stages categories are still unchanged, i.e. the sourcing of raw materials (R), the production of the cloth (W), finishing of the cloth (T), and the consumption of the cloth through use (C). However, under these circumstances there is a masterweaver (w_m) who outsource orders to a number of (mostly) independent subcontractors $w_{(n)}$; n being the number of contractors engaged. The masterweaving also engages in the production of cloths to make up the order.

Again, depending on the location of the weaver, the sourcing of raw materials for production, outsourcing of orders, and transfer of finished products might occur within/outside the same geographic space. Under these circumstances, the weaver takes on predominantly more responsibility than the agent/trader, in fact, the agent/trader may be identified as just another representative customer.

Information Flow:

As this structure is often adopted when orders are especially large, the masterweaver has more leverage/bargaining power when procuring raw materials, m_4 therefore refers to the coordination of raw materials purchase between individual r and the masterweaver. Individual t remains responsible for 'finishing' the product, and individual c remains a representative consumer.

Again w and c do not interact directly and neither does the agent/trader with the weaving subcontractors. Whilst the agent/trader still performs the two mediating functions m_2 and m_3 , these functions are replicated by the masterweaver when dealing with his/her subcontractors (m_5 and m_6).

Differences however arise in relation to m_4 (i.e. instances in which masterweaver must sell late/returned textiles), because the masterweaver maintains ownership of the cloth throughout all stages of production, contractors tend to feel no burden with respect to these materials. It is the masterweaver that purchases and distributes the raw materials, that has committed to a design, quality level, and delivery date. Whilst subcontractors are also concerned about matters relating to quality, conformance to design, and timely delivery (so as to secure future outsourcing contracts), their monetary exposure is limited. Should an order be late, the masterweaver, having his capital tied up in the cloth is obliged to still receive the cloth from the contractor. Also, in order to maintain his/her reputation, the contractor is also often compensated (although often not at initially negotiated fees) by the masterweaver. It is for this reason that the information flow between the subcontractor and m_4 is a single-headed, rather than a double-headed arrow.

Note: Material flows are identified as block lines, units that generate or transform material flows by boxes, information flows by thin lines, and individuals that handle the flow of information by circles. A circle within a box represents an individual that handles the flow of both information and physical goods

Figure 47: Information and Material Flow Diagram: Central Exchange, Agent and Weaver as Intermediaries

When a buyer comes directly to the weaver, a direct exchange organisation is adopted (Figure 45). If the buyer orders a large quantity of textiles, a central exchange organisation is adopted with the masterweaver as the coordinator (hybrid of Figure 47). Central exchange organisations are also adopted whenever an agent (intermediary) is involved in the transaction (Figure 46). However, when orders are again large, the masterweaver in addition performs (product-) intermediary activities (Figure 47).

6 Conclusions

The objectives of the exploratory study were to gain an understanding of the process of trade within the industry, and to identify the different actors within the trade and the way in which they performed their roles. This has been achieved and is summarised in the process flow, and materials and information flow diagrams presented in this chapter.

The most common way in which trade is conducted in the industry (as identified by weavers interviewed) incorporates the function of an 'agent' that performs an intermediary role. Trade is therefore characterised by a degree of centralisation. The agent is perceived as a market-maker and the weaver, to the extent that it is more cost-effective to do so, relies on the agent to provide trade opportunities. As the textile is highly customised product, buyers rely on the diagnostic expertise of agents to coordinate their purchases.

Several aspects of trading in the textile significantly increase the costs of transaction incurred by the agent. For example, agents must build up their diagnostic expertise so as to be able to select appropriate weavers and grade their capabilities. They must also be able to balance the requirements of the buyer with the competence of weavers. Furthermore, they need to maintain

contact with a variety of individuals in the industry and coordinate their actions to ensure a successful transaction. It is therefore the agent (as intermediary) that must economise on information costs and has the most to gain from telephones. Neither of the weavers interviewed during the exploratory study made regular use of telephones as part of their trade, nor did they see any compelling reason to do so.

Both weavers cited cost of acquiring, maintaining and using the technology, as well as limited coverage of telecom networks (specifically to mobile/cellular technologies) as reasons for not using the technology. The weavers also stated that they preferred face-to-face contact as a means of communicating with intermediaries and (where applicable) buyers. This is because the majority of meetings they have with intermediaries or buyers involved either the exchange of goods or money, or the negotiation of design and/or order requirements. Neither weaver could see the efficiency of using telephones for these purposes. The use to which telephones are put within this industry was documented and analysed as part of the field study of this research. The findings of this analysis are presented in the Chapter 8.

In conclusion, this chapter began by introducing the informal sector of developing countries and the ties of this sector to economic development. The aim of this introduction was to alert the reader to the economic potential of industries located within this sector. The chapter then introduced the case industry of this research. The *Aso Oke* industry was shown to be fragmented and geographically dispersed, relying heavily on communication networks and exhibiting high levels of task specialisation. These characteristics make it a relevant industry for the study of the impact of telephony on the organisation of trade. Intermediaries also play a significant role in the industry and this was highlighted in the various flow diagrams used in depicting the types of organisational forms in the industry.

The chapter concluded by detailing the various roles adopted by participants in the industry and the three main types of organisational structures that were identified during an exploratory (pilot) study of the industry. The next chapter presents the findings of the research.

Chapter 7 Research Findings – Information

1 Introduction

The objective of this thesis is to study the impact telephones have on micro-enterprises using the Nigerian *Aso Oke* industry as a case study. In achieving this objective, this research examined the ways in which telephones were being used by participants to meet a specific need. This need is the reduction of the uncertainties that exist in the industry as a result of information imperfections. Telephones have only recently become more accessible to the participants of the *Aso Oke* industry (see section 2 of Chapter 8) and as such there were already existing techniques and mechanisms for coping with these uncertainties prior to the use of telephones. This thesis therefore analyses if and how the use of telephones changes existing techniques and/or mechanisms for coping with uncertainties.

This chapter only presents findings on the impact of information imperfections on the case industry. Using the research's suppositions as a way of structuring the findings; this chapter identifies the causes of information imperfections in the industry, their consequences and the response of the industry to ensure that trade continues in spite of these imperfections. In this way, this chapter creates an understanding of the need for information in the industry and sets the context for analysing how this need is met through the use of telephones. Findings on the ways in which telephones are used by participants in the *Aso Oke* industry and the impacts of such use are discussed in the next chapter – Chapter 8.

The suppositions for this research are presented and discussed in section 5 of Chapter 4. Those that relate to the findings presented in this chapter are reproduced below:

1. Information imperfections create varying levels of instability in the market and trade relationships. Organisational structure is a means of dealing with this instability.
2. The types of information imperfections that are present in the market determine the intermediation activities that can be observed.
3. Economic entities tend to always adopt the least cost structure [and/or mechanism] of conducting trade.

Data used in testing the above supposition were collected through semi-structured interviews, direct observations and documentation. The findings of presented in this chapter are based on this data⁶¹. This chapter is structured as follows:

Section 2 of this chapter identifies the causes of information imperfections in the case industry. The section summarises each type of imperfection and discusses the consequences they were observed to have on the way trade is performed in the industry. This section is therefore concerned with the first supposition of the research. The format used in reporting these findings is descriptive text based on the data that was collected. Often these descriptions include direct quotes from interviewees and/or observations made by the researcher.

Section 3 takes each type of information imperfection identified in the preceding section, and documents what the industry's organisational response to it has been. The outcomes of these responses – in particular how

⁶¹ The methodology adopted for data collection and analysis was discussed in Chapter 5.

the minimisation of the effect of information imperfection is manifested in the industry is also discussed. The findings presented in this section therefore relate to the second part of the supposition on information imperfections (i.e. that relating to organisational structure). The organisational responses discussed in this chapter incorporate different forms of intermediary activity and as such the findings that are presented in this section also relate to the second supposition of the research. These findings are reported using narrations/text from the field study.

Section 4 presents more detailed findings on organisational responses to information imperfections. The section highlights the organisational forms that exist in the industry as a result of information imperfections, and discusses the criteria governing membership into such organisations. This section relates to the third supposition of the research and documents the factors industry participants consider when deciding which organisational structure to adopt. The findings of this section are reported using the materials and information flow diagrams introduced earlier in this thesis (see section 5.4 of Chapter 6). These diagrams are accompanied by descriptive text based on data collected by this research and is supplemented in some parts by findings from other studies on the industry.

This chapter therefore creates an understanding of the requirement for information in the industry and in the process identifies factors that are driving the use of telephones by participants in the industry.

2 Information Imperfections in the *Aso Oke* Industry

Incomplete information is a type of information imperfection (Monk, 1989). It refers to circumstances in which either or both parties to a transaction do not have all the information they require to make a decision regarding the transaction. People have different information needs and depending on the

level of information each person finds sufficient, the decisions that are made with incomplete information are said to have been made under some level of *uncertainty*.

Uncertainty is therefore a type of incomplete information (and is by extension a reflection of the presence of imperfect information). In the *Aso Oke* industry several examples of uncertainty are evident, those identified during the case study have been summarised in Table 14 (page 232), and the following sub-sections describe their causes and consequences.

2.1 Uncertainty about New Orders

This uncertainty relates to the manner in which people that trade in *aso oke* become aware of demand for their product. Some background into the use of the textile is provided to facilitate a better understanding of this uncertainty. Traditionally or historically, *aso oke* was worn principally by royalty and occasionally by the ruling echelons of society. Amongst the wider population, its use was (and still is) associated with ceremonious occasions and life events such as ordinations, anniversaries, weddings, funerals, births etc. The prestige that comes from its association with royalty informs the manner in which the textile is used in today's contemporary times. Only royalty would appear wearing a complete outfit made from *aso oke* and similarly only the celebrant(s) at an event would be attired in similar fashion. As one of the intermediaries interviewed explained:

Aso oke is unique to the celebrant ... Due to the reverence attached to aso oke, no one, other than the celebrant[s] will wear it as a 'complete outfit' during the event.

The intermediary continues to say that:

Because they are specially ordered, no other design of aso oke worn by the celebrant will be present at the occasion.

This makes *aso oke* a highly customised product and weaving of the textile is usually performed only in response to a specific order. *Aso oke* is therefore

for the most part buyer driven and initiated, with most orders for the textile arising from buyers approaching intermediaries and weavers. This increases the industry's dependence on custom orders, leaves intermediaries and weavers open to trade and demand fluctuations, and adds to the instability of their enterprise (these outcomes were also reported by Aina, 1995).

The consequence of this dependence is that intermediaries and weavers do little in terms of formal advertising⁶² and instead rely on word-of-mouth or referrals for orders. As remarked by one of the intermediaries interviewed:

New customers tend to be referred to me by others, advertising is therefore predominantly by word-of-mouth.

This reliance is reinforced by the high risk of moral hazard and opportunistic behaviour that exists in the industry (see discussion in section 2.4). Other consequences are that demand is often concentrated in densely populated areas where large numbers of potential customers are resident. Furthermore, the referral approach adopted by buyers also leads to awareness of new orders being concentrated within a select number of players. Entry barriers into the industry are therefore high⁶³ and intermediaries and weavers that belong to this well-informed group possess high bargaining power when dealing with trade partners that do not. Such imbalances in power create opportunities for exploitation.

Another consequence of this uncertainty is that participants (especially weavers) are reluctant to turn down any orders that they do get, even when they do not have the capacity and/or capabilities to fulfil them. As one of

⁶² Where advertising was encountered in the case study it was performed by intermediaries and took the form of business cards, stickers, and on plastic bags used in packaging the textile. Some intermediaries would also attend the event for which they have supplied the *aso oke* and would be approached by guests that are interest in the textile.

⁶³ This is in addition to the weaving skills that players must possess to become weavers in the industry.

the intermediaries interviewed stated “weavers never say no” and their acceptance of orders when they do not have the time and/or skills to complete them results in customer dissatisfaction and an erosion of reputational capital.

Another response to this uncertainty is that participants often adopt a short-term approach to business and try to get the most financial benefit out of each order; even if this means taking short-cuts that impact negatively on the order. Some short-cuts mentioned during the interviewees include overcharging or under-paying for an order, using poor quality threads (raw materials) in weaving the textile, making the textile of shorter length and/or width than is standard, not allocating enough time to completing the order within the agreed time-frame and thus missing the delivery deadline. At the most extreme, some industry participants will abscond completely without delivering on their part of the contract – this includes weavers failing to deliver ordered textiles and intermediaries or buyers failing to complete payment of orders placed.

2.2 Lack of Knowledge about *Aso Oke* and the Transaction Process

As mentioned in the preceding section *aso oke* is not for everyday use but is instead worn on special ceremonies and celebration of life events. Placing an order for *aso oke* therefore occurs rarely and requires that the buyer spend time and effort in finding the best option for the price that matches their requirement. However, buyers often do not have the time and resources to do this and are therefore unsure of what is possible in terms of design, and the stages required in completing the transaction.

This lack of knowledge also extends to suppliers⁶⁴ of the textile. Not only is *aso oke* an occasional purchase, it is also customised to the buyer's tastes and this makes the requirements of buyers difficult to predict and their expectations hard to manage. For example, during the field study, the researcher observed that some potential buyers did not even know that the textile is hand-woven. Also, interviews with intermediaries revealed that the most common problem associated with the limited knowledge buyers have of the industry is the time-frame they give to complete orders. It was noted by intermediaries that buyers' underestimation of the time required to produce the textile meant that they did not place their orders early enough. This significantly increases the coordination effort required to complete the order; as a result both the buyer and supplier experience more stress during the transaction and the reputation of the textile and of the industry as a whole reduces. As noted by one intermediary:

...disappointments happen for various reasons. For one, it can be linked to the timing of the customer; some do not start the process early enough and there is a lot of rushing towards the time of the event

At its worst, this uncertainty can lead to failure of trade as buyers look to alternative textiles for use at their events. In comparing *aso oke* with one such alternative (a fabric known as damask) one of the buyers interviewed:

...identified the ease with which selection, ordering and collection processes are undertaken, as the main advantage damask has over *aso oke* for use as *aso ebi*⁶⁵. According to her, the use of damask is less stressful: if the buyer has the money at the time of purchase, the fabric [damask] is collected there and then. Unlike the case of *aso oke*, where money in the form of deposits has to be given, there is then a

⁶⁴ The term supplier is used here to refer to both intermediaries and weavers as a buyer might approach either for the fabrication of an order.

⁶⁵ The concept of *aso ebi* is explained in section 5.3.1 of Chapter 6. It involves "...groups of celebrants at any event expressing their sense of group or family unity by dressing in the same pattern of fabric." (Clarke, 1997, p. 102)

wait for the product that is accompanied by the anxiety of disappointment.

Another problem resulting from the lack of knowledge about the product and industry is that participants are not always sure who it is safe to do business with. This decision can only be improved upon through the sharing of private information - i.e. information known only by either party of a transaction. Private information held by suppliers includes technical knowledge of how design ideas and concepts can be translated into the finished product and who (i.e. type of weaver) possesses the skill to fabricate such patterns. Private information also includes the price charged for specific designs/patterns of fabric and information on changing fashion and trends. With respect to buyers, private information includes how much they are willing to pay for their desired fabric, and (related to price) their ability to pay for their order.

If at the time a contract is signed or a transaction takes place, the person with more undisclosed private information is able to negotiate an exchange that is more in their favour, adverse selection is said to have occurred. Adverse selection can constrain the quality of *aso oke* that is traded as people (to the extent they are able to get away with it) tend to reveal the barest minimum information needed to get maximum returns (Akerlof, 1984). Some examples of how quality can be compromised have already been highlighted in section 2.1 (see discussion on short-cuts).

2.3 Uncertainty about Availability of Raw Materials

This uncertainty relates to the unstable supply of thread in the market. Thread is an integral part of the fabrication of *aso oke*. This unstable supply of thread occurs because demand for thread is difficult to predict and this may be attributed to three main factors: first, the *Aso Oke* industry is just one

of a number of market segments for thread dealers. The demand arising from this industry therefore has to be put in perspective of a larger market for thread.

Second a significant proportion of the thread available in the market is imported into the country. One of the intermediaries interviewed estimated that 90% of the synthetic threads used by her business were imports from the Far East. The reliance on imported textiles constitutes a constraint on the industry as the time lag between placing orders and accepting delivery means that:

...there will be problems in supply.

Third (and finally), there is limited interaction between participants within the industry and also between the industry and suppliers of thread. There is therefore limited opportunity to share information of consumer tastes and how to manage them. A key reason for this is that the industry is predominantly buyer driven (as previously discussed in section 2.1), and therefore the opportunity for other industry participants to interact does not arise until after the buyer already has an idea of the design preferences he wants. Both producers and importers of thread therefore tend to lag behind consumer preferences. Also contributing to this is the manner in which designs are selected by buyers in the first place. As stated by one of the buyers interviewed:

There is no innovation and creativity in the industry prompting the designs selected by buyers ... people reproduce the designs of others rather than coming out with their own innovations. Trends are therefore followed intensely but can also change suddenly.

Thus if a particular colour suddenly comes into vogue there will be limited supply of that colour thread in the market. Thread traders are however wary of carrying big inventories of a particular colour of thread as a new colour can come into vogue leaving them with outdated stock. This market

imbalance (in supply and demand) is taken advantage of by thread traders who charge higher prices for the most sought after colour/shades. The scarcity of raw materials is therefore to their advantage.

The following description of the way in which orders are fulfilled in the industry is provided to facilitate a better understanding of the consequences of the uncertainty being discussed (i.e. the supply of raw materials). When *aso oke* is ordered in bulk for use as *aso ebi*, it is produced in batches, with the number of batches dependent on the size of the order. A deposit is paid by the buyer at the start of the first batch, which is meant to be used to purchase the raw materials required for the entire order, and where negotiated pay for part of the labour required in weaving the order. The buyer makes the balance payment upon collection of the final batch. This final payment is usually the weaver's labour wage and profit.

Things however do not always work out in this manner. First of all, the order placed by the buyer may change and on most occasions the order number is usually increased and in fact all the intermediaries and weavers interviewed have come to expect this. In such circumstances there is no guarantee that the same colour of thread will be available in the market when the time comes to produce the extra units. Second, weavers often have people working with/for them that have to be paid for the orders they produce. According to one weaver the usual practice is to pay these workers in instalments:

...half at the start of the weaving and the balance when the order has been completed. However, the weaver may come for money in between, he might be in need of funds for emergency purposes and I cannot say no to such requests.

The subsistence existence of these weavers is articulated by another weaver:

It is my responsibility to provide work for them as this is their only source of earnings; it is what "they use to eat".

Thus a deposit that was meant solely for the purchase of raw materials could be used for other legitimate purposes related to the order. As weavers do not have high levels of financial liquidity to purchase all the raw materials needed and cater for other liabilities, they must periodically (as they receive more money) return to the market during the course of fulfilling the entire order to purchase more materials. However (as stated above), the specific colour of thread for the order may no longer be available in the market.

The main consequence of this uncertainty is therefore the instability it generates in the process of fulfilling orders. When an order requires either a particularly unique or popular colour of thread more effort is expended on searching for raw materials and this can result in an elongation of the order fulfilment process. The uncertainty also increases the potential risk of dissatisfaction buyers and/or intermediaries are exposed to. This dissatisfaction can be great when a particular colour of thread runs out midway through an order and the weaver uses a similar shade for the rest of the order without first confirming with the client. At the extreme, the weaver may have used the deposit for other purposes and not have money to buy the raw materials required to complete the order. The order is not completed and the weaver often absconds. This scenario represents a complete breakdown in the transaction.

2.4 Uncertainty about Behaviour of Trade Partner

There are three key characteristics of an order for *aso oke* that the buyer and supplier must agree upon at the start of a transaction. These are: the texture or consistency of the fabric that needs to be achieved, the design of the fabric including colour combination, and the size of the order i.e. the quantity of fabric that is required. In addition to this the price must also be agreed upon, as well as delivery dates for completed batches of the order. Any of these 'agreements' can be changed by one person to the detriment of the other

party(ies) to the transaction. Knowing that such changes in behaviour can occur creates uncertainty in the industry.

This uncertainty is fuelled by a combination of past experiences of current participants in the industry and of people that have come in contact with the industry at a point in time. Key consequences of this uncertainty are that a lack of trust prevails in the industry. Trading parties are very suspicious of each other and tend to look out only for themselves during each transaction. The industry also suffers from negative word-of-mouth in the form of stories about bad experiences participants in the industry have had. This can lead to market failure whereby potential buyers are not willing to take the risk of engaging in trade with anyone in the industry and instead use alternative fabric(s) for their events.

2.4.1 Uncertainty about the behaviour of weavers

An illustration of weavers using money paid as deposit for an order for other related business activities was provided in section 2.3. The behaviour of weavers is however not always business orientated and both customers and intermediaries interviewed reported having suffered bad experiences with weavers. The general perception is that weavers cannot be trusted with 'large sums of money':

[An intermediary] illustrated this by describing an example in which money for the purpose of purchasing thread was used to pay for other unrelated events [in this case a child's naming ceremony] and repayment of accrued debts. Such practices impact directly on the commissioned order.

The impact this has on the order is that insufficient thread is procured at the start of the order. The weaver must therefore return to the market at a later date (when more money becomes available and often after work on the order has started) to buy more thread. As explained in section 2.3, there is limited (if any) guarantee that the required colour of thread will still be available in the market, and as the weaver cannot admit to using part of the deposit for

other purposes, thread of a similar colour is usually procured and used to fabricate the rest of the order. This of course results in colour inconsistencies and thus disappointment for the intermediary/customer. Furthermore, the prior narrative assumes that the weaver is able to secure additional funds to use for the procurement of more thread. When this is the case, such funds are more often than not deposits for new (and unrelated) orders. Weavers can therefore find themselves trapped in a vicious cycle of continuous debt in which deposits from one order are used to complete prior (unrelated) orders, there are delays in fulfilling orders, effort is expended on the search for more deposits, quality becomes increasingly compromised, and in the absence of additional funds, the weaver absconds without completing the order resulting in buyers being disappointed, and reputations being negatively impacted or ruined.

2.4.2 Uncertainty about the surety of the customer

Another type of uncertainty relating to the behaviour of trade partners is that of the ability of customers to pay for their orders. All of the intermediaries and weavers interviewed recounted at least one example of their experiences of this.

Inability of customer's to pay for their order can be especially problematic when intermediaries/weavers have used their own resources to complete the order. In such circumstances the financial exposure can be considerable as the intermediary or weaver is then saddled with highly customised stock that is difficult to sell (and which usually has to be sold at a discount). Furthermore, the turnaround time for converting investment in inventory (used to fulfil the order) into cash in hand (via sale of stock) impacts on the intermediary/weaver's liquidity and thus ability to make new investments by accepting orders from potentially profitable customers.

2.4.3 Uncertainty arising from changes in trade agreement

Buyers can also change trade agreements. These include changes to the colour of the textile, delivery date, and most commonly the size of the order. The following background information is provided to facilitate understanding of the origin of this type of uncertainty.

As mentioned elsewhere in this thesis (for example see section 5.3.1 of Chapter 6), there are two types of *aso oke* orders. The first is the individual and highly customised fabric worn by the celebrant(s) of the occasion. The second is *aso ebi* – fabric worn by groups of people at an event.

Individual orders are relatively straight forward and can be likened to placing an order for any other custom-made outfit. The case is however different for *aso ebi*. In such cases one person is (or a few people are) in charge of coordinating the entire ordering and distribution processes. This includes placing the order, collecting monies from those interested in buying the textile, paying the intermediary or weaver, collecting or receiving the finished textile from the intermediary or weaver, and ensuring that all the end-users get their fabric prior to the event.

Uncertainties arising from changes to agreed trade terms frequently occur with *aso ebi*. The normal scenario is for completed fabrics to be collected by the designated buyer(s) and then distributed to end-users that have stated a prior interest in procuring it for the event. Money to cover the cost of the fabric is collected from the end-users and this goes towards reimbursing the deposit paid for the order⁶⁶ and also towards paying the balance due to the supplier. Complications can however arise:

⁶⁶ This deposit is usually paid for by the designated buyer. As exemplified in the following comment: [*Buyer speaking*] a substantial deposit was made [approximately 70%] of the final

... [the buyer] places orders for fabric based on interests [of family and friends] and puts down a deposit, some people pay in advance for their fabric but most pay when they collect it. It is therefore possible for people that promised to buy to opt out at no cost to them; however [the buyer] would be left with excess fabric.

When this occurs the buyer(s) either persuades the intermediary/weaver to take on the excess fabric and sell it to retail buyers, or failing this takes up the excess and pays the balance owed to the supplier out of his/her own pocket. Those buyers who cannot afford to do this have been known to abscond without settling their bill. This perpetrates a culture of bad debts in the industry and which further reduces the confidence people have in the industry.

2.5 Summary of Information Imperfections

This section presented the research's findings on the occurrences, causes, and consequences of information imperfections in the *Aso Oke* industry. Imperfections were defined as *uncertainties* and four main types were discussed. These include uncertainties about - new orders, the supply of raw materials, behaviour of trade partners, and lack of knowledge about the product and process of trade.

The uncertainties, summarised in Table 14, help to assess the first supposition of this thesis, which is that:

Information imperfections create varying levels of instability in the market and trade relationships.

The findings of this research have shown this part of the supposition to be true in the *Aso Oke* industry. A review of the consequences of the uncertainties discussed in this section (see Table 14) show that various types of instability are present in the industry. These manifest in a variety of ways including a high susceptibility to trade and demand fluctuations, short-term

bill and because money was not collected from family and friends until delivery of the fabric, this deposit was [the buyer's] own money.

orientation of trading parties that encourages opportunistic behaviour, high levels of distrust and suspicion in the industry, and on occasion market failure whereby rather than purchase *aso oke*, buyers instead elect to use alternative fabrics for their events.

Findings from the field study also identified bad debts as a key manifestation of the climate of uncertainty and instability in the *Aso Oke* industry. As illustrated by Figure 48, bad debts reinforce the distrust experienced in the industry.

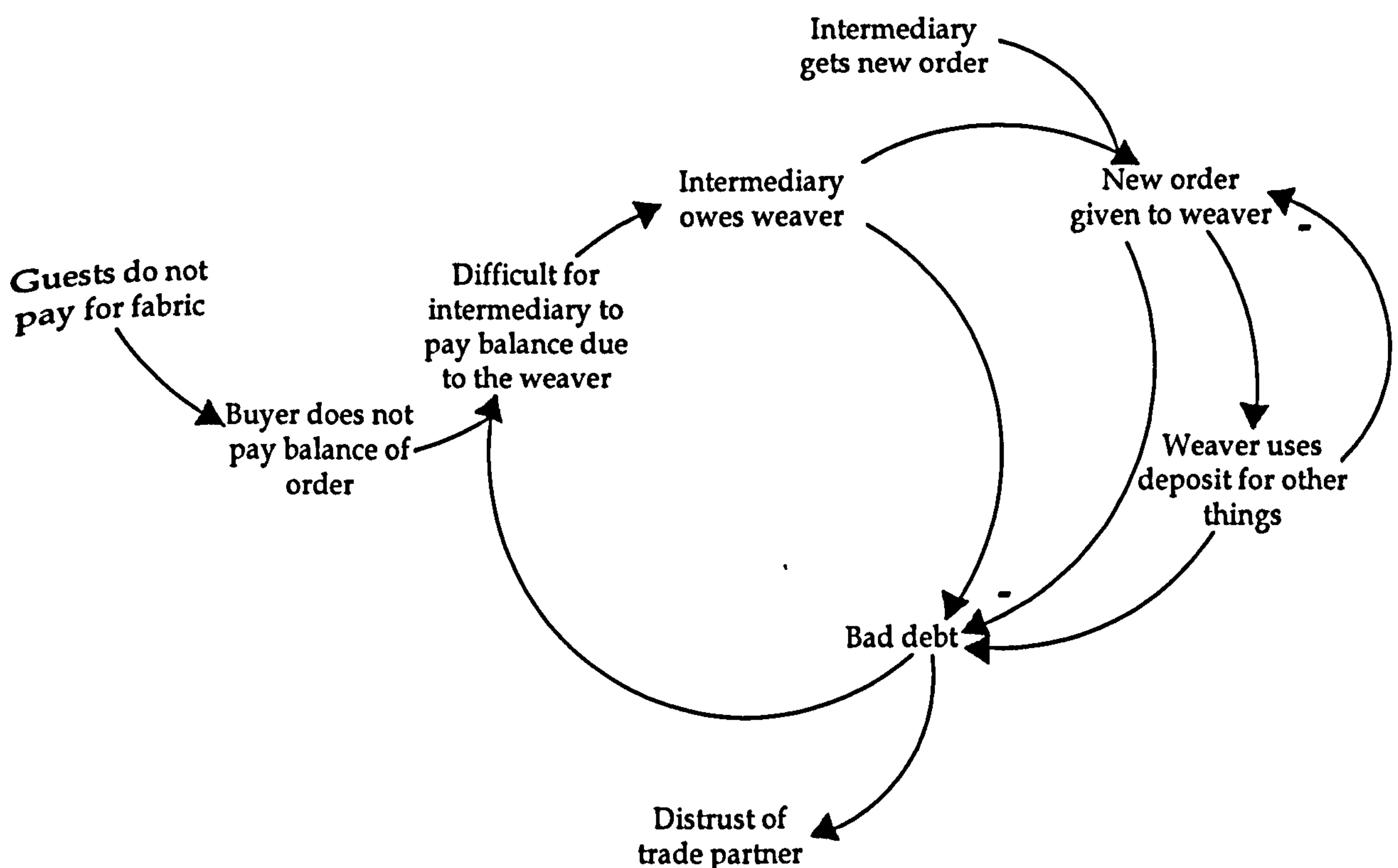


Figure 48: Bad debt reinforces the cycle of distrust in the industry

Participants in the industry have however developed a number of responses that enable trade to continue under these conditions of uncertainty and instability. These are discussed in the following section.

Table 14: Summary of uncertainties in the *Aso Oke* industry, what causes them and their consequences

	UNCERTAINTY	CAUSES	CONSEQUENCES
1	Uncertainty about new orders	Nature or characteristics of <i>aso oke</i> and the way in which it is used	<p>Buyer driven and initiated industry</p> <p>Little formal advertising performed by intermediaries and buyers</p> <p>High susceptibility to trade and demand fluctuations</p> <p>Concentration of demand in densely populated areas</p> <p>As buyer's employ referral approach in selecting trade partners, importance of reputational capital increases</p> <p>High barriers to entry</p> <p>High bargaining powers for participants with high reputational capital</p> <p>Reluctance to turn away orders even when there are no or limited resources to fulfil the order</p> <p>Short-term orientation to transactions. Participants seek to get the most out of each transaction irrespective of consequences</p>
2	Lack of knowledge about the product and transaction process	<p>Nature or characteristics of <i>aso oke</i> and the way in which it is used</p> <p>Withholding of private information</p>	<p>Difficulty in predicting requirements of buyers</p> <p>Difficulty in managing expectations of buyers</p>

	UNCERTAINTY	CAUSES	CONSEQUENCES
			<p>Increase in effort/stress associated with completing orders.</p> <p>Market failure as buyers use alternative fabric(s) for their events</p> <p>Adverse selection arising from buyer's inability to assess the quality of the textile</p>
3	<p>Uncertainty about the availability of raw materials</p>	<p>Significant amount of thread used in the industry are imports</p> <p>Buyer driven nature of the industry and limited interaction between participants makes demand and consumer tastes difficult to predict</p> <p>Lack of innovation and copying of design patterns in the industry</p>	<p>Increase in effort/stress associated with completing orders that can result in an elongation of the order fulfilment process</p> <p>Increases risk of customer dissatisfaction</p>
4	<p>Uncertainty about the behaviour of trade partner - that one party to the trade will change their behaviour to the detriment of the other party once a transaction has been agreed upon</p>	<p>Past experiences of industry participants</p> <p>Experiences of previous buyers</p>	<p>Negative word-of-mouth via stories about experiences of other participants in the industry</p> <p>Lack of trust between participants in the industry. High level of suspicion</p> <p>Trading parties look out only for themselves</p> <p>Market failure as buyers use alternative fabric(s) for their events</p>

3 Intermediation in the *Aso Oke* Industry

Information imperfections are reduced through the acquisition of information. The process of obtaining information occurs at a cost; however this cost can be reduced through the process of intermediation. This is because intermediation supports the pooling of information, making it more efficient and cheaper for information about transactions and trade partners to be obtained or exchanged. Where there is no pooling of information, each participant has to individually invest his/her resources (time, money etc.) in obtaining information about each transaction and trade partner. Different forms of information imperfections require different types of intermediary intervention.

This section takes each of the uncertainties identified in section 2Error! Reference source not found. in turn and discusses how the industry has responded to them and what the outcomes of these responses have been. The findings presented in this section are summarised in Table 15.

3.1 Response to Uncertainty about New Orders

As explained in section 2.1, this uncertainty relates to the manner in which people that trade in *aso oke* become aware of demand for their product. The *Aso Oke* industry is buyer driven and buyers rely on referrals in identifying potential trade partners. The key response by intermediaries and weavers to this uncertainty has therefore been the building of presence and visibility in the industry. The primary way in which this is achieved is by building a good reputation (or reputational capital). During the field study intermediaries and weavers were asked what the key to their success was, all mentioned 'reputation' in one form or another. Being known to be reliable, to produce good quality cloth, to be able to handle large order quantities, and come up with innovative designs were quoted by the interviewees

(irrespective of their role in the industry) as contributing towards a good reputation. One of the buyers interviewed summarised her selection criteria for choosing an intermediary to place an order with as follows:

I wanted someone that was established, someone that would be able to do the numbers, deliver on time and deliver consistent quality products.

Reputational capital that is built up through good trade performance acts as an incentive against taking a short-term and opportunistic perspective. That a good reputation is vital to the success an individual within this industry is an observation that has been picked up by other researchers:

'... it is vital that the customer can trust the weaver, and that he is able to establish a reputation for delivering cloth of the appropriate quality at the time agreed. Aso oke is a crucial element in ceremonies such as weddings, and may be ordered up to six months in advance to ensure that there is plenty of time to resolve any disputes that may arise. Few customers have sufficient money to place another order elsewhere or buy cloth at the market if the first weaver over commits himself or otherwise lets them down. Customers repeatedly stress, using the English word "disappoint" that the weaver must not fail to fulfil his agreement ... It is to a large degree by establishing a reputation for reliability that the masterweavers ... have been able to sustain a substantial turnover of business without having much capital. (Clarke, 1999:121)

The challenge of getting the opportunity to prove this reputation is however another matter and is dealt with in the following section on "selection criteria" (section 3.3).

The reliance by buyers on referrals was noted in section 2.1 as contributing to a concentration of demand in densely populated areas. This should not be taken to mean that there is no demand in other geographic areas but rather that the frequency of transaction (and thus probability of getting an order) is greater in areas with high populations like towns and cities. Weavers have responded to this, by migrating (from regions within Nigeria) and

emigrating (from neighbouring countries – in particular Ghana) to urban centres in Nigeria in search of orders. One weaver interviewed

...was weaving in Kogi State before coming to Lagos State and returns on occasion to bring weavers to Lagos to weave in her shop. When she was still in Kogi, orders that were brought for fabrication from a variety of urban areas in Nigeria and not just Lagos; local buyers also placed orders. These orders were however not substantial and prompted the move to a more steady source of demand.

Weavers therefore see relocation to urban centres as a way of increasing their chances of getting orders. This is because they are closer to a larger pool of demand.

Another consequence of the uncertainty about new orders relates to opportunistic behaviour. This refers to the possibility that because suppliers do not know when their next order will be, they will be reluctant to turn any order they get down, even when they are unable to fulfil it. There is also the possibility that suppliers will adopt a short-term perspective to every order they seek to get the most financial gain from the order even at the expense of the person they are trading with. Responses to these two consequences are dealt with in section 3.5 where the implementation of mechanisms for monitoring and control are discussed.

3.2 Implications of a Referral Industry on Selection Criteria

In a referral industry reputation acts as a proxy for trustworthiness (Swift, 2001). As mentioned in section 2.1 little if any form of formal advertising is performed by suppliers in this industry and for the most part, introductions to trade partners are predominantly through referrals. Word-of-mouth is thus a powerful tool in establishing and destroying reputations and what is said is often based on past trade performances and product characteristics. Whilst positive word-of-mouth is usually accepted when obtained from someone that has had an actual experience with the person they are

recommending. The same cannot be said of negative word-of-mouth which can be accepted even from people who have had no business contact with the person being spoken about. One of the intermediaries interviewed remarked that the raised voices of disappointed customers on one occasion drew the attention of her neighbours, who generally do not know “what goes on in my compound”. Rumours and speculation can therefore be spread as a result of one very vocal incident and as such the negative word-of-mouth can have a very powerful impact on reputation indeed.

Given that little formal advertising occurs in the industry, the following subsections examine the different methods adopted in selecting a trade partner. This is done to illustrate the mechanisms adopted in overcoming uncertainty regarding orders and shows that the more effective selection methods require significantly high levels of communication and interaction.

3.2.1 ‘Cold Calling’

Due to the high level of distrust in the industry (discussed in section 2.4), by far the least successful method that can be employed in sourcing for orders is ‘cold calling’ – i.e. approaching a potential customer when the customer has not requested contact. An intermediary noted that although weavers who have not fabricated orders for her sometimes approach her for work:

...over a period of time and experiences [for example unfulfilled orders and theft], she deals only with masterweavers. Any new weavers that she does use are employed only after being introduced by a masterweaver who must act as a referee and guarantor.

3.2.2 Recommendation by suppliers

Unlike the other types of weavers identified in the industry (see Chapter 6, section 5.3.2) masterweavers run a business and are therefore perceived as having more at stake in a transaction than dependent and trainee weavers. Masterweavers have established premises and as such are easy to trace (unlike other weavers that are much more mobile). Being accountable is

therefore important in the industry and it is on the basis of this accountability that recommendations, especially those made by suppliers, are considered.

Even when a weaver has been introduced by a reputable source (such as another masterweaver or intermediary) there is still a process of trust building (via the placement and completion of trial orders) before confidence in the weaver is established. One such process was described by one of the weavers interviewed:

[When] the new buyer is meeting the weaver there is no trust and so a trial order is placed. The weaver must use his own money to complete the order. Once the order is completed, a price is negotiated; as such payment is made for work that has already been done. The weaver is then given a sample by the buyer to replicate. Again, the weaver must use his own money to complete the order [this is usually the payment received for the first trial order]. This continues for a time and eventually an advance for an order is given to the weaver.

It therefore appears that the giving of a deposit indicates the establishment of a level of trust. It is at this point that the intermediary will entrust client orders to the weaver. The performance of the weaver during the trail process leads to repeat purchases and such repeat purchases result in the development of a relationship with the trade partner. Trust is built up between both parties provided that there has been no 'disappointment'⁶⁷ and the fabric produced has been of good quality. According to the weaver, the relationship is cemented when the intermediary pays a visit to the weaver's workshop:

[During the trail process] the buyer will find out the location of the weaver's workshop either by sending a shop assistant or driver to trace the address given by the weaver. For [the weaver], the conclusion of the process is when the buyer visits the weaver in his workshop in person. The weaver can then consider himself to be one of the buyer's weavers.

⁶⁷ This refers to a dissonance phenomenon in the industry that was identified by all interview participants by the term 'disappoint'.

However, for the weaver to even begin to build a trust-based relationship with an intermediary they need to have been first recommended. It can therefore be said (about the *Aso Oke* industry) that whilst reputation gets you an audience, trust is needed to get orders. Once a trusting relationship is in place, it can be leveraged to extend business networks:

A good relationship has been established between [the intermediary and weaver] ...and [the weaver] has introduced other weavers that use a different type of loom to [the buyer] and she in turn has introduced him to other buyers.

3.2.3 Recommendation by buyers

Unlike intermediaries, buyers do not have the luxury of a trial process. In deciding on a supplier, buyers will most likely use the recommendation of someone they already trust - a family member or friend who has either ordered the fabric in the (not too distant) past, or has knowledge of/operates in the industry. Buyers thereby acquire historical personal information (that is based on the experiences of their contact) and use this in selecting and negotiating with suppliers. In addition to private information from family and friends, buyers will also be attracted by examples of a supplier's work. One of the buyers interviewed spoke of seeing an intermediary's fabric being worn at an event and had asked the person wearing it for the intermediary's details.

Therefore, in the *Aso Oke* industry, the fabric itself is advertisement and it is often the only form of advertising that is undertaken. As mentioned by one of the intermediaries interviewed, "*aso oke* is an indoor business" and participants rely on the reputation they have with their family, friends and/or other members in the trade as a way of assessing who to do and not do business with. The ability to recommend and to be recommended is therefore of great worth.

3.3 Response to Adverse Selection [Lack of Knowledge about the Product and Process of Trade]

The consequences of this uncertainty to suppliers were identified as the difficulties experienced in (i) predicting the requirements of buyers and in (ii) managing expectations (see section 2.2). An increase in the effort required by suppliers in completing orders was also identified - especially when the buyer is late in placing the order. The main consequences for the buyer are that the quality of the product that they buy as well as the quality of their transaction experience will be sub-standard. This can have a negative impact on the industry as a whole by resulting in market failure with buyers preferring to use other fabrics instead of *aso oke*. The following are the responses of the industry to this uncertainty.

3.3.1 Building awareness

The different types of private information⁶⁸ held by different groups in the industry were highlighted in section 2.2, these include the technical information held by suppliers and the price threshold of buyers. In the *Aso Oke* industry, building awareness of technical information aids in the development of competence in the industry. When combined with proof of what can be achieved in the form of samples of prior orders, this information helps to encourage trade by creating confidence in (potential) trade partners.

It is therefore common to find weavers and intermediaries keeping an updated repository of either physical samples or pictures of *aso oke* that they have produced or supervised the production of. These samples are usually shown to buyers during the prospecting phase of an order. Advising prospective buyers about their order and convincing them of a supplier's competence to complete a design according to specification also involves the

⁶⁸ This is information that is known only by one party to a transaction

production of a sample of the buyer's requirements. Buyer's can then use the sample to determine whether or not the design and colour combination they are proposing works for them.

3.3.2 Providing product guarantees

Convincing buyers that their design specifications can be met is one thing, guaranteeing it is another. It is therefore important that buyers are given the opportunity to assess product quality not only at the start of the order (via the sample produced) but throughout the entire order fulfilment process. Here the risk of adverse selection is minimised by the supplier providing guarantees of quality and implementing a mechanism for addressing incidences of poor quality. Intermediaries are known to do just this:

[The buyer] said that with dealers⁶⁹ you could reject orders that are not satisfactory and collect your money back from them. Whilst she identified that some people may want to go directly to weavers so as to cut down on cost, she insisted that she would not as they are known to "disappoint" producing fabric of poor quality and at times no product at all.

As a result (of being able to provide quality guarantees), buyers prefer trading with intermediaries than directly with weavers (even though intermediaries are more expensive).

3.3.3 Providing transaction guarantees

Guaranteeing transaction commitments, especially agreed delivery dates is also an important strategy intermediaries employ in minimising the effects of this type of uncertainty (i.e. adverse selection). Once a customer decides on the characteristics of an order the most important aspect of the transaction negotiated with the supplier relates to the delivery time (or schedule) of the completed fabric. One of the common causes of the phenomenon known as 'disappoint' is when an order has not been completed by the date it was ordered for:

⁶⁹ Dealer is another word for intermediaries in the industry.

[*Intermediary speaking*] Disappointments happen for various reasons. For one, it can be linked to the timing of the customer; some do not start the [ordering] process early enough.

As a result

... [the intermediary] encourages people to start the ordering process early to avoid a rush towards the time of the event.

Furthermore, some weavers will often not accept orders with tight deadlines:

[The weaver] stressed that she would not collect “materials” for an order if an agreement cannot be reached on collection date. Stressing that she does not do “express”⁷⁰.

~

This means that intermediaries must be able to balance the expectations of the buyer with the capability of weavers. This involves having access to more than one weaver, knowing the resources available to different masterweavers – some have more weavers working with them and can complete orders faster, and also having the ability to tap into weaving networks. As explained by one of the weavers interviewed, orders can be sourced direct from intermediaries/buyers or from other weavers:

...because they all tend to know [of] each other, information of who has work and who is looking for work passes around. Thus orders are distributed amongst network members

Providing guarantees on deadlines however comes with its own risks, particularly when the buyer changes the amount of fabric ordered. Intermediaries and weavers have come to expect buyers to request more fabric than their initial order.

... [these last minute increases in order size] can be attributed to people not paying on time and reluctance on [the part of buyers] to expose [themselves] to debt by ordering and paying for more fabric than will be used.

⁷⁰ ‘Express’ refers to completion of orders within tight time frames and can be translated as ‘express delivery’.

Whilst helping to reduce the financial exposure of the buyer, managing the irregular placement of orders adds to the 'stress' experienced by intermediaries and weavers and increases the likelihood of disappointment.

In response, intermediaries and weavers always make more units than initially requested by the buyer. They therefore carry an inventory of finished products, which although increases their exposure to financial risk (in that any fabric the buyer does not buy must be sold independently), at the same time mitigates against the risk of disappointing the buyer should they request for more fabric as the date of the event/use of fabric approaches.

Buyers can however also reduce the size of their order; this proves particularly problematic when raw materials have already been procured and/or the fabric has already been produced. This is particularly common with *aso ebi* orders (see 2.4.3). To avoid having to pay for fabric that will not be used and thus reduce their financial exposure, buyers will place orders with intermediaries rather than weavers. This is because intermediaries will receive returned fabric which they then resell.

In summary, there are two main intermediary activities exhibited under this category of uncertainty: the first is the encouragement of trade in the form of the provision of advice, and the demonstration of competence via the production of samples of the buyer's preferences. This informative role of the intermediary cannot be emphasised enough, *aso oke* is an occasional good (i.e. it is not a purchase that is made regularly) and as such buyers know very little about the characteristics of the product and also of the transaction. Furthermore, intermediaries act as a central place of exchange (of information, money, and fabric) for many buyers and sellers. This centrality adds to the number of potential trading partners, and thus increases the likelihood of buyers and sellers finding a suitable trading partner. This

centrality also helps to reduce the cost of looking for a suitable trading partner (i.e. 'search costs').

The second intermediary activity observed is the holding of finished goods inventory. On the one hand, intermediaries hold inventories of goods and stand ready to sell to customers; they are therefore best placed to deal with excess orders by buyers. On the other hand, intermediaries have more capital available to them than weavers and stand ready to buy goods from raw materials suppliers. They can therefore commission weavers to produce more fabric than that ordered by the buyer. In this manner, intermediaries reduce the uncertain nature of the market by helping to clear markets, smooth out fluctuations in the patterns of demand and supply, avoid the 'coincidence of wants'⁷¹, and thereby reduce the risks of exchange (Spulber, 1999).

3.4 Response to Uncertainty about the Supply of Raw Materials

This uncertainty relates to the unstable supply of thread in the market and was described (in section 2.3) as resulting in an increase in the effort or stress associated with completing orders, which can lead to an elongation of the order fulfilment process. This uncertainty also causes an increase in the risk of customer dissatisfaction which, due to the referral nature of the industry can reduce the perception of potential buyers and lead to a reduction in sales.

3.4.1 Holding inventory

A recurring concern voiced by participants was that the required "shade" (colour) of thread needed to fabricate an order would become unavailable ("run out") in the market at some point during the order fulfilment process. A response to this has been to buy all the thread required for the entire order

⁷¹ Refers to a situation in which a buyer and seller need to transact with each other at the same time.

at the start of the order fulfilment process. A typical observation made by intermediaries is that:

It is ...necessary to buy the thread in bulk so that it does not run out during the course of producing the order, decreasing the likelihood of colour inconsistencies, as it cannot be guaranteed that the same shade would still be available in the market.

As stated in the quote above, in the absence of inventory being held, suppliers of the fabric run the risk of delivering fabric of different shades of the colour specified by the buyer. As noted by one of the buyers interviewed:

...people's experiences when ordering in large quantities was that the initial products were good but as the numbers (of ordered fabric) increased the colour of the thread would begin to change.⁷²

Such colour inconsistencies result in consumer dissatisfaction, and are an element of the dissonance phenomenon referred to as 'disappoint'. 'Disappoint' is costly in terms of both reputation and resources -as the raw materials and manpower expended on making fabric that does not conform to the customer's specification is wasted⁷³. Strategies that can reduce or eliminate the occurrence of disappointment are therefore pursued (i.e. to the extent that the price of pursuing these strategies is lower than the cost of 'disappoint').

Holding inventory requires funding, which is provided (principally) by the buyer in the form of a deposit. The value of the deposit (in proportion to the cost of the order) was generally specified as being three quarters or 75 percent of the final bill. Some of the weavers interviewed reported asking for

⁷² It should be recalled that the distinguishing feature of large orders (referred to as *aso ebi*) is that they are identical in colour and design, as they are used as a type of "uniform", identifying groups at an event. Buyers therefore deem variation in colour as unacceptable.

⁷³ On occasion, particularly when the consumer placed the order through an intermediary, inconsistent fabrics are returned and are either replaced with more consistent products or the monetary value of the fabric is refunded.

more (with some stating that they preferred to be paid the total value – i.e. 100% of the order upfront). However, due to uncertainty about weaver behaviour (see section 2.4.1) this is rarely agreed to. For this reason, in all instances cited during the field study, the monetary value of the deposit was assessed in terms of its ability to buy all the required thread.

However, there are risks associated with holding inventory. In particular the intermediary is exposed to significant financial risk, especially if the buyer later changes their design preferences. This makes payment of a deposit all the more important:

[Intermediary speaking] ...Insistence on payment of a deposit arises out of experiences in which customers change agreed colour combinations after raw materials have been purchased. In such cases, thread brought for the order have to be returned, something that is not easily done.

In such circumstances the intermediary must find a way to return, resell or recycle the purchased thread, and start looking for the new colour of thread required for the buyer's revised order. An inventory of this new thread will also be required and the additional time and resources spent is borne solely by intermediary. Obtaining a deposit from the buyer is therefore a way of fixing the terms of the contract and many intermediaries emphasise that deposits are non-refundable.

Financial exposure associated with holding inventory is in some instances reduced by obtaining credit facilities with thread sellers/dealers. Such facilities are however the exception (rather than the rule) and predicated on an established trust-based relationship between the parties.

3.4.2 Coordination of search strategy

At times, the colour of thread required to complete a buyer's order cannot be found even after a comprehensive search has been conducted in the market.

The search for thread often follows a geographic pattern that is dictated by the order quantity. Small quantities of thread are firstly sourced from traders that are geographically local. This substantially reduces the cost and effort to the intermediary/weaver. The search is then expanded geographically when the required shade of thread is not available locally. This expansion extends firstly within the town or city the purchaser resides in and then to known wholesale markets or centres. These centres may be other towns/cities or specialised cloth markets:

[Weaver speaking] The "thread" is purchased at various markets, but it is firstly sourced at markets nearer to the shop [for example "Penn Cinema", Agege] and then at more distant ones ["Maternity", Lagos Island] if the thread is not available locally.

[Intermediary speaking] The situation [i.e. supply/availability of thread] has however improved over the past 5 years and if a shade cannot be found in Ibadan it is usually obtainable in Lagos ... Oje is a specialised market for aso oke. The intermediary mentioned it in reference to buying thread, stating that thread sellers also gather there as well as at Ogunpa [a market near the Ogunpa river in Ibadan].

Another factor influencing search strategy is the existence of a trading relationship (built as a result of repeat purchases) with a thread seller. Where a relationship exists, the trader is contacted first for the thread and should the required shade be unavailable (or not in stock), the trader may (on the purchaser's behalf) search for the required shade, asking other thread sellers or getting in touch directly with manufacturers/importers.

[The weaver] buys from/deals mainly with three people but will expand his search if a particular shade of thread is hard to come by.

[With reference to an intermediary that has an established relationship with a thread seller] When a particular type or colour of thread is unavailable, the thread seller will often obtain it from, or recommend an alternate seller.

These two factors, i.e. the geographic proximity between thread dealer and intermediary/weaver, and the existence of a trading relationship, can also

occur in combination. Thus the weaver quoted above as dealing mainly with three people makes use of one of these traders more than the others, and this preferred trader has her shop located geographically closer to the weaver's workshop than the others.

The two factors - geographic proximity and establishment of a trading relationship - can also conflict with the establishment of a trading relationship exerting more influence than geographic proximity. For example, one of the intermediaries interviewed has a relationship with a trader whose shop, though geographically distant from her own premises, is located near the workshop of her weavers. In this case, when an order has been obtained the intermediary has the option of referring weavers to this trader for thread:

[Intermediary speaking] With respect to the thread trader at Ota, weavers from the workshop in that area have on occasion been sent to her [by the intermediary] to pick up thread. Payment for such purchases is made at the earliest opportunity.

Lastly, in a case where geographic proximity has no influence on search strategy, one of the intermediaries interviewed deals directly with manufactures of thread overseas and imports thread required for orders into the country. This allows for maximum control over the supply of thread for orders and improves the level of service extended to buyers. At times, and depending on factors such as access to capital, the size of the order, delivery time, surety of customer etc. the intermediary can request for the production of a specific colour/shade of thread. Such a request significantly increases the intermediary's exposure to financial risk, thus more often than not, when a particular shade of thread cannot be found in the market, a new sample of the order is produced using a similar shade.

3.4.3 Generating alternatives

As described above, alternative samples of an order using similar shades of thread are produced when the desired shade is unavailable in the market. These samples are then shown to the buyer for approval. Once this has been achieved, the need to build up an inventory of the new shade sets in and arrangements for procurement are made.

Both weavers and intermediaries also spoke of occasions where colour inconsistencies occur as a result of manufacturing error:

[Intermediary speaking] Even then, colour can vary in thread batches due to the manufacturing process and at times the colour of the thread does thin out in spools made towards the end of the production batch.

This tends to occur with large purchases of thread. Under such circumstances the customer is contacted to view the colour variation, and most times a similar shade of thread is used in completing the order.

In summary, the search for thread is at first driven by the size of the order and tends to start with thread traders that are located close to the intermediary/weaver. For larger orders, because of the quantity of thread required, search for thread bypasses the immediate local geographic area and moves to larger (more concentrated) centres.

Search strategy is also influenced by the presence of a relationship with a thread trader. Relationships are built with more than one trader at different geographic locations; this reduces and spreads the risk of being dependent on a particular trader. When a particular shade of thread is difficult to locate the intermediary/weaver can rely on the traders' knowledge and network to find it and in this way significantly widen the scope of the search.

Furthermore, where an intermediary's business is vertically integrated with that of weavers and a relationship exists with a thread trader, the search for raw materials may begin with the trader located nearest in location to the weavers (this is usually not close to where the intermediary's business is located). This balance between the geographic proximity between the thread trader and purchaser, and the use of established relationships with traders is done to reduce the time and cost of searching for raw materials (and by extension that incurred in completing the order).

Cost considerations (particularly that associated with the loss of a trade opportunity) are also a motivating force in the generation of alternatives when a particular shade of thread cannot be found. These activities (i.e. those relating to the lowering of the cost of matching and searching) are further examples of intermediary activity in the *Aso Oke* industry, in that intermediaries seek out suppliers, as well as find and encourage buyers to transact (Spulber,1999).

3.5 Response to Uncertainty about the Behaviour of Trade Partners

Uncertainty about the behaviour of trade partners relates specifically to the possibility that even though the terms of a transaction have been agreed upon, one party to the transaction can change his/her behaviour to the detriment of the other party. Consequences of this uncertainty include the perpetuation of a negative image of the industry as people recount stories about their bad experiences (negative word-of-mouth). This creates and maintains a lack of trust between participants and high levels of suspicion. As a means of protecting themselves, trading parties increasingly look out only for their own interest and this can lead to market failure in that looking after their own interests causes potential buyers to avoid the industry.

Three examples of this type of uncertainty were provided in section 2.4 – these are uncertainty about the behaviour of weavers, surety of customers, and changes to trade agreement by buyers. The following sub-sections discuss the responses of the industry.

3.5.1 Integrated organisations and close, durable relationships

The distrust that exists between the different types of suppliers in the industry – intermediaries and weavers – stems primarily from uncertainty over the use of money. Some of the weavers interviewed suggested that payment by intermediaries/buyers of the full cost of the order ‘brings out the work faster’ – that is ensures that the order is completed in the shortest time possible. However, intermediaries/buyers rarely (if ever) pay the full cost of an order in advance and have a different perception of what ‘brings out the work faster’:

... [when a large sum is required to buy all the thread required for an order, the intermediary] has to play a more supervisory role; distributing the required thread [to the weaver], adding extra money for the yarn and labour, which “brings out the work faster”.

Weavers are known to utilise deposits for other purposes/expenses that are not related to the order (see section 2.4.1) and as such require monitoring. Monitoring is however costly and intermediaries prefer to establish relationships that are based on an ownership contract or on trust (built over a series of repeat purchases).

Under an ownership contract, the weaver(s) agrees to work solely for the intermediary (for a specified period of time) in return for a steady flow of orders and, under most circumstances, provision of accommodation and suitable work environment. Weavers under this type of contract are paid per unit of fabric produced rather than a constant monthly fee/salary. This

payment option limits the financial liability of the intermediary as the weaver is not paid if orders have not been secured.

Intermediaries that cannot afford the extra costs of employing contract weavers tend to build relationships with several weavers and make sure that these weavers are aware of each other:

[The intermediary] identified a need to use multiple weavers and to encourage competition between them [for instance, all her weavers know each other]. This reduces her exposure to any one weaver and ensures she is not "held to ransom" by anyone.

The more reputational capital a weaver is able to build through the prompt delivery of high quality fabric and proper utilisation of deposits, the more orders they will be able to secure with intermediaries. The competition created between weavers, whilst promoting greater accountability and trustworthiness, however results in greater distrust between weavers, particularly when coupled with a decreasing market and/or increasing pool of weavers. One of the weavers interviewed:

...learnt of the demand for skilled weavers through a neighbour. [The weaver] stressed that back then there was little competition unlike now where there is a lot of backstabbing.

Even when a vertically integrated organisational structure exists and weavers are employed to weave solely for one intermediary, there is still the need to monitor and control the activities of the weavers. This is because it is possible that these weavers may undertake work for other intermediaries at the expense of their employer's orders. One intermediary with this arrangement provides security (in the form of a guard) at the location in which she houses her weavers. This according to her ensures that she can "keep track of their (i.e. the weavers') visitors".

Worse still, the weavers may be lured away by other intermediaries leaving their employer stranded and taking with them knowledge of proprietary ideas (e.g. mix of different types of thread to get a particular texture and/or consistency of fabric etc.). These proprietary ideas can then be used for the benefit of their new employer who has not invested in the creation of such knowledge. The same intermediary that now uses a guard to monitor her weavers explained that:

She initially had 4 (Ghanaian) weavers working for her but they were lured away from her by other intermediaries with the offer of more money, so she had to go back to Ghana to recruit other weavers to come and work for her.

These occurrences of 'stealing' ideas and employees fuel the distrust that exists between intermediaries. Whilst originality of ideas and design has been reported as not being a key distinctive feature among weavers but rather a way of building competence within the industry (Clarke, 1999), it is a critical success factor for intermediaries. One intermediary attributed her reputation in the industry to her "unique designs, particularly her flair in combining/matching colours". In another interview, a buyer stated that her decision to use a particular intermediary was due to the "unique designs" attributed to her. With little motivation to legally protect and enforce design innovations (due to weak institutions and enforcement procedures), theft of ideas and designs translate into a reduction of the distinctive competence of intermediaries and results in the lowering of their competitiveness. To guard against this the committed intermediary with financial resources will keep all aspects of the business in-house, building up an integrated organisation consisting of weavers as well as providers of value-added services, for examples tailors and embroiderers.

3.5.2 Supervise and monitor agreement or contract

The need for monitoring and control has been introduced in the section above. Distrust between participants in the industry also stems from bad experiences encountered when part of a large order has to be outsourced to another weaver in order to complete it by the stated delivery date. Distrust under such circumstances arises because the weaver that owns the order is not sure that the outsourced weaver will complete the order and that the order will be completed according to specification. Both uncertainties require monitoring and control activities. The impact of the former of these two uncertainties can also be reduced by weavers developing partnerships with other weavers that they trust – these partnerships tend to be between family-related weavers, or with masterweavers that have more of a reputation at stake. With regard to the uncertainty about conforming to specification, the weaver that owns the order adopts an intermediary approach in co-ordinating the fulfilment of the order:

... [this weaver] would split up the order, produce a batch himself [with his weavers] and approach other masterweavers to help with production explaining the pattern/giving them a sample, the thread required for the order, and telling them the quantity required and delivery date. In terms of delivery time/date, he would always quote an earlier time/day than that quoted to the buyer.

Distance (in terms of differences between the physical locations of places) increases the cost of monitoring and co-ordination. As a result outsourcing partnerships tend to be built with weavers that are located geographically near to each other (for example in the same town, district or city). When orders have to be fabricated at a geographically distant location⁷⁴, weavers

⁷⁴ Two factors are important in determining when to take orders to other parts of the country (e.g. Kogi State) to be produced. The first is the size of the order. One of the vertical loom weavers stated that large orders [60 pieces and above] are split in half; one half is woven in Lagos and the other half in Kogi. The second refers to the width of the material required. The *Iro* is of a width that makes it too strenuous for 'young' women to weave. 'Elderly' women that are past childbearing age therefore weave it.

tend to appoint a co-ordinator at the location to oversee the weaving process and monitor production on their behalf:

When an order is taken to Kogi, it is handed over to one person that acts as a co-ordinator ...It is this co-ordinator that then gives/distributes the order among weavers in the community and co-ordinates their weaving ...the [weaver that took the order to Kogi in the first place] will return to Lagos to complete the half of the order being carried out there. She therefore needs just one point of contact in finding out the status of the order and communicating changes [which she does by telephone]

The impact of distance is also seen in the relationships intermediaries form with weavers. In general, and so as to facilitate the monitoring of orders, intermediaries prefer to build relationships with weavers that are located geographically near them:

Over a period of time, and principally as a result of a greater degree of convenience, Ghanaian weavers tend to be used more than Nigerian weavers. Not only are they located on the outskirts of Lagos as opposed to distant rural/urban centres, their workmanship is also classified as better than those of Nigerian weavers.

The horizontal loom weavers the intermediary gives orders to are located very close to her house [walking distance]. With these weavers, after the start of an order, she usually goes to their workshop to monitor them

In summary, the actions of buyers and sellers in the industry are difficult to predict and costly to observe. The threat of opportunistic behaviour in the industry is therefore high - that is the threat that a partner in an exchange will for their own gain, use whatever advantage they have over the other party to the exchange. This has led to the exhibition of high levels of distrust between trade partners.

Responses to this distrust fall under two categories; first is the development of systems/strategies to monitor behaviour that is backed up by sanctions. Distance however increases the cost of monitoring and co-ordination, and the spatial nature of the *Aso Oke* industry has resulted in a preference for geographically 'local' trade relationships; even when fabrication has to occur

at a distant location, participants favour structures in which control and monitoring is local to the place of production⁷⁵. The second response (which is not independent of the first) is the development between suppliers of close, durable relationships based on trust and 'reputational capital' or integrated organisation structures.

3.6 Summary of Intermediary Activity

As stated in the introduction to this sub-section the instabilities created by the uncertainties that exist in the Aso Oke industry are managed through intermediation. Intermediary activities identified in the industry include:

- a. Holding of raw material and finished goods inventory
- b. Generation of alternatives to encourage trade
- c. Provision of product and transaction guarantees
- d. Definition of trade agreements and contracts
- e. Monitoring and supervision of agreements and contracts
- f. Clearing of markets and evening out of fluctuations in demand and supply

The benefits to the industry arising from the conduct of these activities have been discussed in the preceding sections and are summarised in Table 15. The findings of this section therefore support the second supposition of this thesis, which is that:

The types of information imperfections that are present in the market determine the intermediation activities that can be observe.

⁷⁵ This is also exemplified in buyer - intermediary trade relationships. For national (i.e. orders outside Lagos) and international orders, the buyer requires someone, who lives in closer geographic proximity to the intermediary, to act on their behalf and be responsible for paying the deposit and final bill, and collection of the finished fabric.

Table 15: Summary of uncertainties in the Aso Oke industry, responses to uncertainties, and the outcomes of these responses

	UNCERTAINTY	RESPONSE	OUTCOME
1	<p>Uncertainty about new orders</p> <p>High susceptibility to trade and demand fluctuations</p> <p>Concentration of demand in densely populated areas</p> <p>Reluctance to turn away orders even when there are no or limited resources to fulfil the order</p> <p>Short-term orientation to transactions. Participants get the most out of each other and transaction</p>	<p>Development of reputational capital</p> <p>Migration to areas with concentrated demand</p>	<p>Increases confidence in industry</p> <p>Increases probability and frequency of orders which serves as a disincentive for adopting short-term orientation</p>
2	<p>Lack of knowledge about the product and transaction process</p> <p>Difficulty in predicting requirements and managing expectations of buyers</p> <p>Increase in effort/stress associated with completing orders.</p> <p>Market failure as buyers use alternative fabric(s) for their events</p> <p>Adverse selection arising from buyer's inability to assess the quality of the textile</p>	<p>Building awareness of capabilities of suppliers and the way trade is conducted in the industry</p> <p>Provision of product and transaction guarantees</p> <p>Holding of finished goods inventory</p>	<p>Reduction in customer dissatisfaction</p> <p>Industry becomes more predictable</p> <p>Encourages trade between suppliers and buyers</p>

	UNCERTAINTY	RESPONSE	OUTCOME
3	<p>Uncertainty about the availability of raw materials</p> <p>Increase in effort/stress associated with completing orders that can result in an elongation of the order fulfilment process</p> <p>Increase risk of customer dissatisfaction</p>	<p>Holding of raw materials inventory</p> <p>Coordination of search strategy - including building of trust-based relationship with thread dealers</p> <p>Generating alternatives when required shade of tread is not available in the</p>	<p>Encourages trade between suppliers and buyers</p> <p>Intermediary's exposure to financial risk increases.</p> <p>Risk of 'Disappoint' decreases for buyer.</p> <p>Elongation of order fulfilment process</p>
4	<p>Uncertainty about the behaviour of trade partner - that one party to the trade will change their behaviour to the detriment of the other party once a transaction has been agreed upon</p> <p>Lack of trust between participants in the industry. High level of suspicion</p> <p>Trading parties look out only for themselves</p> <p>Market failure as buyers use alternative fabric(s) for their events</p>	<p>Increased supervision and monitoring</p> <p>Define trade agreement</p> <p>Hold inventory of finished product</p> <p>Develop close, durable relationships based on trust and 'reputational capital', and/or systems of monitoring behaviour that are backed up by sanction</p> <p>Adopt integrated organisational structures</p>	<p>Elongation of order fulfilment process; increase in tasks (and related 'stress') for the intermediary</p> <p>Exposure to financial risk is reduced for the buyer but increases for the intermediary.</p> <p>Probability of experiencing dissatisfaction increases for intermediary/weaver.</p> <p>Risk of 'Disappoint' of buyer decreases.</p> <p>Encourages trade between suppliers and buyers</p>

4 Organisation in the *Aso Oke* Industry

This thesis suggests that participants in an industry organise themselves into structures for conducting trade so as to minimise the costs incurred in accomplishing transactions. This suggestion is in line with economic thinking that takes a transaction cost perspective on the existence of firms (Alchian and Demsetz, 1996; Coase, 1996; Williamson, 1975). Furthermore, when faced with alternative structures, these participants will adopt the least costly one that meets their purpose/objective. This sub-section describes the alternative structures identified in the *Aso Oke* industry. These structures are: direct exchanges between buyers and weavers, mediated centralised exchanges in which trade is via intermediaries, intermediated exchanges in which the masterweaver also performs intermediary activities, and vertically integrated organisations.

The first three forms were first identified during the exploratory (or pilot) study conducted in the early stages of this research and reported in Chapter 6. These diagrams have been reproduced below to facilitate the description of the different organisational alternatives. The last organisational form – vertically integrated structure (see Figure 51) was uncovered during the main data collection phase/field study of the research.

The diagrams borrow from the notation adopted by Casson (1997) in which material flows are identified as block lines, units that generate or transform material flows by boxes, information flows by thin lines, and individuals that handle the flow of information by circles. A circle within a box represents an individual that handles the flow of both information and physical goods.

All diagrams identify four stages of production: the sourcing of raw materials (R), the production of the fabric (W), and the consumption of the

fabric through use (C). Often, the fabric also has to be worked upon by a tailor (T), particularly if the textile has been woven in strips, in which case it has to be “joined” or sewn together into a sheet of fabric.

4.1 Direct Exchange between a Buyer and a Weaver

The spatial arrangement in direct exchanges is such that depending on the characteristic of an order for *aso oke*, in particular the type of thread or yarn required; the sourcing of raw materials can occur either within or outside the physical geographic location of the weaver (see section 3.4.2 – the coordination of search for thread). Also, depending on the location of the weaver and customer, the delivery of finished cloth orders to the customer may or may not occur across geographical boundaries.

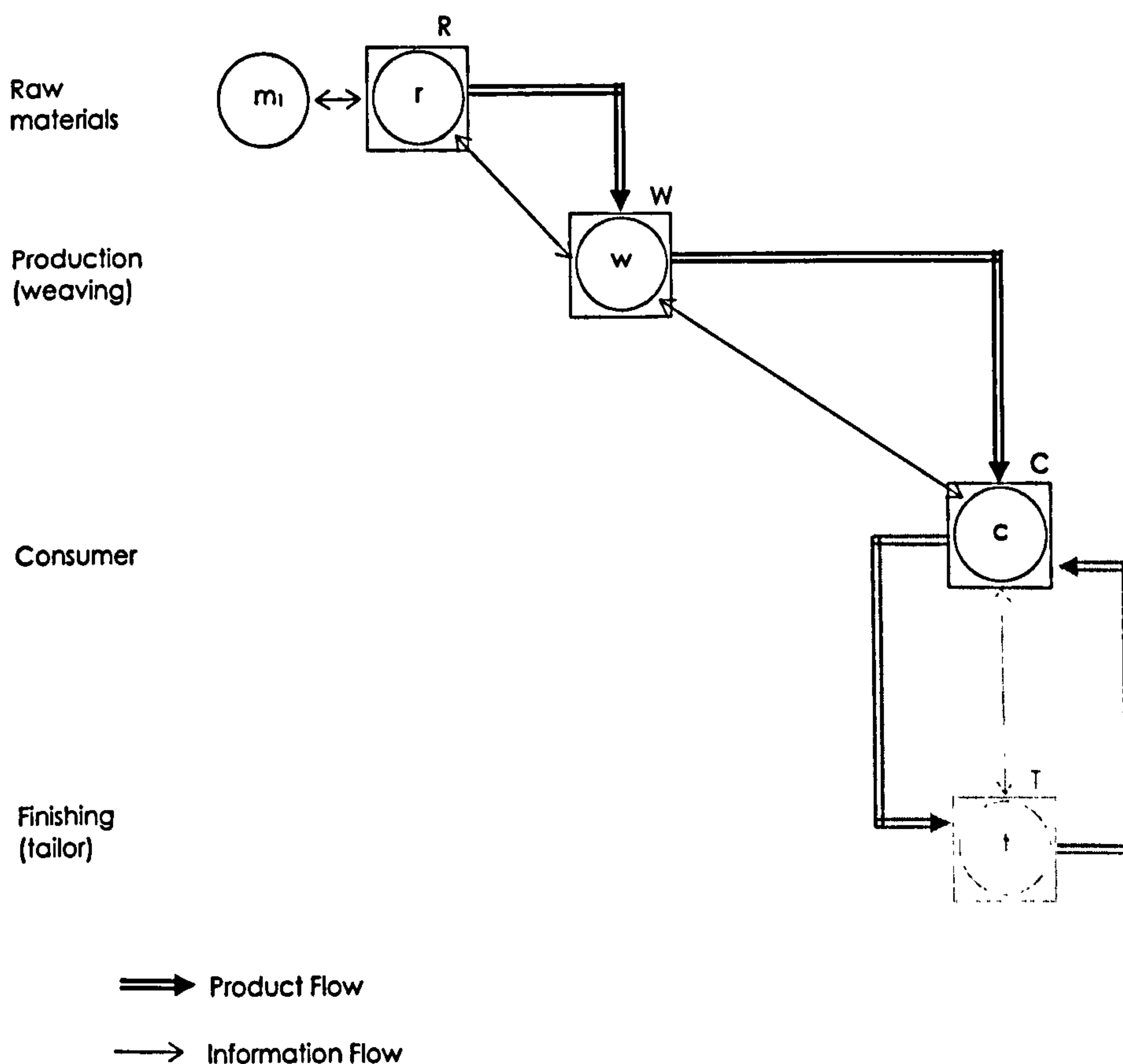


Figure 49: Information and Material Flow Diagram: Direct Exchange

Customers however tend to always use tailors that are located in the same geographic space as themselves. In Figure 49, “m” is used to identify

mediating activities. These are shown to occur in relation to the acquisition of raw materials. The individual r (for example a seller at the market) manages the sourcing and sale of raw materials and relies on individual m_1 (importer of thread or local manufacturer) to import these raw materials into his/her geographic space. Individual w is responsible for production, individual t for finishing, and individual c is the consumer. In Figure 49, there are no intermediaries between the consumer and weaver, and between the consumer and tailor.

4.2 Centralised Exchange: Intermediary Only

As in the case of direct exchanges (Figure 49), depending on the location of the weaver, the sourcing of raw materials for production and delivery of finished products might occur within or outside the same geographic space. However, in this instance, the 'pressures' of distance are borne predominantly by the intermediary who coordinates the activities of the different participants.

The basic structure of the flow of information also remains the same as that of the direct exchange organisation. Individual r still manages the sourcing and sale of raw materials, at times relying on individual m_1 for importation of some materials into his/her geographic space. Individual w is responsible for production, individual t for finishing, and individual c represents the consumer.

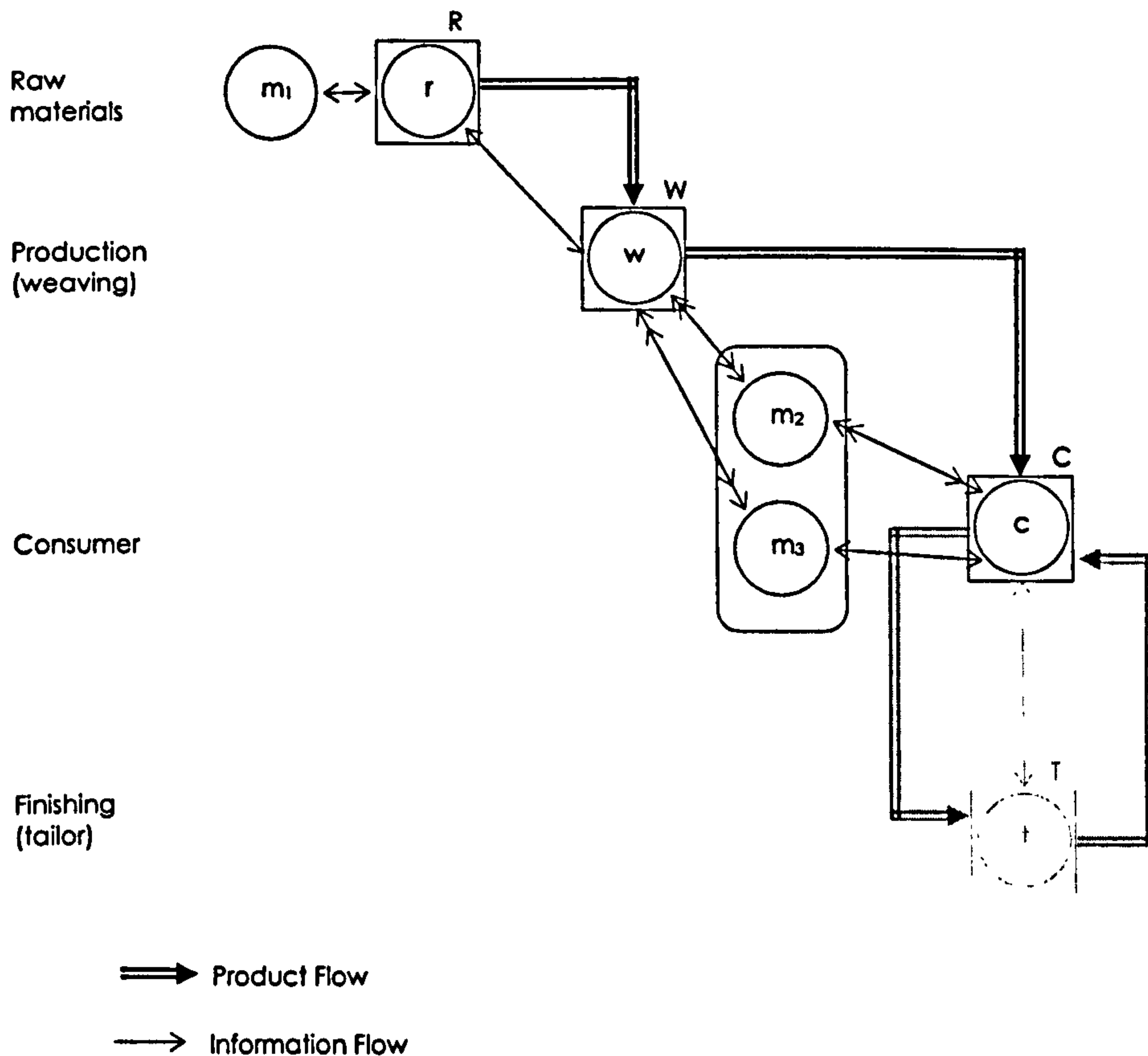


Figure 50: Information and Material Flow Diagram: Central Exchange with Intermediary

However, under this arrangement, individuals w and c do not interact. Instead they rely on an intermediary who performs two key mediating functions. The first, m_2 refers to the coordination of an order and is represented by double-headed bi-directional arrows because the information being communicated has to be verified as reliable. The consumer needs to be assured that the quality of cloth ordered will be the one delivered; that the price being negotiated is fair; that delivery promises will be kept etc. In turn the intermediary needs to be assured of these same factors when negotiating with the weaver. Double-headed bi-directional arrows therefore indicate relationships that require a higher level of trust and accountability.

The second function m_3 relates to instances in which the intermediary must sell late or returned products on behalf of the weaver. In such instances (because of the customised nature of the goods) money is not received by the

weaver until a buyer has been found for the cloth. The weaver must therefore trust the intermediary to market the cloth and sell at an appropriate price. Both functions m_2 and m_3 are carried out by the same individual and this is represented in the diagram by the oval box drawn around the corresponding circles.

4.3 Centralised Exchange: Intermediary and Masterweaver

As in the other two organisational forms, the sourcing of raw materials for production, outsourcing of orders, and transfer of finished products can occur within or outside the same geographic space. However, in this type of organisation, the masterweaver takes on some intermediary responsibilities. In fact, from the perspective of the weaver, the intermediary may be identified as just another representative customer.

This arrangement was exemplified by the experiences of a female weaver (from a region known as Akwete, located in Abia State, eastern Nigeria). This weaver had at the time of the interview three (female) weavers working with her in Lagos. However, whenever she receives large orders for fabric she travels from Lagos (south-west Nigeria) to Akwete to outsource part of the order so as to meet the completion date. The weaver confirmed that other indigenes of the town that had migrated to urban centres also bring orders to the town for completion. This practice adds to the economic viability of not only the female weavers unable to migrate but also the town in general.

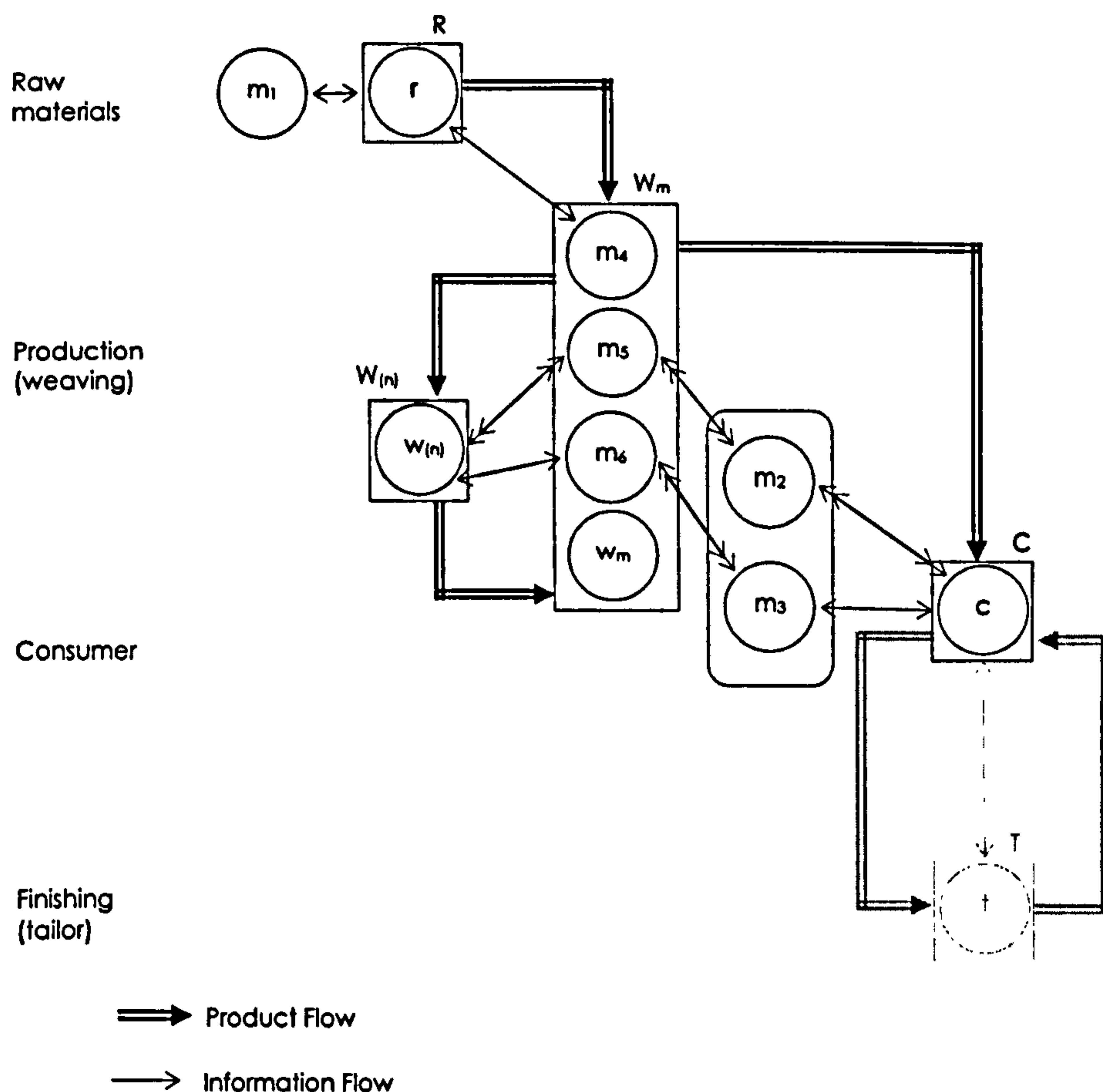


Figure 51: Information and Material Flow Diagram: Central Exchange with Intermediary and Masterweaver

As this structure is often adopted when orders are especially large, the masterweaver has more leverage/bargaining power when procuring raw materials. Therefore m_4 refers to the coordination of the purchase of raw materials between individual r and the masterweaver. Individual t remains responsible for 'finishing' the product and individual c is a representative consumer.

Individuals w and c do not interact directly and neither does the intermediary with the weaving subcontractors (w_n). Whilst the intermediary still performs the two mediating functions m_2 and m_3 , these functions are replicated by the masterweaver when dealing with his/her subcontractors (m_5 and m_6). Differences however arise in relation to m_6 (i.e. instances in which the masterweaver must sell late/returned textiles). As the

masterweaver maintains ownership of the cloth throughout all stages of production, the subcontractors bear none of the risks.

It is the masterweaver that purchases and distributes the raw materials, and that has committed to a design, quality level and delivery date. Whilst subcontractors are also concerned about matters relating to quality, conformance to design, and timely delivery (so as to secure future outsourcing contracts), their monetary exposure is negligible. Should an order be late, the masterweaver, having his capital tied up in the cloth is obliged to still receive the cloth from the contractor. Also, in order to maintain his/her reputation, the masterweaver will also pay the contractor (although often not at initially negotiated fees). The information flow between the subcontractor and m_6 is therefore a single-headed bi-directional arrow, rather than a double-headed one. The flow of reliable information is represented by a double-headed arrow, and is differentiated from a flow of ordinary information which is represented by a single-headed arrow.

4.4 Vertically Integrated Organisations

In addition to engaging in direct exchanges, weavers also obtain orders through established relationships with intermediaries and outsourcing partnerships with other weavers. Some weavers also align themselves with a representative weaver who coordinates the collection of orders from different intermediaries. One intermediary gave a description of a weaver:

...who moves between different intermediaries collecting orders. This person is well educated and is Ebira [an indigene of Kogi State], the weaver is a masterweaver in that she does not weave but manages production of orders. This masterweaver gives out her telephone number and [the intermediary] calls when an order comes in.

Such a coordinating role is in fact intermediation. In this case, the intermediary may be described as performing demand-side intermediation

that is focused on establishing contact with buyers and managing their side of the trade. The masterweaver can be said to provide supply-side intermediation – focusing on the production of the order and managing the relationship with weavers to whom part orders have been outsourced.

In this new form of intermediation the masterweaver builds up a network of weavers that are available to work and controls a bigger workforce than would have otherwise been possible. The masterweaver can therefore accept many more orders and is able to build up experience in the industry much faster. The masterweaver also takes the responsibilities of supervising and monitoring weavers away from the intermediary and is able to build up a reputation and expert knowledge regarding such activities. It may be that as their profile and reputation increases, this new form of masterweaver may grow to become like the existing intermediaries in the industry.

Whether it is the masterweaver-coordinator or intermediary acting as the mediator, this person takes ownership of the productive entities of the industry (i.e. weavers and tailors) or of the activities they are performing. The activities of sourcing for raw materials (R), the production of the cloth (W), finishing of the cloth (T), and the consumption of the cloth through use (C) also exist under this arrangement (as in Figure 49 to Figure 51). However, in this instance, production and finishing with the aid of m_t occur within the same 'organisation'. Individuals w and t are recruited to work exclusively either for the intermediary or are contracted for the duration of the order. Furthermore, activities relating to the purchase of raw materials also originate within the organisation with some intermediaries even sourcing for materials directly from factories rather than from traders.

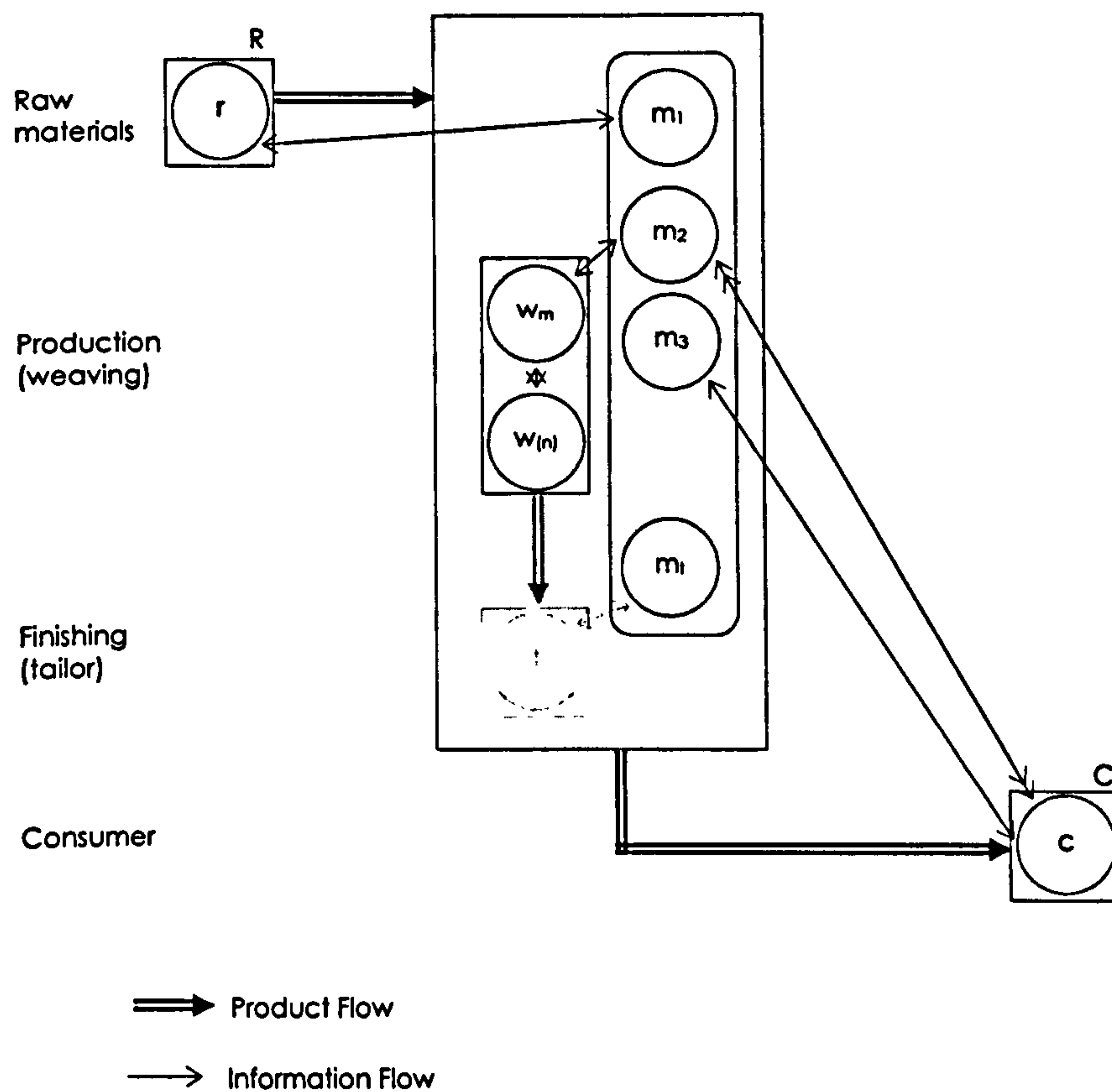


Figure 52: Information and Material Flow Diagram: Vertically integrated structures

The flow of information regarding the design and trade requirements between the consumer and mediator (m_2) is still represented by double-headed bi-directional arrows, indicating requirement for a higher level of trust and accountability. However, because of the control the mediator has over the weavers, the communication of these requirements to weavers is represented by a single-headed bi-directional arrow. A single-headed arrow also represents the sale of excess or returned fabric (m_3). This is because the mediator maintains ownership of all stages of the fabric, from the purchase of raw materials to its sale to the consumer. Weavers and tailors are paid for the fabric they have produced irrespective of whether or not some are later returned.

4.5 Summary of Organisational Forms

Participants in the industry have developed a number of structural responses to continue trading under the conditions of uncertainty and instability

described in sections 2 and 3. These organisational structures can be broadly summarised as:

- a. relationships with trade partners performing different roles in the industry (e.g. between thread sellers and intermediaries)
- b. outsourcing partnerships between individuals that perform the same/similar roles (e.g. between weavers)
- c. and vertical integration - whereby one participant exercises ownership over the processes performed by another participant (e.g. an intermediaries employing weavers and tailors to work exclusively for them).

The structures described above are however generalized forms and variants or hybrids exist within and amongst them. The type of structure adopted in trade depends on two main factors, namely the origination of the order and the size of the order.

This research found that buyers of *aso oke* have two alternatives open to them; they can either approach weavers directly or go through intermediaries. This research found that whilst there were cost savings (with respect to negotiating a better price for the fabric) to the buyer in dealing directly with a weaver, the costs associated with this (including that of finding a suitable weaver, of being disappointed by the weaver, and risk to personal safety associated with travelling to weaving locations etc.) made it a less attractive alternative. Thus for buyers, the least costly structure is to use the services of an intermediary.

In relation to the production of the fabric itself (i.e. the structure between intermediaries and weavers, and between weavers), three broad types of structures were identified and as noted in they are: relationships (built over repeat transactions) between independent participants in the industry,

outsourcing partnerships, and vertically integrated organisations. The type of structure adopted depends largely on the resources available to the participant.

Vertically integrated organisations are to the intermediary financially the most costly. Yet they offer the greatest control over the final product. To weavers, integration is the most costly structure with respect to autonomy but it is also the most secure in terms of revenue. Although intermediaries do not pay weavers a fixed salary (remuneration is usually per order completed) the responsibility of securing/providing orders rests on the intermediary. For intermediaries who can afford to make the commitment to the industry, and weavers that prefer the (relative) stability of working exclusively for an intermediary to the uncertainty of going it alone, vertically integrated organisations represent the best alternative.

For intermediaries that cannot afford to recruit weavers, relational structures represent the best alternative. To better understand how affordability of vertical operations is assessed, it is necessary to understand the motivation behind some intermediaries' involvement in the industry. Trading in *aso oke* is not a full-time or primary business for most intermediaries; for example one intermediary:

...took up this role [about 10 years ago] upon retiring from a career in education and devotes approximately 4 days a week to the running of the "business". [Trading in *aso oke*] was recommended to her as a natural choice given her interest in fashion; she referred to it [during the interview] as a *hobby*.

Another intermediary started selling *aso oke* only as a gift item. According to this intermediary, her customers

...would purchase the fabric as a birthday gift, or as an item in a traditional wedding dowry. She then began to get requests for *aso ebi* fabric for use by family/friends of celebrants of an event.

The cost of recruiting and housing weavers as well as advertising and sourcing for orders, the effort (and stress) as well as the risks associated with this arrangement make vertical integration unattractive to these intermediaries and relational structures more attractive.

Outsourcing partnerships were seen to occur between weavers when a large order needed fabricating. All the weavers that were interviewed for this research are masterweavers; this means that they all had (dependent) weavers working for them. This notwithstanding, in order to complete a large request for fabric within a stipulated timeframe, production has to be split with other weavers. This arrangement requires coordination and monitoring from the masterweaver that owns the order and a variety of mechanisms are employed to achieve this (including using other masterweavers that are located at close geographic proximity, and/or appointing a coordinator at each outsourced production site). However the cost of outsourcing is cheaper than the cost of disappointing the customer by not meeting the agreed delivery date and/or not producing the expected quality of fabric. This therefore makes outsourcing partnerships the least cost alternative.

This research therefore found data supporting the second part of the first supposition, which is that 'Structure is a means of dealing with [the] instability [created by information imperfections]'. Evidence was also found to support the supposition that "Economic entities tend to always adopt the least cost structure [and/or mechanism] of conducting trade".

Chapter 8 Research Findings – Telephone Use

1 Introduction

The previous chapter (Chapter 7) identified the information imperfections that exist in the *Aso Oke* industry. The consequences of these imperfections, the response of the industry in minimising such consequences and promoting an environment for trade, as well as the way in which these responses translate into organised structures of trade were discussed. The prior chapter has therefore set the context for presenting the findings of the research that relate to the final two suppositions of this study. These are that:

1. Telecommunications is a tool that is utilised in the reduction of information cost [and will as such be adopted by surviving/ dominant structures].
2. Geography has an impact on trade and telecommunications is a tool by which this impact can be managed

This chapter presents the findings of the research that deal specifically with telephones, what they are used for and how they are used, and how this use impacts the industry. So whilst Chapter 7 established an understanding of the requirements for information in the industry, this section documents the way in which telephones are used in meeting these requirements.

2 The Use of Telephones in the *Aso Oke* Industry

2.1 Access to Telephones in the *Aso Oke* Industry

The focus of this research is on telephones and not on the broad range of applications that constitute telecommunication technologies. This section therefore describes the different ways in which interviewees gain access to telephones. Three types of access were identified:

2.1.1 Private ownership of a telephone is provided by a business partner
Two examples of this form of ownership were found during the field study. In the first instance the intermediary operated a vertically integrated operation in which weavers are 'recruited' to work exclusively for her. This intermediary provided a mobile telephone handset complete with a Subscriber Identification Module (SIM) card. This handset was given to the masterweaver of the group and it was the weavers' responsibility to purchase credit/air time for the phone⁷⁶.

In the second instance of this type of access, the intermediary sells a mobile phone handset (with or without a SIM card) to the weaver via a deferred payment system. This depends on the benevolence of the intermediary and the nature of relationship between the intermediary and weaver. Here the weaver accepts to pay for the phone over a period of time and (in the example observed during the field study) via deductions from payment owed for completed orders. The intermediary dictates the price of the handset and SIM card and although the amount deducted at each payment can be negotiated with the weaver, the intermediary performs the deduction prior to making payments for completed orders. Both parties to the transaction keep a record of how much has been paid and what the remaining balance is. Although there is the possibility that the weaver might end up paying more than the real cost of the telephone handset and SIM card this arrangement does have some benefits. In addition to obtaining private access to a telephone, the weaver also secures future orders from the intermediary. However, this approach increases the power and control the intermediary has in the trade relationship.

⁷⁶ Specific to this example, this intermediary recruited weavers on revolving yearly contracts, at the end of each year the recruits would go on 'vacation' and the handset (with SIM card) would be returned to the intermediary. Should the weavers return (or be allowed to return) for a new contract, or in the event that a new group of weavers are recruited, the handset and SIM card would again be given to the masterweaver.

2.1.2 Access to a telephone is via a non-commercial third-party

Individuals in the industry may also have access to telephones through family and friends or neighbours. Under these circumstances access is obtained at no cost and relates predominantly to incoming calls. One of the weavers interviewed made use of her son's mobile phone but as he stays away from the family there was usually a delay in getting messages left for her. In another example, a weaver makes use of his neighbour's telephone. People calling the weaver either leave a message or call back after a certain time interval whilst the weaver is summoned to receive the call. The weaver can also make use of this telephone for urgent out-going calls.

2.1.3 Access to a telephone is via a commercial third-party

Weavers who do not have access to a neighbour's telephone and cannot afford to own a telephone make use of telecentres. The NTCA (2000) uses the term "telecentre" to describe a range of organisations that make information and communication services publicly available to low-income populations. Depending on ownership and the range of services offered, the NTCA categorises telecentres into (i) basic telecentres - offering a variety of services such as telephony, fax, computing, internet, photocopying, and related technologies; (ii) multi-purpose community telecentres - which in addition to the offerings of basic telecentres also provide higher-end technologies, engage in training and focus on specialized services. Other categories are (iii) phone shops that provide only telephony services⁷⁷ and (iv) cyber cafés which are commercial enterprises that provide computer and internet access.

⁷⁷These phone shops (also known as "public call offices") essentially comprise of just a telephone and fax. However some also have personal computers, internet access and other peripherals (Dymond and Oestmann 2001).

What were referred to as 'telecentres' by interviewees, do not fall into any of the NTCA categories. Rather these commercial third-party access points are better described as "phone shops", and include "umbrella people"-individuals that provide telephone access by reselling airtime:

"They don't need to rent shops, and in most cases, permission to use the public space is unnecessary (or at least not sought). All they need is an umbrella, a plastic table and some chairs - and, of course, a Subscriber Identification Module (SIM) card and handset - and they are ready for business." (Dymond and Oestmann in ITU 2003:55)

This form of access was the most commonly cited type encountered during the case study. Even when participants had access to other forms of telephone service (e.g. through family and friends) they still made use of phone shops. The cost of making a phone call at these shops is equal to the advertised tariff of the operator the phone shop subscribes to. However, users must also pay a one-time 'registration' fee if they also want to receive calls at these shops. The charge for registration is a token fee that according to interviewees posed no significant barrier to trade. Once this fee is paid the common practice is that the weaver is given the telephone numbers of the shop which can then be passed onto intermediaries/buyers and other contacts. When a call comes in for the weaver, the caller's message is noted down in a book. Either an employee of the phone shop brings the message to the weaver's workshop, or the weaver goes periodically to the shop to check for messages. Callers can also request for the weaver to be summoned to receive calls; in this case the caller is asked to telephone back after a few minutes whilst a message is sent to the weaver to come to the shop to receive the call.

2.2 Telephone Use at Different Stages of Order-Fulfilment

2.2.1 Sourcing for orders and informing weavers of orders

When a buyer indicates a willingness to place an order, the response time of the intermediary/weaver to the buyer's requests is made faster through the use of telephones. In the first instance telephones are used to inform participants of orders. There is however a caveat to this use of the telephone which is that it is used in contacting participants that are already known to each other. In other words, as shown in the following narration, participants are already in established trading relationships:

Intermediaries phone [weavers] when an order is received and [weavers] also keep in touch by telephone to see if orders are available.

Prior to the use of telephones, information about orders was obtained through physical movement from one geographic location to another. The intermediary either travelled to where weavers are located to give details of the order, or a representative of the intermediary was sent to inform weavers that an order was available. The weavers would then travel to the intermediary's location to receive details of the order⁷⁸:

In the past, when there was an order to be fulfilled, [this intermediary] would send someone to go and call [her] weavers to come and that they would come from where ever it was that they were ...

With telephones, whilst weavers still have to come to the buyers/intermediaries location to receive details of the order, notifying them of the work opportunity is much faster and using telephones for this purpose

⁷⁸ This approach is usually used when the weavers are located at a significant distance (e.g. in a different State) from the intermediary and the weaver's travel expenses are usually reimbursed. The approach is adopted as a response to the risk to personal safety due to the precarious nature of long distance (particularly inter-State) travel in Nigeria

is increasingly the preferred choice. Weavers who do not have access to phones loose out on orders:

[This weaver] believes [telephones are] a good way of “spreading word to customers” and shared that in the past he has lost orders because he did not have a phone. In this instance, he arrived on a cold call at an intermediary’s place only to learn that an order had just been given out to another weaver with a phone who was called as soon as the order arrived.

Furthermore, to emphasise the importance of time in mobilizing resources for an order, there is preference for mobile telephones above fixed lines. First of all some weaving locations are rural or sub-urban and not all are covered by fixed network operators:

Mobile communications is emphasised and preferred to fixed lines due to the “rural” location of “sites” and the fact that they are dispersed [there might be no reliable fixed line infrastructure available at such locations].

Secondly, because personal ownership of phones is low amongst weavers the manner in which access is obtained to telephones gives mobile technology an advantage:

[The weaver] makes use of a local telecentre; this centre has three phones, two fixed lines and one mobile line. Callers on the fixed line are either asked to leave a message for her [the weaver], or told to call back in a few minutes whilst an employee of the telecentre comes to her shop to inform her of the incoming call. Calls on the mobile number are brought to her shop.

When a buyer/intermediary calls a weaver on a mobile phone there is a higher probability that s/he will get to speak to the weaver faster than if the call was placed to a fixed line number. Again this increases the speed of response of the weaver and because intermediaries/buyers speak directly to the weaver, mobile phones minimises the possibility that incorrect or incomplete information is being communicated:

...with respect to calling weavers, mobile telecom is preferred by [the intermediary] to a fixed line. This is because there is limited guarantee that a message left in the absence of a weaver will in fact be delivered or acknowledged as being delivered.

2.2.2 Communicating approval of/changes to samples of fabric

Once an order has been allocated to a weaver and the design details have been communicated⁷⁹, the weaver produces a sample of the design. This sample is shown to the buyer who then makes a decision as to whether to proceed with the order or make changes to the sample. Whatever the decision, the information can be received by the intermediary/weaver via a telephone:

With a telephone [in particular a mobile phone] the intermediary can receive approval for an order at the weaver's workshop and negotiate changes in design whilst she is there allowing for faster production of samples and orders.

2.2.3 Searching for/acquiring raw materials

The common practice when looking for a specific colour of thread is to physically search for it, first amongst thread dealers within the town or city the purchaser (intermediary or weaver) resides in. If the thread is not available locally, the (physical) search is extended to known wholesale markets or centres. These centres may be other towns/cities or specialised cloth markets. However, if there is a relationship between the purchaser and the thread dealer, the search can be made more efficient through the use of a telephone. The following section from an interview illustrates this:

[The intermediary] plays an active role in [the procurement of raw materials], particularly when it comes to buying the thread to be used for weaving. [The intermediary] maintains good relationships with thread sellers [those at Dosumu market and also a trader at Otta were mentioned]. This good relationship, built over a period of frequent repeat purchases, extends to the availability of [an ad-hoc] credit facility. At times one of the ladies employed at [the intermediary's]

⁷⁹ In all circumstances encountered by this research this communication occurred face-to-face

shop goes to pick up the required quantity, type and colour of thread. With respect to the thread trader at Otta, weavers with workshops in that area have on occasion been sent to her to pick up thread. Payment for such purchases is made at the earliest opportunity. Under such circumstances, [the intermediary] would call the thread seller to request for such transactions. Likewise, to ensure authenticity, the thread seller would call [the intermediary when the employee/weaver arrives] to confirm the trade. When a particular type or colour of thread is unavailable, the thread seller will often obtain it from, or recommend an alternative seller.

Weavers also maintain relationships with thread sellers (although none of those interviewed for this research had access to a credit facility):

[The weaver] buys from/deals mainly with three [thread sellers] but will expand his search if a particular shade of thread is hard to come by. Just one of these three [thread sellers] has a telephone ...Her shop is located in Ajah, which is close to his workshop.

Intermediaries and weavers can cut down on the amount of time spent searching for thread by telephoning thread sellers with the specification of the required thread before paying a visit to the shop. If the trader does not have the required shade, he/she can utilise his/her network in tracking it down. In addition established thread sellers have access to manufacturers and can therefore order a hard to come by colour direct from the manufacturer. If a particular colour is no longer being produced, the thread seller can quickly communicate this to the intermediary/weaver and recommend an alternative (similar) colour. Furthermore, if the thread seller does not have the required thread in stock, or does not have it in sufficient quantities a date in which the thread will become available can be communicated to the intermediary/weaver. This allows both the thread seller and intermediary/weaver to better plan their activities and inventory.

From the perspective of the intermediary, the credit facility provided by thread sellers when coupled with authentication via telephone calls, is also a

very useful initiative in speeding up the order fulfilment process (whilst also distributing financial risks). As illustrated in an earlier quote, not only can the search and 'purchase' of thread be delegated or shared amongst various employees, there is also the option of weavers located a short geographic distance to the shop of a thread seller acquiring thread for an order as soon as they have been telephoned of the approval of a sample - i.e. without the intermediary having to immediately travel to their location with the required raw materials or money for its purchase. This again shortens the time in which it takes to complete an order.

2.2.4 Requesting a change in the colour (shade) of thread

Data from interviewees show that when the customer initiates such changes it is much faster to provide a response to their request when telephones are available:

When changes/alterations are made by the buyer, the weaver is contacted [via telephone or physical movement] to again come to the business premises for the amendments. Thus with telecommunications, [the intermediary] can communicate changes quickly and the probability of being able to effect changes is increased. This leads to improvement in customer service and minimises the costs to the business due to wastage. [These benefits were further explained:] without telecom physical movement is required to confirm the stage of fabrication the weavers are at and if required changes are possible.

The telephone is therefore a communication tool that facilitates increase responsiveness to client demands. When changes are initiated by the weaver or intermediary, it is faster to inform the trade partner of the situation and alternatives using the telephone, a decision or solution can then be quickly taken or implemented. For example:

When asked how she communicates changes or receives communication of changes to orders, [the weaver] said that there is either physical movement by her or the buyer/intermediary, or that she makes use of the telephone.

[Another weaver stated that] Prior to the completion date; [she] is able to notify the buyer/intermediary of any changes using the phones at the telecentre. The buyer/intermediary also informs her of changes by the same method. According to her, this process minimises faults on on-going work.

Telephones therefore improve the responsiveness of intermediaries and weavers and increase the efficiency of the order fulfilment process.

2.2.5 Obtaining feedback on progress

The telephone is also used by intermediaries to obtain information on the progress of an order without physically travelling to the weaving location:

Progress is communicated via the use of the telephone; the weaver getting in touch if/when issues arise, and [the intermediary] to find out about the status of the order.

In particular (and because an order for *aso oke* is completed in batches) the telephone is used by intermediaries to check (with the weaver) when a batch of fabric is ready for collection. Telephones are in turn also used by intermediaries to inform buyers that batches are ready for collection:

... when [the intermediary] thinks her order is ready to collect [either in part or in full] she would call requesting to know if her order can be delivered and the weavers will bring the order to her.

As soon as the order is ready [the intermediary] calls the customer to inform them. [In one example] The intermediary phoned [the buyer's aunt] when the initial order batch was ready for collection, and the message was relayed to [the buyer] who then came to pick up the batch.

As previously mentioned in the prior chapter (see section 4.3 in Chapter 7), when there are large orders of fabric to be produced, weavers will outsource part of the production to other weavers they trust. Under certain circumstances outsourcing means the weavers take orders back to the weaving communities they originally come from. This is the case when the

design pattern proves too technical, or when weavers merely want to contribute to the employment opportunities in their home communities. In such circumstances telephones are invaluable as tools for communicating progress and instructions. In one instance the weaver mentioned that such an order was:

... handed over to one person that acts as a co-ordinator. [This weaver] mentioned that this was the best arrangement, as she will return to Lagos to complete the half of the order being carried out there. She therefore needs just one point of contact in finding out the status of the order and communicating changes. She keeps in touch with the coordinator by telephone [her calls are received at a local telecentre].

The role of telephones in monitoring progress and communicating instructions should however be put in context. Due to the high level of distrust in the industry, most activities that occur during the production of orders involve monitoring and controlling the behaviour of trade partners. Although telephones play a role in such activities by facilitating the exchange of information, physical movement in the form of visits to the location of the trade partner in order to visually verify the status of production is the norm. Such movements are particularly frequent in relationships between (independent) partners. Here, telephone use is a supplement to (and not a substitute of) physical verification:

[An intermediary stated that] The horizontal loom weavers she uses are located very close to her house. With these weavers, after the start of an order, she usually goes to their workshop to monitor them; she does this because she does not want to "disappoint" her customers, as weavers "never say no!"

[Yet another intermediary noted that] 1 to 2 days before the time of completion [of the order] given by the weaver, a visit is usually paid [by the intermediary/buyer] to the workshop to verify progress; completed orders are collected with the remainder being delivered by the weaver.

2.3 Implications of Telephone Use on the Organisation of Trade

How telephone use facilitates the responses of the *Aso Oke* industry to the uncertainties highlighted in sections 2 and 3 of Chapter 7 is summarised in Table 16. This sub-section discusses the changes telephone use has had on the way in which trade is organised in the industry.

The prior sub-section (section 4.3) discussed how the use of telephones improves the way in which orders are allocated to weavers, and the way in which raw materials are sourced in the industry. Resources in the form of time and money that is spent as travel expenses can therefore be better managed by the weaver through the use of the telephone. Likewise, prior to the use of telephones, intermediaries who had an order to fulfil would have to travel to the location of weavers at risk to their personal safety. No surprise then that according to one of the intermediaries interviewed: "GSM gives me rest of mind":

[Intermediary speaking] ... having a telephone ... makes the process of getting orders faster and also makes life easier in terms of movement.

However, physical movement still has to take place. The design patterns to be replicated on the fabric and other specifications of the order have to be communicated to the weaver face-to-face. Also, the sample of the ordered fabric has to be delivered and inspected by the intermediary/buyer once it has been produced. Furthermore, raw materials also have to be sourced and purchased. The need to travel is therefore not eliminated by the presence of telephones but is instead largely reduced to essential movements that have more predictable outcomes⁸⁰.

⁸⁰ There is uncertainty on the side of the intermediary as well as the weaver; intermediaries may not have any orders on the day weavers travel to see them, and weavers may not be able to accept new orders when the intermediary approaches them.

Telephone use also contributes towards the spreading of risks. Firstly, intermediaries no longer have to travel to allocate orders but rather telephone to see which weaver is able to accept orders (and come to collect the order request). The risk to personal safety (associated with travelling) has therefore been largely transferred from intermediaries to weavers.

Secondly, telephones help to spread an intermediary's financial exposure. Whilst relationships between intermediaries and thread sellers existed prior to the advent of telephone use, the risks of operating a credit facility when both parties are not physically present at the point of transaction were high⁸¹ and even now, most thread sellers operate on a cash-and-carry basis. With the availability of telephones confirmation of a request for credit can be obtained (in most cases) instantaneously - especially where mobile telephones are present (due to their added advantage of mobility).

None of the weavers interviewed reported having a credit facility with the thread sellers they patronised. However, both weavers and intermediaries could rely on the networks of these sellers to obtain a hard to come by shade of thread. With telephones, information about availability of thread can be more easily conveyed which can lead to better planning and management of time and activities by all participants in the industry.

⁸¹ Some intermediaries would send notes to thread sellers approving an employee or weaver to collect thread on their behalf but these could easily have been forged

Table 16: Summary of responses to uncertainties in Aso Oke industry and the way telephones facilitate these responses

	UNCERTAINTY	RESPONSE	TELEPHONE USE
1	<p>Uncertainty about new orders</p>	<p>Development of reputational capital Migration to areas with concentrated demand</p>	<p>Facilitates the gathering of information about orders. Weavers telephone intermediaries to find out if there are any pending orders. Facilitates allocation of orders. Weavers are telephoned when an order arrives. Contributes towards the reduction of transportation cost as weavers can telephone to prospect for orders rather than physically travel to meet intermediaries Reduction in opportunity cost that arises from travelling in search of orders Improves business efficiency as journeys are reduced to those with more predictable outcomes Reduces communication costs as intermediaries can telephone to inform weavers of available orders rather than travel to do so</p>
2	<p>Lack of knowledge about the product and transaction process</p>	<p>Building awareness of capabilities of suppliers and the way trade is conducted in the industry Provision of product and transaction guarantees Holding of finished goods inventory</p>	<p>Facilitates increase in knowledge of capabilities as reduction in communication cost means that larger number of industry participants can keep in contact with each other Above aids confidence in providing guarantees</p>

	UNCERTAINTY	RESPONSE	TELEPHONE USE
3	<p>Uncertainty about the availability of raw materials</p>	<p>Holding of raw materials inventory</p> <p>Coordination of search strategy - including building of trust-based relationship with thread dealers</p> <p>Generating alternatives when required shade of tread is not available in the</p>	<p>Facilitates spreading of financial risk in credit transactions between intermediaries and thread dealers. Telephones are used to validate the authenticity of transactions.</p> <p>Expands the geographic scope of search for thread by facilitating communication between members of thread dealers' network.</p> <p>Facilitates faster order fulfilment by reducing the time taken to either find and procure required thread or (when thread is not available) come up with alternatives</p>
4	<p>Uncertainty about the behaviour of trade partner - that one party to the trade will change their behaviour to the detriment of the other party once a transaction has been agreed upon</p>	<p>Increased supervision and monitoring</p> <p>Define trade agreement</p> <p>Hold inventory of finished product</p> <p>Develop close, durable relationships based on trust and 'reputational capital', and/or systems of monitoring behaviour that are backed up by sanction</p> <p>Adopt integrated organisational structures</p>	<p>Improved accessibility via reduction in communication costs facilitates strengthening of intermediary - weaver networks</p> <p>Improves flexibility of partnerships and outsourcing relationships</p> <p>Can constitute entry barrier to industry, especially for weavers as access to telephone becomes one of intermediaries' selection criteria</p>

2.3.1 Type of access to telephones and implications on organisational structure: Networks

With respect to organisational forms, the use of telephones modifies or strengthens relationships between industry participants and impacts the way transactions occur between them. From the results, a network organisation is seen emerging with telephones as critical links between participants. In such networks, intermediaries (not wishing to physically travel from location to location at risk to their personal safety) increasingly deal with weavers they can access via telephones and strengthen ties with thread weavers who have invested in telephones, and who are willing to perform credit transactions (via third-parties) using the telephone as a means of authenticating requests. Weavers with access to telephones can stay in contact with a larger number of intermediaries than those without and who have to physically travel to stay in touch with intermediaries/buyers or conversely, wait for them to physically visit them. Weavers with telephone access therefore have access to potentially more orders than those without.

As most weavers do not own a telephone, they instead make use of telephone facilities at phone shops. In addition to this, some weavers also align themselves with a representative weaver who has a telephone and who coordinates the collection of orders from different intermediaries. Such arrangements add a different dimension to the network organisation and (from the interviews) appear to be particularly common amongst vertical loom weavers as highlighted by one such weaver from the Kogi State:

[Weaver speaking] Orders are also sourced through the network of weavers from Kogi; because they all tend to know [of] each other, information of who has work and who is looking for work passes around. Thus orders are distributed amongst network members

The relationships described so far can be represented by Figure 53. Links between participants that do not have access to telephones are represented by lines of a lighter shade (communication between these parties is accomplished by physical movement between locations). Dotted lines (also of a lighter shade) represent indirect links via a third-party; in the diagram these represent the link between a weaver and a thread seller on referral by an intermediary.

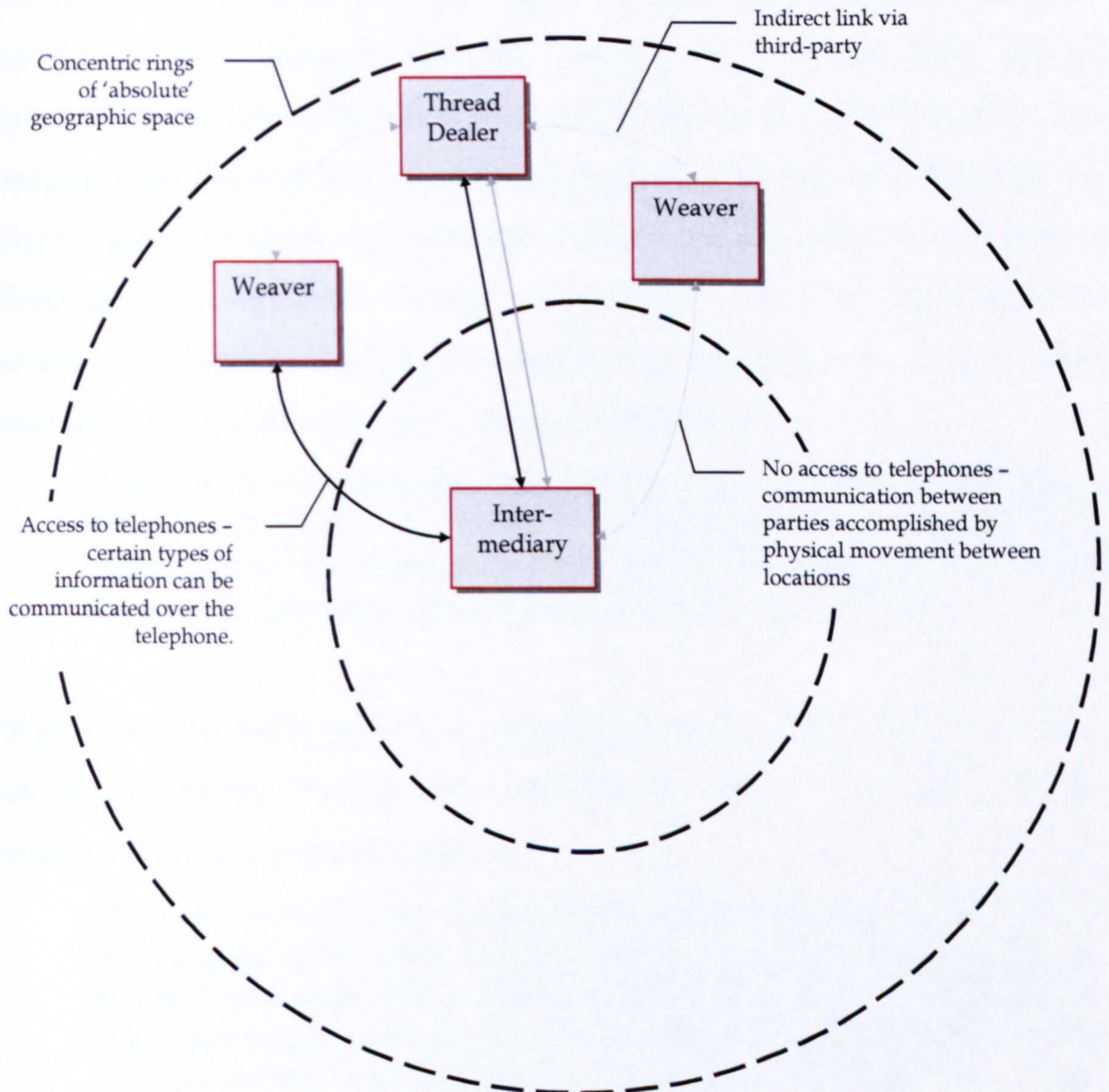


Figure 53: Networks in the *Aso Oke* industry

When telephones are used (solid lines) the weaver is contacted to go directly to the thread seller to pick up the thread. In the absence of telephones, movement must first occur either by the weaver or intermediary to notify the

weaver of the arrangement with the thread seller. The weaver then approaches the thread seller with proof (e.g. a note) of being sent by the intermediary. In both cases, the thread seller authenticates the weaver's identity and sale transaction with the intermediary via the use of the telephone.

2.3.2 Type of access to telephones and implications on organisation: Integration

Another point worth noting with respect to the observed networks in the industry is that weavers that are referred to a thread seller by an intermediary work predominantly or exclusively for that intermediary. The research data showed that (in general) the level of integration between the intermediary's business and weavers reflects the level of the intermediary's (financial) risk/exposure. Where weavers are part of an intermediary's business the level of risk taken is higher, for example with respect to an intermediary that refers her weavers to thread sellers:

[The intermediary's] initial weavers were those that her mother used and are from Iseyin. A "family"-type relationship is maintained with such weavers; for example, the child of one such weaver was brought to Lagos by [the intermediary] and currently weaves for her.

Higher financial risks, in terms of money being given directly to weavers to use in purchasing thread, was exhibited by another intermediary who employs weavers on yearly contracts:

The weavers work only for [the intermediary] although they at times sell remnants of samples or orders [these are usually in strips that can be made into male caps]. They are not paid a salary but "per piece". [The Intermediary] however pays for the raw materials, although the weavers are the ones that buy the thread for weaving as this reduces the amount of work she has to do.

In a third instance, the intermediary referred to the location of her weavers as "site" (similar to the term 'project site'):

[*Intermediary speaking*] Once an order has been placed, weavers at "site" are contacted to come for the orders via a telephone call.

These weavers work exclusively for the intermediary who purchases all the raw materials required for orders by herself (maintaining trading relationships with manufacturers located outside the country):

... The telephone is used to search for raw materials and at times calls are made to factories in Asia when looking for a specific shade of thread.

In this case, when weavers come to pick up the order specifications, they are also given the required raw materials. The buying of raw materials by the intermediary for onward distribution to weavers is a tactic also employed by intermediaries who use independent weavers. However in the former case, purchase of raw materials is solely to ensure the quality of the raw material and final product rather than the as a result of trust issues with weavers.

Having confidence in and/or being able to control the weavers working on an order through 'ownership' of weavers or of the activities they are performing not only coincides with the intermediary taking a higher level of risk but also with the type of access participants have to telephones. In all the cases of integrated businesses mentioned above, the weavers had private (or individual) ownership of telephones, and the research confirmed that in two cases, this ownership was provided by the intermediary the weaver worked for:

[One Intermediary] telephones [the weavers] on the mobile phone she gave to the masterweaver of the group [the weavers are responsible for "topping up" the phone] ... [the] weavers always go home in December, but would come back if they were invited to. [The Intermediary] takes back the mobile phone given to [the weavers] when they leave in December.

[Another Intermediary] has in the past procured (second-hand) mobile phone handsets and SIM cards for three of her weavers. The cost was deducted over a period of time from payments due to them for work done.

The ordering of this interrelationship between organisational form and telephone access however needs to be clarified. Rather than the type of access leading to the development of integrated structures, it is the existence of an integrated structure that influences the type of access to telephones. This direction of influence is developed further in the following section.

2.4 Geography and observed organisational forms

The network organisations that were seen emerging in the industry were introduced in the previous sub-section (2.3). It was observed that where vertical integration of processes whereby one participant (usually the intermediary) 'owned' the activities of another (usually weavers), the level of risk the 'owner' was prepared to take with regards to the relationship was higher than when both parties are independent entities engaged in a transaction.

Three examples of vertically integrated organisations were observed in the data and the physical location of the intermediary vis-à-vis their weavers illustrate an interesting pattern. In the first example, the intermediary used the terminology 'sites' to refer to where her weavers were located. These sites were observed to be on the outskirts of the State in which the intermediary lives and are a substantial⁸² distance from her premises. The weavers are located in an area called Idi Iroko (in Ogun State), which is on the border between Nigeria and Benin Republic (see blue arrow in Figure 54).

In the second example, the weavers are again located on the outskirts of the State though not as far as the indigenous weaving communities:

Over a period of time, and principally as a result of a greater degree of convenience, Ghanaian weavers tend to be used more than Nigerian

⁸² Although substantial this distance may not be considered significant when compared to that of indigenous weaving areas.

weavers. Not only are they located on the outskirts of Lagos as opposed to distant rural/urban centres.

It is the intermediary in this example that mentioned having a relationship with a thread seller in Otta (an area on the border between Lagos and Ogun State - see green arrow Figure 54) to whom she at times refers her weavers (that are located in the same area).



Figure 54: Map showing location of Idi Iroko and Otta relative to location of intermediaries

Source: www.multimap.com

Note: Places have been highlighted to aid in visualising distance. Weavers located at Idi Iroko (blue arrow) work for an intermediary located in Ikeja (blue circle); whilst those located at Otta (green arrow) weave for an intermediary located near Ebute Metta.

Scale = 1:1,000,000 

The third example was of the intermediary (located in Ibadan, Oyo State) who employs weavers on yearly contracts. She houses her weavers in a bungalow not too far from her shop/premises. This is also where the weavers work. The close proximity of the weavers' location is associated with the need to monitor them; the intermediary also providing security (in

the form of a guard) for the premises so as to “keep track of their (the weavers’) visitors”.

A lot more variation was observed with respect to intermediaries who did not have (vertically) integrated businesses. In some cases the weavers orders were given to are located on the outskirts of the State where the intermediary resides and their travel expenses reimburse by the intermediary. In other cases, intermediaries preferred to use weavers that were located very close to where they resided or had their shops.

In general, the weaker the level or type of integration between intermediaries and weavers that was observed, the greater was the use of physical verification as a monitoring mechanism, and the closer the preferred geographic distance between the intermediary and his/her weavers. This relationship between geographic proximity and monitoring is perhaps exemplified in its pure form by a fashion designer who makes extensive use of *aso oke* in her designs:

[According to the designer] ... without incorporating her ideas and demands, the *aso oke* obtained from intermediaries and weavers is “thick” and inappropriate for garment design ... Her input into the fabrication process is thus extensive; she describes and insists on the design patterns to be produced, the width of fabric required and the consistency of the fabric. She has to monitor the process closely, sitting with the weaver to ensure that the desired result is obtained.

Thus irrespective of the availability and use of telephones, physical verification of progress on orders is still the norm in this industry.

2.4.1 Impact of distance on buyers

This impact of geography is also exhibited in the selection of intermediaries by buyers; one buyer began the process of selecting an intermediary by looking at those located:

... in Ibadan where she had grown up and where her family lives. This however proved difficult because she had to do the running

around in Ibadan but lived and worked in Lagos ... [the search was moved] to Lagos, which was considered to be more convenient for her.

Likewise, when intermediaries have a buyer that is in a different geographic location to them; a representative is usually appointed:

[Intermediary speaking] For national [i.e. orders outside Lagos] and international orders, the buyer requires someone to act on their behalf, with responsibilities for paying the deposit and final bill and collection of the finished fabric⁸³.

2.4.2 Impact of distance on outsourcing

Furthermore, weavers that outsource part of the production of large orders will either in the first instance look to recruit other weavers in the same geographic location:

At times orders/order batches are also taken to Illorin for fabrication, although the first preference is Ijebu and environs this is because the time required [it is about 4 hours to Illorin] and transportation costs have to be considered.

Some masterweavers even prefer to recruit (dependant) weavers to work at their workshop just for the duration of the order; for example one of the weavers interviewed:

...currently has 8 weavers working with him ... Some of the weavers that used to work for him have set up their own weaving businesses, others have gone back to Ghana ... weavers that have returned to Ghana are however only a phone call away. Should a large order be obtained they can be called to come to Lagos and arrive within 24 hours.

There are however instances in which outsourced orders have to be taken to the weaver's originating community. In such instances a coordinator is appointed to take responsibility for the part-order being produced in that location whilst the weaver returns to their work location to supervise the

⁸³ Whilst this is the preferred arrangement, intermediaries will also deal with customers who pay for orders through the banking system and who are willing to receive finished products sent through commercial transport operators.

batches being produced there. Thus even under this arrangement, a coordinator that is local (in geographical terms) to the site of production is appointed to monitor progress (see "Outsourced Structure" in Figure 55).

This preference for geographic proximity in relation to network organisational forms is represented in the diagram above (Figure 55). The dotted circles surrounding the representation of different participants in the industry signify distinct geographic locations (three regions are presented in this diagram).

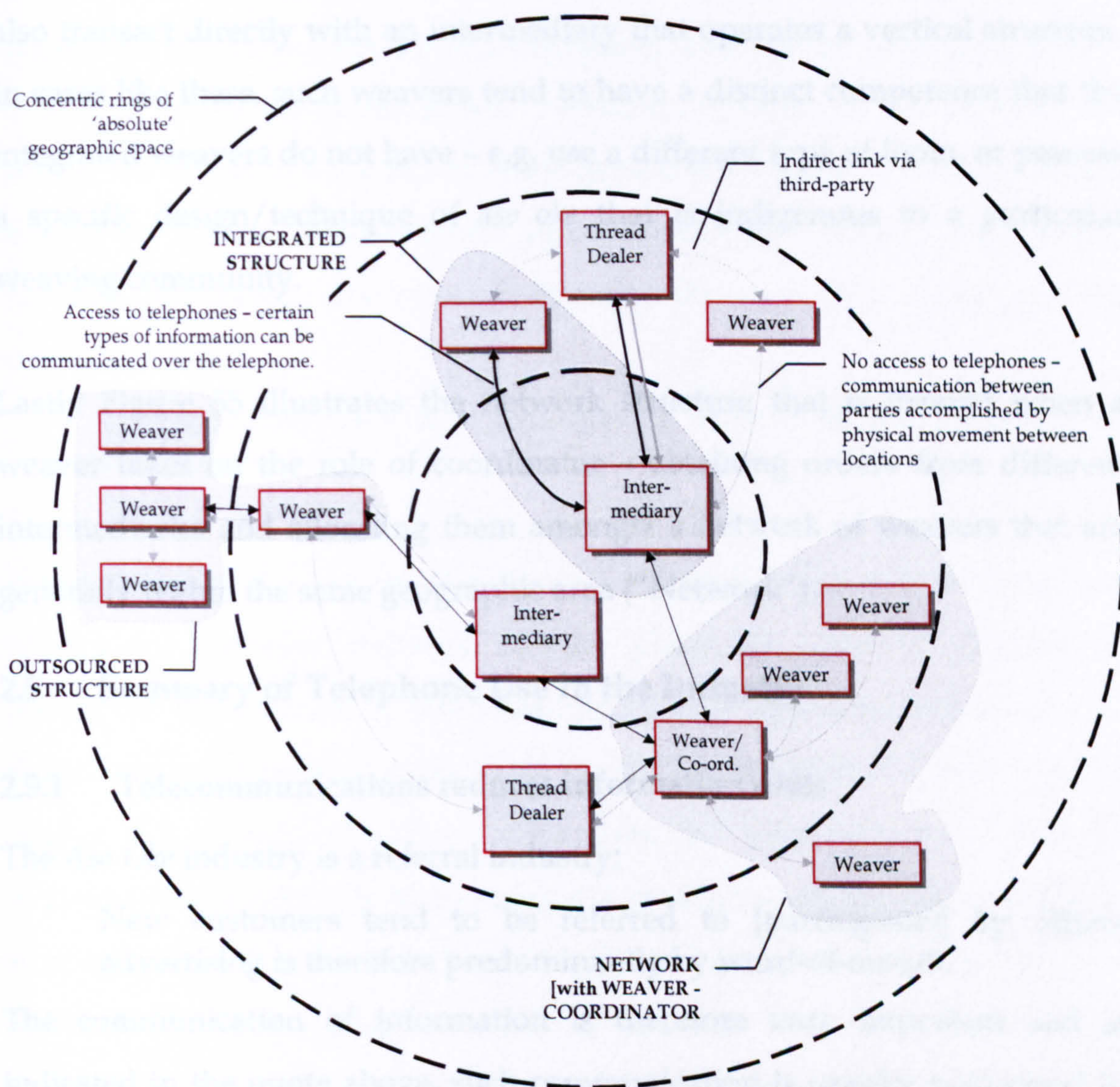


Figure 55: Organising structures in the *Aso Oke* industry - illustrating geographic boundaries

Two intermediaries are represented at the centre of the diagram. One intermediary operates a vertically integrated firm and Figure 55 visually illustrates that this intermediary can have weavers located on the outskirts of his/her geographic location (“Integrated Structure”).

Intermediaries can also transact with weavers outside their geographic area and who may in turn outsource part of the order (“Outsourced Structure”). In such instances the coordination of weaving is delegated to a specific person who is resident in that location. Weavers located in a different region may also transact directly with an intermediary that operates a vertical structure. In cases like these, such weavers tend to have a distinct competence that the integrated weavers do not have – e.g. use a different type of loom, or possess a specific design/technique of *aso oke* that is indigenous to a particular weaving community.

Lastly Figure 55 illustrates the network structure that is formed when a weaver takes on the role of coordinator – obtaining orders from different intermediaries and allocating them amongst a network of weavers that are generally within the same geographic area (“Network”).

2.5 Summary of Telephone Use in the Industry

2.5.1 Telecommunications reduces information costs

The *Aso Oke* industry is a referral industry:

New customers tend to be referred to [participants] by others, advertising is therefore predominantly by word-of-mouth.

The communication of information is therefore very important and as indicated in the quote above, such communication is usually performed by “word-of-mouth”. This makes the use of the telephone potentially relevant in the industry as telephones provide the means to verbally communicate information at speed and without the limitation of geographic distance.

Referral is however relevant to a specific part of the transaction process - the start of the process when participants are deciding who to enter into a trade agreement with.

Given that the alternative to telecom use is physical movement by [the intermediary], it is considered to be a less expensive alternative to the transport costs that would have been otherwise incurred [i.e. cost of taxis] - this was exemplified [during the interview by] comparing the GSM call rate of N50 per minute as being cheaper than a taxi charge of [on average] 1,000Naira.

In the above quote (by an intermediary) "cost" is financially evaluated in terms of tariff and not in terms of access. Cost of access depends on type of access, and private ownership of a telephone, costs (financially) significantly more than access via phone shops. However, in terms of lost revenue not having any access to a telephone is the most costly option. From the results of the interviewees, all participants agreed that using a telephone is cheaper than needless travel. The research therefore finds evidence to support the supposition that

Telecommunications is a tool that is utilised in the reduction of information cost.

Effectiveness of the use of telephones in reducing the cost of acquiring information however depends on the phase or stage of transaction. Telephones were shown by this research to play a significant role at the start of the transaction process particularly during the selection of a trade partner. During this phase, telephones were used by intermediaries to inform weavers of the availability of an order and to summon them to their premises to receive the order details (without the intermediary having to travel to the weaver's location). Telephones also play a role towards the end of the transaction process in notifying partners of the collection of finished products. In between these two stages of the ordering process, telephones are used in communicating changes and informing trade partners of issues arising during the production of the fabric. Telephones are also used as a

supplement to finding out information on status of the fabrication process, and in setting up appointments to visit trade partners during any of the stages of production.

However, due to low levels of trust that exist within the industry, physical verification of the status of an order is still very much the norm in the industry. The telephone is not regarded as being effective in gathering this type of information. As stated by one of the intermediaries interviewed:

Even with the use of telecoms, visits are still made to the weaving workshops

Telephones are also not as effective in gathering private information about capabilities and behaviour of participants, these have to be observed.

There are therefore conditions that need to be met prior to telephones being of advantage in this industry. Firstly the participant's reputation in the industry will get them recommended in the first place, and associated with this is the proven capabilities of the participant, primarily in the form of past transactions. Secondly, the extent to which the participants engaged in trade trust one another will determine the extent to which they will be satisfied in communicating and discussing details and progress over the telephone and without physically verifying that what has been said is indeed true. According to one intermediary these conditions can be summarised as:

"Who you are" in the industry and related to this, whether or not there already exists trust between you and the person you are dealing with, and lastly "what you can produce" an indication of the quality of your output. If these things are present then having a telephone results in faster order production. It makes the process of getting orders faster and also makes life easier in terms of movement.

2.5.2 Geography's impact on trade and the role of telecommunications

Geography impacts trade in at least two dimensions; transportation and communication. The further geographically apart trade partners are, the more expensive it is for them to traverse the distance between them. That "Telecommunications is a tool through which the impact of geography can be managed" has been discussed in the preceding sub-section (2.5.1). The research data has shown that telephones help to manage the impact of physical distance on communication by allowing for the exchange of information without direct face-to-face contact. This in turn enables participants in the industry to reduce their communication costs.

With respect to transportation, the impact of geography is felt on all activities that require face-to-face interaction. These include:

- a. Briefing and negotiating the characteristics of an order – this occurs either between the customer and intermediary or between the buyer (customer or intermediary) and the weaver. Characteristics of an order however go beyond the design of the cloth and include the price, deposit to be paid, as well as delivery dates.
- b. Changes and amendments to the design of the fabric also tend to be communicated face-to-face:

When changes/alterations are made by the buyer/intermediary, the weaver is contacted [via telephone or physical movement] to again come to the business premises for the amendments.

- c. Obtaining raw materials also involves face-to-face contact, particularly as colour is such an important characteristic of the order. The specific colour (shade) of thread is therefore verified and checked prior to bulk purchase.
- d. The collection of finished products also requires face-to-face contact, especially as balance of monies owed are usually collected at this point.

Physical movement however incurs more than just financial costs; effort expended on moving from one location to another and the time spent travelling constitute opportunity costs. There is also the risk to personal safety and the “strain” or “stress” of travelling that was mentioned by most interviewees. Also time spent moving from one location to another, increases the time required in fulfilling an order.

Furthermore, the stress/strain and risk to personal safety increases the price charged for the fabric. This is clearly seen in cases where intermediaries have to deliver fabric directly to buyers that live beyond the geographic boundary they are prepared to travel within. Under such circumstances, once the money for the fabric has been paid (e.g. transferred into a bank account), the product is delivered using commercial transport operators. A fee is paid for this service which is passed onto the buyer via the price of the fabric. Furthermore, it is the intermediary and not the buyer that bears the risk of non-delivery.

In conclusion, aside from reducing the need to travel whilst searching for trade partners and raw materials, the impact of telephones in managing the impact of geography is so far minimal. This is largely due to the requirements of face-to-face contact in the industry. So whilst the research finds evidence to support the supposition that “Geography has an impact on trade”, there is insufficient evidence to show that “Telecommunications is a tool through which the impact of geography can be managed”. Rather, the data from the research shows that telephones help to manage some impact of geography on communications for trade.

3 Conclusion on Research Findings

The factors driving the use of telephones in the Aso Oke industry were identified in Chapter 7. This chapter has shown the ways in which

telephones are used in addressing those factors. Both chapters have provided evidence to support all the suppositions of this research with one exception. Whilst the data collected during the field study was able to identify some of the impact geography has on the *Aso Oke* industry, there was insufficient support for the supposition that telephones were tools for managing the impact of geography. Rather, the data collected showed that with respect to geography, telephone use was relevant in managing some forms of communication.

The implications of these findings will now be discussed. Firstly, the implications of the research findings to the wider body of literature will be discussed. Here the findings will be compared to the reported benefits of telecom use documented by other studies. These include the reduction of transport cost as a result of substitution for travel (Bertolini 2002; Saunders et al. 1994), reduction in communication costs (Scott et al. 2004; Bedi, 1999), and restructuring of the organisation of trade (Chowdhury and Wolf, 2003; Graham, 1998).

Secondly, implications will be discussed with respect to the hypothesis of this research. This hypothesis states that:

The information economising advantages of telecom use will promote the creation of specialised intermediaries in industries resulting in organisational structures that are able to support and promote higher levels of trade.

This discussion will therefore conclude on whether the data collected from the case industry has shown this to be true.

3.1 Findings of Research in Relation to Other Studies

The theoretic interrelationships that exist between the themes of this research (as highlighted in the Conceptual Framework - Chapter 4) have been analysed and reported by other research studies. The findings and

conclusions of some of these studies are now highlighted and discussed alongside the findings of this research.

3.1.1 Overall Impact

Various micro-level studies of the impact of telecommunication technologies (including telephones) were discussed in Chapter 3 of this thesis. These studies assessed the use of information and communication technologies (ICTs) for both social and economic needs. ICTs, in particular the telephone, have been found to be used predominantly for social purposes rather than economic goals (Souter et al., 2005; Goodman, 2005; Gamos, 2003; Bertolini 2002, Bayes et al., 1999). It is therefore not surprising that more studies into documenting evidence of the telephone's contribution to social development has steadily been increasingly. The economic contributions of ICTs however continue to be mainly anecdotal. This vagueness in distinction between the perceived and actual benefits of telephones makes it difficult to decipher the true economic impact of telephones (especially to micro-enterprises). For example, Duncombe and Heeks in their study of the use of ICTs by Small and Medium Entrepreneurs in Botswana noted the actual benefits of telephones as:

“...the information-related technology that has done the most to reduce costs, increase income and reduce uncertainty and risk. Phones support the current reality of informal information systems, they can help extend social and business networks, and they clearly substitute for journeys and, in some cases, for brokers, traders and other business intermediaries.” (2001, p. 18)

The above can be compared with the summarised and more enthusiastic articles on the perceived value of telephones featured in the mainstream press; for example:

“Phones let fishermen and farmers check prices in different markets before selling produce, make it easier for people to find work, allow quick and easy transfers of funds and boost entrepreneurship ... A recent study by London Business School found that, in a typical

developing country, a rise of ten mobile phones per 100 people boosts GDP growth by 0.6 percentage points⁸⁴." (The Economist, 2005, p. 53)

Such articles create unrealistic expectations of telephone use and drive dissatisfaction among users who are unable to see such direct benefits in usage.

The overall impact of telephone use as observed in this research were that telephones contribute to the effective functioning of organisations by increasing the awareness of business opportunities in the industry and shortening the time taken to fulfil orders. This faster 'time to completion' is achieved because telephones increase the speed at which:

- a. Trade participants are selected
- b. Order requirements are agreed and acted upon
- c. Raw materials are sourced and procured
- d. Design corrections are communicated and implemented
- e. Trade issues or changes are resolved
- f. and availability of completed orders are communicated

The overall impact of telephone use can be broken down further and these parts are discussed and compared in the following sections.

3.1.2 Substituting for and Complementing Travel

Prior studies have highlighted the substitution effect telephone use has with respect to making journeys (Samuel et al., 2005; Bertolini, 2002; Duncombe and Heeks, 2001). This study found that the use of telephones either substitutes for travel or complements it by increasing the probability that the journeys (when they occur) will be efficient. For example, without telephones, weavers have to physically travel to intermediaries in their

⁸⁴ The actual research finding was that "All else being equal, in the 'low income' sample, a country with an average of 10 more mobile phones per 100 population (between 1996 and 2003) would have enjoyed a per capita GDP growth higher by 0.59 percent." (Waverman *et al.*, 2005:18)

search for orders. This can at times be a 'wasted journey' as there is no guarantee that the intermediary will have an unallocated order on the day the weaver visits. According to one of the weavers interviewed:

Having her own phone means that she can receive and make calls at any time, this makes her more accessible for orders ... [the weaver] uses her phone to look for orders rather than travelling to buyers' homes.

This is a view shared by other weavers interviewed; the general consensus is that resources in terms of time, and money spent on travel can be better managed through the use of the telephone. Likewise, prior to the use of telephones, intermediaries who had an order to fulfil would have to travel to the location of weavers at risk to their personal safety. Having a telephone therefore makes the process of distributing orders faster and also makes life easier in terms of movement.

The research however found that substitution occurred primarily at the start of the ordering process when participants are searching for transaction partners. Once a partner had been identified telephone use functions as a complement to travelling. Calls are placed to arrange times and location of meetings rather than travel being embarked upon on the blind faith that the trade partner will be available. However, because design and other specifications of an order have to be communicated face-to-face and samples of the design once produced have to be physically inspected by the intermediary and/or buyer, physical movement by participants still has to take place. The need to travel is therefore not eliminated but rather reduced to essential movements that have more predictable outcomes.

3.1.3 Reducing Communication Costs

Perhaps the most emphasised attribute of telephones is their ability to comparatively lower communications costs (Scott et al., 2004; Donner, 2003; Saunders et al., 1994). Comparative in the sense that when the alternatives to

telephone use are considered, it is often the cheaper option – particularly as the distance between transacting parties increases. The alternative means of communication in this research was physical movement between trading parties.

The bulk of the activities carried out by participants in the *Aso Oke* industry relate to the supervision and monitoring of trade partners. These activities require a high degree of communicative ability and as telephones provide the means to verbally communicate information at speed, relatively cheaply, and without the limitation of geographic distance, their use is potentially of relevance.

The role telephones play at the start of the transaction process, particularly during the selection of a trade partner, and at the end of the transaction process in notifying partners of the collection of finished products has already been discussed (see section 3.1.2). In-between these two stages, telephones are used in communicating changes and informing trade partners of issues arising during the production of the fabric. They are also used as a supplement to finding out information on status of the fabrication process, and in setting up appointments to visit trade partners during any of the stages of production.

However, to quote one of the intermediaries interviewed, “even with the use of telecoms, visits are still made to the weaving workshops”. Due to the uncertainties that exist within the industry, physical verification of the status of an order is still very much the norm and telephones are not perceived as being effective in gathering information about the behaviour of participants. There are therefore conditions that need to be met prior to telephone use being advantageous in supervising and monitoring behaviour. Specifically, the extent to which the participants engaged in trade trust one another will

determine the extent to which they will be satisfied in communicating and discussing order details and progress over the telephone without physically verifying that what has been said is indeed true.

3.1.4 Restructuring Organisations

Studies that focus on, and promote the information economising property of telecom technologies predict that their adoption for business purposes would result in the reduction of intermediation (Müller-Falcke, 2001 and references therein). Suppliers, who are now able to access market information relating to their products, either negotiate better rates with intermediaries, or sell directly to buyers (Chowdhury, 2004; Duncombe and Heeks, 2001). Telephones also helps suppliers to gather information about inputs required for production and this results in higher quality inputs being sourced at better rates. Telephones are therefore said to:

“...completely restructure production processes and transaction methods, increase flexibility, and improve outputs” (Chowdhury and Wolf, 2003, p. 2).

Telephones have contributed to the restructuring of the *Aso Oke* industry but in more modest ways than the quote above suggests. These contributions are discussed below:

3.1.5 Production processes

Production processes in the *Aso Oke* industry are performed by weavers, often with the coordination of intermediaries. Changes to production processes would therefore be observed in the relationships that exist between intermediaries and weavers. This research found that restructuring of the relationship between intermediaries and weavers, when it did occur, was associated with the type of access participants had to telephones. The higher the level of vertical integration observed the more likely it was that both weavers and intermediaries had personal ownership of a telephone (rather than access via a third party).

There was however no evidence in this research that ownership of telephones encourages vertically integrated organisational forms in the industry. Rather, intermediaries that had invested in establishing integrated firms were also ensuring that they had ready access to the weavers they had commission to weave exclusively for them. There is therefore an association between personal ownership of telephones and vertically integrated organisations, but this does not suggest causality. Thus whilst telephones reinforce and confirm existing production structures in the *Aso Oke* industry, they were not observed as driving them.

3.1.6 Transaction methods

The manner in which transactions are conducted in the *Aso Oke* industry have remained largely unchanged. This is exemplified by the continuing presence and viability of the main forms of organisation in the industry⁸⁵. These forms of transacting are determined by the risk appetite and financial capabilities of the participants. Data obtained during this research showed that due to the high level of uncertainty in the *Aso Oke* industry, the most common forms of organisations had intermediaries at their core. The research highlighted the dependence of trade partners on intermediaries to navigate the uncertainties that are prevalent in the industry and the physical distances between participants.

This dependence is largely as a result of the nature of the product being traded and the type of information required for making decisions during the different transaction stages. Chapter 7 highlighted the fact that the uncertainties in the industry which have resulted in participants preferring to use intermediaries are derived not so much from asymmetries of public information - which can be easily acquired and transmitted through

⁸⁵ See discussion on organisational forms in section 2.3 of this chapter

telephones; but are predominantly derived from asymmetries of private information - information that has been acquired, verified, otherwise worked upon and available to one person but is costly for others to obtain. This research found that it is difficult to use telephones to transmit this type of information to reap cost saving and/or money making benefits in the manner advocated in literature.

3.1.7 Flexibility and Output

The alternative forms of organising trade described in section 2.3 of this chapter provide participants in the industry with greater flexibility in their transactions. For weavers, this flexibility extends to the type of organisation they can participate in whilst securing orders and include- independent entity, outsourcing partnerships, and/or network organisations. Access to a telephone is increasingly an important criterion for selecting trade partners, especially in selecting weavers to transact with. Whilst weavers still have to come to the buyers/intermediaries location to receive details of the order, notifying them of the work opportunity is much faster with a phone and is increasingly the preferred choice of contact. Weavers who do not have access to phones lose out on orders.

For intermediaries flexibility is (paradoxically) conveyed in terms of scope for control. Through improved coordination abilities, they are better able to track and monitor orders through the use of telephones. Greater control facilitates quality improvements and this has a positive impact on output. It should however be noted that telephone use and the flexibility conveyed exists within established relationships built on trust and reputational capital or on systems of monitoring behaviour that are backed up by sanctions.

Whilst other researchers like Duncombe and Heeks (2001) and Donner (2005, 2004b) observed that phones help to extend business networks by helping

Whilst other researchers like Duncombe and Heeks (2001) and Donner (2005, 2004b) observed that phones help to extend business networks by helping microentrepreneurs to develop business contacts that they previously could not or did not maintain, this research found no evidence that telephones were solely able to do this. Rather this research found data that showed that telephones helped to improve existing contacts much more than enabling new ones. This finding is due to: the nature of the *Aso Oke* industry – referral is a key part of selection of trade partner; spatial dispersion of production and consumption; and characteristic of the product – highly customised, occasional good. These factors make the risk of getting things wrong in the industry too high for most participants.

3.2 Findings of Research in Relation to Research Hypothesis

The hypothesis of this research states that:

The information economising advantages of telecom use will promote the creation of specialised intermediaries in industries resulting in organisational structures that are able to support and promote higher levels of trade.

Using the findings of the study this section comments on the validity of this hypothesis.

Whilst the research found evidence that telephones do have an impact on the organisation of trade, it also found that this impact is exerted within existing structures in the industry. As Duncombe and Heeks (2001) observed, “phones support the current reality of informal information systems” (2001, p. 18). The “current reality” in the *Aso Oke* industry is a trading system dominated by intermediation. Some research studies (Samuel *et al.*, 2005; Chowdhury, 2004; Müller-Falcke, 2001) and media articles (Economist, 2005; Ross, 2004) have equated the use of telephones to mean the by-passing or substitution of intermediaries. This was not found to be the case in this

research. Rather, telephones were seen as strengthening the role of intermediaries in the *Aso Oke* industry.

This finding is as a result of the nature of the industry and characteristics of the product being traded. In the *Aso Oke* industry, telephones were used in reducing uncertainties arising from imperfections of non-private information (for example availability of raw materials etc.). Reduction of uncertainties arising from private information relied on physical verification than telephone use. This added cost of verification has resulted in industry participants preferring to use intermediaries who are better able to navigate the risks associated with the trade.

3.2.1 Specialised Intermediaries

Having established the place of intermediation, this research hypothesised that the information economising benefits accruing from telephone usage would promote the existence of specialised intermediaries in the *Aso Oke* industry. When telephone usage makes intermediaries more effective and efficient in their function their position is further consolidated in the industry. This improved ability also allows them to refine and/or provide a more specialised service.

An example of this phenomenon that was exhibited in this research is the network organisation described earlier in this chapter (section 2.5.2) in which a weaver takes on the role of coordinator – obtaining orders from different intermediaries and allocating these amongst a network of weavers. Such a weaver-coordinator would ordinarily have been limited to the function of masterweaver. However, the increased accessibility and mobility afforded by having a telephone means that leads/referrals can be pursued more speedily and the increased manpower enabled by the network of weavers significantly increases the output of the network. This is therefore a structure

that is able to support and promote higher levels of trade than that of a masterweaver.

However, these structures were not found to be common place in the industry. In fact this research only came across one example. This may be a function of the relative age of accessible telephony in the case country (see Chapter 1). Thus although there is evidence to support the hypothesis:

The information economising advantages of telecom use will promote the creation of specialised intermediaries in industries resulting in organisational structures that are able to support and promote higher levels of trade.

This evidence is weak and requires further research. This weakness is discussed in more detail in section 5.

Chapter 9 Conclusions

This research comments on the extent to which the use of telephones has improved the organisation of trade in the *Aso Oke* industry. It has focused on the information economising abilities telephones convey and particularly their impact on transportation and communication costs. This was achieved by first identifying uncertainties created by instances of information imperfections in the industry. The mechanisms adopted to reduce these uncertainties and the risks emanating from them were then identified. Lastly the ways in which telecom use supported the mechanisms were documented.

The following section (section 1) highlights the theoretic and practical contributions of this research to the existing body of literature. The limitations of the research are discussed in section 2 and opportunities for further research identified in section 3

1 Reiterating the Conceptual Foundation of the Research

As explained elsewhere in this thesis (Chapters 3 and 4), there are five interwoven themes underpinning this research. These are: information, geography, organisational forms, intermediation, and the use of telephones.

1.1 Information

This research considers information to be the major motivator for telephone use. The research assessed the demand for telephony from the perspective of demand for information, and using the *Aso Oke* industry as a case study analysed the contribution of telephones in developing more efficient ways of acquiring information.

Information is required in order to generate, conduct and complete trade. Where information is missing or is incomplete, uncertainties in trade transactions exist. These uncertainties hinder trade and those identified by the research and the influences they exert on the industry are discussed in Chapter 7.

1.2 Geography

Geography is defined as the physical distance between suppliers and buyers. Two key sources of uncertainty in the case industry are the difficulty in predicting the behaviour of trade partners and imbalances in the supply and demand of raw materials. Distance makes it more difficult to observe and monitor behaviour and also increases the cost of obtaining information and inputs of production. The cost of acquiring raw materials and delivering finished products also increases with distance. Distance therefore accentuates information imperfection and thus uncertainty.

1.3 Organisational Forms

A key impetus for the formation of organisations is the availability and management of information. The operation of any market requires participants to make decisions on the basis of the information available to them. However, due to information imperfections participants do not possess all the information they need to maximize the efficiency of their decisions. Furthermore, increasing the amount and quality of information available so as to make better decisions comes at a price and contributes to the overall cost of business transactions. There is therefore an incentive in business to reduce information and transaction costs to manageable bounds, and this provides the rationale for collective action through the formation of organisations.

1.4 Intermediation

When information imperfections are found to be exerting a limiting effect on trade, intermediaries act as facilitators. When people have difficulties in making contact with each other and when communication between buyers and sellers is hard to achieve, intermediaries perform matchmaking and brokering activities. They also help to express what buyers want and negotiate price. Intermediaries are also instrumental in monitoring the fulfilment of contracts.

Given the levels of information imperfections in the case industry, the adoption of intermediary activity and references to the use of intermediaries was prominent in the data. Intermediation was consistently highlighted as a means of coping with uncertainties in the industry.

1.5 Telephones

Telephones support the intermediation function by allowing production, distribution, and management activities to be allocated between more, or the most appropriate members of an organisation. At the same time, telephones enable the effective and efficient coordination of such activities. Telephones therefore help the intermediary to manage the distance between economic entities and communication during trade transactions. This research considered two activities in particular – communication and transportation and the costs associated with them. It found telephones played a role in managing both.

2 Contributions of Research

The following section identifies the contribution this research makes to the general body of literature on telecommunications and economic development. This discussion includes practical implications of this research.

2.1 Research adds to micro-level understanding of the impact of telephones

As noted in Chapter 4, due to difficulties in isolating the microentrepreneur from the household s/he supports (Donner, 2004a), most studies of the impact of telephones at the micro-level combine the impact on micro-enterprises with household studies. These studies tend to have a wider remit of analysis – researching both economic and social uses of the technology. However, because telephones are used more for social purposes than for business purposes the focus of such studies is directed proportionally more towards social benefits than on documenting and examining economic implications. This study does not consider the social uses of telephones. Instead it only documents how telephones are used in relation to business purposes. It therefore directly contributes to increasing understanding of the benefits and limitations of telephony in an economic context.

Furthermore, the research is a qualitative study conducted on an informal sector microenterprise within a developing country environment. It therefore addresses a specific gap in the literature by providing a detailed descriptive evidence of the use of telephone technologies by an important contributor to poverty alleviation. This is because for the majority of poor people in developing economies, income generation is attained through engagement in informal sector microenterprises. The better these enterprises perform the more opportunities there are for people to participate in them and improve their economic prospects. Identifying the ways in which telephones facilitates such enterprises can inform the development of appropriate policy to foster such development.

An example of such a policy would be affordable access. This research has shown that the type of access participants have to telephones has an impact on the level of benefit they enjoy by their use. Participants in the industry

with personal ownership of telephones – in particular mobile phones, benefit from the increased accessibility and mobility it permits. This conveys advantages of flexibility that can be turned into increase in output and as such profitability. The study therefore provides support for initiatives that create access to telephones in an affordable manner.

This research also addressed a specific contribution of telephony – i.e. the minimisation of information costs and specifically transportation and communication costs. Literature indicates that the performance of enterprises is greatly enhanced by access to relevant information and by the ability of their owners to act upon such information. This research therefore helps to contextualise the use of telephones and shows that their effectiveness depends on the context of their use. As noted by Halavatau (2003), telephone technology itself does not create information nor verify its validity; these still require “human endeavour”. By narrating the usage pattern and purpose to which telephones are put, this research contributes to micro-business development literature by providing insight into how telephones address the issue of information acquisition and the limitations of its effectiveness due to external or contextual influences.

2.2 Research adds to understanding of the role of intermediaries

As stated by Ehrlich and Cash (1999) merely having access to information does not make intermediaries unnecessary. This research provides support for this statement and increases understanding of the circumstances in which intermediaries play a valuable role. In the case industry, their aggregation of information, for which they also provide quality guarantees, continues to assure their necessity.

This research draws attention to the circumstances in which telephones are poor substitutes for activities performed by intermediation. There are certain

types of information needs that telephones are unable to directly meet. In this case study, telephones are poor for combating opportunistic behaviour and as such are poor substitutes for physical verification (even though they complement it by allowing for better scheduling of visits). The research therefore recommends that prior understanding of industry characteristics be acquired before technologies are recommended. This will aid the selection and implementation of the most appropriate technology for the environment and purpose. Such an understanding would help to identify the need the technologies are meant to address and their suitability in addressing such needs.

Finally this research has highlighted the issue of trust in information gathering and dissemination. This issue is present in the distinction between private and public types of information and serves as a limiting factor on the efficacious use of telephones. This is because the applicability of telephones for the transmission of private information requires establishing an environment of trust. Whilst issues of trust feature prominently in information economics literature, they are yet to be fully incorporated in telecommunications and development studies. Yet until this is done, claims of the information economising impact of telephone use on the organisation of trade can be faulted for not reflecting the limitations of what telephones can do for economic development.

3 Limitations of Research

Certain limitations should be borne in mind when considering the contributions of this research. These are described below:

3.1 Selection of the Case Industry

Several references have been made to the nature of the case industry and the characteristic of the product being traded. *Aso oke* is an occasional good (as

opposed to a convenience good) and therefore trade in the product is more information intensive. Furthermore, with occasional goods, more importance is attached to private information as opposed to public information. These qualities of the chosen case industry and product which make it possible to quickly identify the contributions and limitations of telephone use therefore also influence the focus and direction of the research.

There is thus the possibility that application of the research to an industry whose emphasis is on public rather than private information or whose transactions are lower in information intensity, would result in different forms of organisations and patterns of telephone use being observed. This is because in a market for convenience goods much of the information required during transactions is public and standardised. Telephone use is therefore expected to be more prevalent. Also, buyers face less risk and can therefore engage more directly with suppliers rather than having to rely on intermediaries.

3.2 Scale and Scope of Case Study

Due to financial and time constraints on the researcher, the scale and scope of the study had to be strictly managed (see Chapter 5 for more details). As such only three participant types were interviewed during the research - masterweavers, intermediaries, and buyers. A broader range of participants may have provided richer descriptions as a broader range of perspectives obtained and documented. In particular, the inclusion of thread dealers in the study would have provided first hand accounts of how telephones have influenced their relationships with weavers and intermediaries. This would have either reinforced or balanced the descriptions provided by weavers and intermediaries.

Furthermore to minimise the threat of Researcher Bias (see Chapter 5 section 10.1), the sampling technique employed required that contacts be approached independently and to the extent possible the researcher avoided interviewing individuals that were associated with existing contacts. This meant that when an intermediary was interviewed the researcher did not ask for an introduction to the weavers that work with/for them and vice versa. This was done to ensure that participants of the research did not associate the researcher with a more/less powerful player in the industry. This sampling technique however poses a limitation on the research as it eliminates a readily available means of triangulating the data received by one participant to the trade. The implied assumption of the technique is that the transactions in the industry are sufficiently similar and unrelated participants face the same set of circumstances.

3.3 Temporal Dimension of Research

Even at a personal level, the use of telephones is dynamic – it changes with time as habits are formed and the user becomes more familiar with the technology and dependent on it (see Lasen, 2002). This characteristic is likely to also occur at business and industry levels as standards for communicating set in. This research on the other hand provided a snapshot of how telephones were being used at a specific point in time in the *Aso Oke* industry. Also, telephones have only recently become accessible to a wider percentage of the population of the country in which the case industry⁸⁶ is located. Availability of the technology is therefore new to a section of the sample (weavers in particular) and it is likely that with time, the level of use of telephones will change.

⁸⁶ This accessibility coincides with the licensing and launch of GSM mobile operators in the country (Nigeria) in 2001-02.

4 Further Research

The research's methodology of selecting a need and assessing the ability of telephones to meet it was adopted so as to provide context within which the results of the research can be considered. As discussed in section 2.1 of this chapter, this is believed to be an appropriate approach that can help to ensure that the most appropriate technology is being used to address identified needs. The ways in which this research can however be extended to achieve this objective, especially in light of the limitations discussed above is addressed in this section.

Firstly, and so as to assess the adaptability of the conceptual framework to other micro-enterprises, this research can be replicated in a variety of ways. The study could be applied to other micro-enterprises in the same developing country, informal economy setting. Industries with similar dependencies on private information (i.e. other occasional goods) may be researched to test the conclusions made on the impact of trust on telephone use. The research could also be replicated in an industry characterised by a higher dependence on public information – such as the agricultural sector or market for convenience goods. This would test the relevance of type of information and the impact this has on telephone use.

Secondly, the scope and scale of the study could be expanded to include other participants in the industry. As uncertainty about the supply and demand of required thread constitutes a significant problem this expansion could include thread dealers and manufacturers. These participants are external to the *Aso Oke* industry and yet have such a big impact on its effectiveness; including them in analysis would therefore provide valuable insight into the impact of telephones in managing communication and coordination across related industries. The location of the research could also be expanded to include more rural weaving centres. It was identified in

Chapter 7 that due to the *Aso Oke* industry being buyer driven and initiated, demand is concentrated in densely populated areas and as such those visited in this research were in close proximity major towns and cities. Expanding the geographic scope of the research would provide deeper insight into the impact of telephone use in managing distance and its economic relevance to the outsourcing structures identified in this study.

Third, the temporal nature of the study could be addressed by conducting a longitudinal survey of telephone use in the industry. This could be performed using an action research methodology in which the technology is introduced and its use and impact monitored over time and across functions. Such a study would provide insight on not only the limitations of telephone use but also on how the limitations are themselves addressed.

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Appendix 1: Data source for Affordability versus Teledensity chart (see Figure 11)

Country	Affordability	Teledensity
Cambodia	0.1061	0.26
Burundi	0.1069	0.34
Bangladesh	0.4468	0.55
Mali	0.2880	0.56
Ethiopia	0.4543	0.63
Myanmar	0.0006	0.68
Nigeria	0.1784	0.71
Eritrea	0.2365	0.92
Benin	0.3186	0.95
Lao P.D.R.	0.0917	1.23
Solomon Islands	0.0471	1.31
Mauritania	0.0499	1.39
Cote d'Ivoire	0.0388	1.43
Djibouti	0.0635	1.52
Nepal	0.1015	1.57
Lesotho	0.0750	1.61
Comoros	0.2517	1.66
Senegal	0.1154	2.21
Pakistan	0.0469	2.66
Sudan	0.0542	2.70
Gabon	0.0225	2.87
Vanuatu	0.0646	3.15
Bhutan	0.0425	3.43
Nicaragua	0.2431	3.74
Tajikistan	0.0144	3.75
Indonesia	0.0364	3.94
India	0.0309	3.97
Morocco	0.0429	4.05
Philippines	0.0367	4.12
Swaziland	0.0170	4.43
Honduras	0.0206	4.87
Sri Lanka	0.2242	4.90
Viet Nam	0.1096	5.41
Mongolia	0.1134	5.62
Cuba	0.0362	6.40
Namibia	0.0153	6.62
Algeria	0.0221	6.93
Samoa	0.0112	7.29
Botswana	0.0114	7.49
Kyrgyzstan	0.0468	7.61
Albania	0.0518	8.30
Oman	0.0036	8.84
South Africa	0.0100	10.40

Country	Affordability	Teledensity
Maldives	0.0595	10.48
Thailand	0.0355	10.49
Venezuela	0.0122	11.06
Belize	0.0149	11.27
El Salvador	0.0030	11.34
Jordan	0.0350	11.36
Dominican Rep.	0.0158	11.54
Tunisia	0.0242	11.77
Panama	0.0118	12.24
Ecuador	0.0285	12.24
Fiji	0.0165	12.35
Egypt	0.0805	12.73
Georgia	0.1208	13.43
Armenia	0.0229	14.83
Suriname	0.0721	15.17
Saudi Arabia	0.0093	15.54
Cape Verde	0.0174	15.63
Mexico	0.0176	15.99
Colombia	0.0556	17.93
Malaysia	0.0031	18.16
Kuwait	0.0086	19.60
Romania	0.0045	19.94
Lebanon	0.0148	20.00
Moldova	0.2814	21.93
Iran (Islamic Rep. of)	0.0587	21.97
Chile	0.0097	22.10
Brazil	0.0051	22.29
Argentina	0.0153	22.63
Ukraine	0.0321	23.34
Lithuania	0.0001	23.92
Slovak Republic	0.0054	24.08
Bosnia and Herzegovina	0.0967	24.48
Seychelles	0.0110	25.60
Qatar	0.0016	26.12
Turkey	0.0014	26.75
Bahrain	0.0042	26.76
St. Vincent and the Grenadines	0.0118	27.25
Costa Rica	0.0099	27.77
United Arab Emirates	0.0025	28.11
Latvia	0.0117	28.19
Mauritius	0.0078	28.52
Grenada	0.0200	29.04
Belarus	0.0119	31.11
Estonia	0.0095	34.12
Hungary	0.0179	34.86

Country	Affordability	Teledensity
Czech Republic	0.0140	36.03
Bulgaria	0.0219	38.05
Croatia	0.0117	38.87
Slovenia	0.0062	40.68
Portugal	0.0055	41.11
New Zealand	0.0014	44.85
Singapore	0.0008	45.19
Greece	0.0021	45.39
Japan	0.0186	47.19
Austria	0.0033	48.07
Belgium	0.0025	48.92
Ireland	0.0038	49.13
Finland	0.0033	49.20
Malta	0.0045	52.07
Korea (Rep. of)	0.0046	53.83
Australia	0.0051	54.23
Hong Kong	0.0027	55.89
France	0.0018	56.44
Cyprus	0.0041	57.19
United States	0.0011	62.38
Canada	0.0014	65.14
Germany	0.0020	65.85
Denmark	0.0036	66.93
Luxembourg	0.0011	79.75

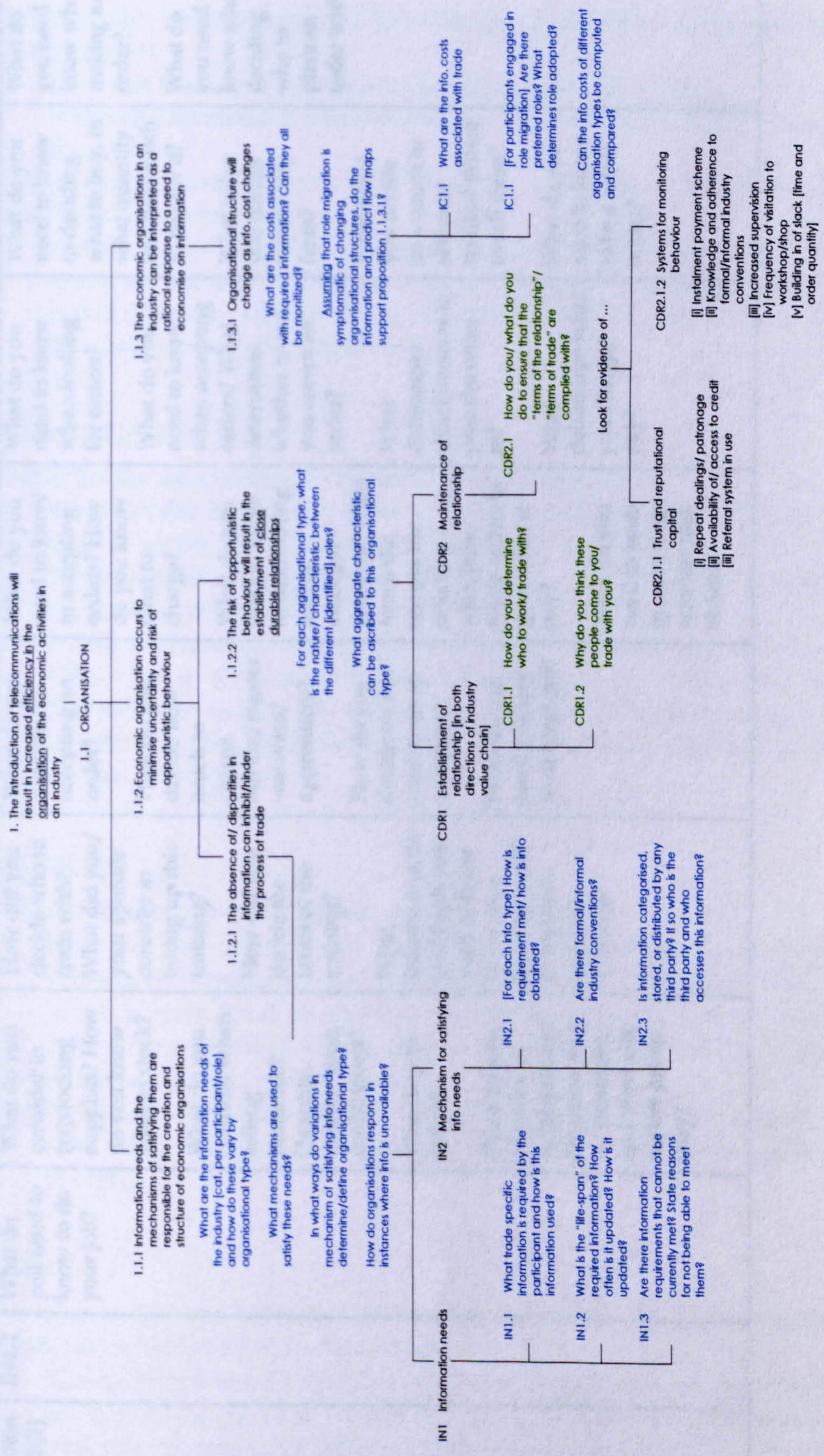
Notes:

Affordability = Residential telephone connection charge divided by GDP per capita (2003)

Teledensity = Main telephone lines per 100 inhabitants (2003)

Source: ITU World Telecommunications Indicators Database

Appendix 2: Question Framework example: "Telecommunications is a tool that is utilised in the reduction of information cost"



IN = Information Needs
 CDR = Close and Durable Relationship
 IC = Information Costs

Appendix 3: Customised questions developed to uncover information needs of industry roles

TOPIC	CODE	SUMMARY QUESTION	RAW MATERIALS SUPPLIER	APPRENTICE WEAVER	WEAVER	MASTER-WEAVER	INTERMEDIARY	WHOLESALE BUYER	RETAIL BUYER
Information needs [INI]	INI.1	What do you need to know to do your job?	<p>What do you consider in (re)stocking supplies? How do you know what to stock?</p> <p>What do you consider when selling materials? Quantity, quality/type, credit terms?</p> <p>Who do you sell to?</p> <p>What do you consider in setting prices? Do prices vary by customer, and what else makes prices vary?</p>	<p>How did you decide who to train with? What did you/your sponsor consider in taking up this training?</p> <p>How did you decide the terms of the training?</p> <p>What information do you think you need to know to do your training well/ to become good at weaving?</p>	<p>What do you consider in accepting an order?</p> <p>How do you decide how much to charge buyers/master weavers/apprentices?</p> <p>How do you decide on the conditions of contracts?</p> <p>What do you need to know to do your job?</p>	<p>What do you need to know in accepting orders? How do you know what to charge?</p> <p>What do you need to know in distributing orders amongst weavers? What forms the criteria for selection - who, how many orders to give, what to pay?</p> <p>What do you need to know in managing weavers and orders?</p>	<p>What do you need to know when looking for orders?</p> <p>What do you need to know when accepting orders? What determines whether or not you accept an order?</p> <p>What determines which weaver to pass the order to?</p> <p>What determines what you charge/pay?</p>	<p>What do you need to know in deciding what to buy, in what quantity and how much to pay for it?</p> <p>What helps you decide who to buy from?</p> <p>What helps you decide how much to sell your textiles? Where to sell them?</p> <p>What do you need to know to be a better trader?</p>	<p>What do you need to know when making an order?</p> <p>What do you need to know when deciding who to place an order with?</p>

Appendix 4: Redefined Interview Questions

Telecom use

1. What impact does telecom use have on the information imperfections in the industry?
 - 1.1. How has the use of telecoms made trade easier for you?
 - 1.2. Is the effectiveness of telecom use dependent on anything? What are these things?
2. What impact does telecom use have on the geographic location of production and demand?
 - 2.1. Where are the interviewee's suppliers and customers located? How dispersed are they in relation to interviewee? Where applicable, how is this distance managed? [tie in with Q. how do you decide who to take order from/give order to?]

Information imperfections

1. What are the information imperfections in the industry?
 - 1.1. What are the things that must be known and/or done to ensure that trade is successful? [tied to intermediary activity]
 - 1.2. What difficulties arise in your role as a _____? What in your opinion causes such difficulties?
2. How does the industry respond to these information imperfections?
 - 2.1. What codes of conduct/habits/mechanisms of trade have been devised to overcome difficulties and information imperfections? [tie in with telecom use by asking do any of these coping devices involve the use of telecoms?]

Intermediary activity

1. What intermediary activities occur in the industry?
 - 1.1. How are the activities of suppliers and customers co-ordinated? What factors determine the decisions that are made in doing this?
 - 1.2. What is considered in looking for orders, securing orders, pricing orders, and ensuring the continuation of trade? In terms of quality, relationship, cost/profit, price etc.
 - 1.3. Need to determine extent of intermediary activity played by role/interviewee, and importance of this role to the organisation of the trade.

Firm behaviour

1. In what way is the behaviour of the firm influenced by the information imperfections identified in the industry?
 - 1.1. [Continuing from questions on information imperfections] In relation to the idiosyncrasies identified in a particular organisational structure: do you wish things could be done differently?

- 1.2. Are there alternatives to this way of conducting the trade? [Confirm why trade is performed in the manner in which it has been described].
- 1.3. Are the information imperfection coping mechanisms specific to certain roles? What makes them specific to these roles? Can the interviewee easily adopt them or are there constraints? What are these constraints?

Attractiveness of roles

1. How does the behaviour of the firm/interviewee change to create/take advantage of revenue generating opportunities?
 - 1.1. What [in the interviewee's opinion] are the factors that create revenue generation opportunities? Increased volume, increased variety, better quality, better relationships, bigger market, increased [social/geographic] reach of trade etc.
2. How does the behaviour of the firm change to increase cost saving capabilities?
 - 2.1. What [in the interviewee's opinion] are the factors that contribute to cost saving capabilities? In what ways do you think you can save money in conducting trade?
3. Can the interviewee identify ways in which the manner they have participated in trade has changed/changes to bring about these opportunities or capabilities? Do any of these changes constitute a change in role?
4. What things do you wish you could change to make your business/experience better?
5. Are there limitations to the extent to which the interviewee can alter his/her behaviour? What are these limitations/constraints?
6. Can new combinations of roles be seen emerging?

Appendix 5: Interview Script

Opening script:

“Thank you once again for taking part in this research. As mentioned whilst arranging this interview, this research is interested in finding out the actual and/or potential impact telecommunications has on the Aso Oke industry. In order to do this, this interview will touch on three main areas; the role[s] you play in the industry and the information you need to perform these roles successfully; the way in which you coordinate your activities and those of other participants you must work/trade with; and the ways in which changes in what you do affects the activities of other people in the industry. If applicable, your use of telecommunications will also be discussed during the process of the interview. The interview should last for about one to one and a half hours.

With your permission, I would also like to tape the interview, this will enable me to make more complete notes of our interview helping me fill in gaps and ensuring that I include all your key/important points in my analysis. If you are at all uncomfortable with this please let me know ... [thank participant if permission is given, and if not reassure them that you understand their hesitation and reassure that you are able to perform interview adequately without the use of a tape recorder].

If you are ready, may I start by first asking you ...”

1. ... to describe what you do/your role in the Aso Oke industry.
2. What are the things that must be known and/or done to ensure that trade is successful?
3. Where are your suppliers and customers located?
 - 3.1. How dispersed are they in relation to your business?
 - 3.2. Where applicable, how is this distance managed?
 - 3.3. Does this distance have an impact on who you decide to take an order from/give order to?
 - 3.4. In general, how are the activities of suppliers and customers coordinated?
 - 3.4.1. What factors determine the decisions that are made in doing this?
4. What else is considered in relation to looking for orders, securing orders, pricing orders, and ensuring the continuation of trade? For example, what impact do any of the following have; quality, relationship, cost/profit, price etc.
5. What difficulties arise in your role as a _____?
 - 5.1. What in your opinion causes such difficulties?
 - 5.2. How do you cope with these difficulties?
 - 5.3. Are there alternatives to this way of conducting the trade? [Confirm why trade is performed in the manner in which it has been described].
 - 5.4. What do you wish could be done differently?
 - 5.5. Can your recommendations be adopted by anyone in the trade?

- 5.6. Are the coping mechanisms specific to certain roles? What makes them specific to these roles? Can the interviewee easily adopt them or are there constraints? What are these constraints?
6. Do any of these coping devices involve the use of telecoms?
 - 6.1. How has the use of telecoms made trade easier for you?
 - 6.2. Is the effectiveness of telecom use dependent on anything?
 - 6.2.1. What are these things?
7. If you were to define success in this industry/business
 - 7.1. What would you say are the factors that create revenue generation opportunities? Increased volume, increased variety, better quality, better relationships, bigger market, increased [social/geographic] reach of trade etc.
 - 7.2. What would you say are the factors that contribute to cost saving capabilities?
 - 7.3. Are there other ways in which you think success can be defined?
 - 7.4. Have there been ways in which the manner you participate in the industry has changed/changes to bring about these opportunities or capabilities?
 - 7.4.1. Are there limitations to the extent to which the interviewee can alter his/her behaviour? What are these limitations/constraints?
 - 7.5. What things do you wish you could change to make your business/experience better?

Closing script:

Use the causal map developed to summarise the key points of the interview then ...

“Again thank you for your time. You have provided some really useful information and made some interesting points. I intend to review and analyse the information you have provided and prepare a document that summarises the interview and would be pleased to share with you at a later date. [Confirm how this document will be shared].

I intend to gather as many views of the industry as possible, and so was also wondering if you had any other members of the trade you would recommend that I also talk to?

Thank you once again for your time.”

Appendix 6: Section of Sample Interview Summary

Notes	Interview Text	Observations
<p>Principal role is based on research classification</p>	<p>Interviewee: Mrs XYZ Business Name: ABC [Principal] Role: Intermediary Date of Interview: Monday 14th July 2003 Location: Interviewee's home Duration: approximately 1.5 hours</p> <p><u>Topic area: Description of interviewee</u> Mrs XYZ is a sell-to-order retailer of aso-oke fabric. She took up this role [about 10 years ago] upon retiring from a career in education and devotes approximately 4 days a week to the running of her business. The business was recommended to her as a <i>natural</i> choice given her interest in fashion; she referred to it [during the interview] as a <i>hobby</i>. She attributes her reputation in the industry to her unique designs and in particular, her flair in combining/matching colours.</p> <p><u>Topic area: Co-ordination required for successful trade</u> <u>Advertising:</u> this is performed principally through carrier bags used to package and distribute orders.</p> <p><u>The design process:</u> for designs initiated solely by Mrs XYZ, she discusses her ideas in terms of pattern and colours with a weaver [see section on weaver selection]. A sample is made by the weaver, which may be altered several times until a satisfactory result is obtained. The cost of this process is borne by the weaver in lieu of the order the sample will generate. Designs may also be initiated by the buyer or through styles identified in social-circuit magazines, with alterations being made, especially in terms of colour of fabric.</p>	<p>Recommended by whom?</p> <p>Confirm state of fabric upon distribution, i.e. does she also/always "join" the fabric strands?</p> <p>What determines satisfaction? Including raw materials?</p>

Appendix 7: A Priori Codes

Concept:	Roles	RL		
	Role Identity [interviewee's classification of self] Weaver; Intermediary; Buyer	RLID RLID		WVR/ITMED/BYR
	Work Status of Role Indigene; Migrant [Re: work location] Autonomous; Dependent	RL RL RL	WKSTAT WKSTAT WKSTAT	Idg/Mig Aut/Dep
	Role Adoption Induced; Natural Economic; Social	RL RL RL	ADP ADP ADP	Ind/Nat Eco/Soc
	[Within] Role Hierarchy Present; Absent	RL RL	HRCY HRCY	+/-
	Attractiveness of Role Present; Absent Cause; Effect	RL RL RL	ATRC ATRC ATRC	+/- Cau/Eff
	Power Relationship	RL	POW	
Concept:	Firm Behaviour	FB		
	Role Behaviour	FB	RL	
	Role Combination Present; Absent Concurrent; Evolutionary [only when present]	FB FB FB	RLCMB RLCMB RLCMB/+	+/- CC/EV
	Role Migration Present; Absent Desired; Unwanted [only when absent]	FB FB FB	RLMIG RLMIG RLMIG/-	+/- Dsr/UnW
Concept:	Firm Behaviour	FB		
	Structure of Transaction	FB	TXN	
	Value Chain Integration Present; Absent Permanent; Temporal Vertical; Horizontal	FB FB FB FB	TXN TXN TXN TXN	INTG INTG INTG INTG
	Trade Partner Criteria Select; Deselect	FB FB	TXN TXN	CRT CRT
	Type of Exchange Discrete; Relational	FB FB	TXN TXN	EXG EXG
	Transaction Cost	FB	TXN	COST

Concept:	Firm Behaviour	FB		
	Organisation	FB	ORG	
	Trust	FB	ORG	TRU
	Ownership	FB	ORG	OWN
	Competition	FB	ORG	COMP
	Efficiency	FB	ORG	EFF
Concept:	Geography	GEO		
	Spread	GEO	SPRD	
	Present; Absent	GEO	SPRD	+/-
	Location	GEO	LOC	
	Absolute; Relative	GEO	LOC	Abs/Rel
	Distance	GEO	DIST	
	Communication; Transportation	GEO	DIST	Comm/Trans
	Territorial Configuration	GEO	TERI	
Concept:	Characteristics of Transaction	CTXN		
	Process	CTXN	PRC	
	Idiosyncratic; Uniform	CTXN	PRC	Id/Uni
	Revenue Generator; Cost Saver	CTXN	PRC	Rev/Csv
	Technique	CTXN	TEC	
	Idiosyncratic; Uniform	CTXN	TEC	Id/Uni
	Revenue Generator; Cost Saver	CTXN	TEC	Rev/Csv
	Decision	CTXN	DEC	
	Idiosyncratic; Uniform	CTXN	DEC	Id/Uni
	Revenue Generator; Cost Saver	CTXN	DEC	Rev/Csv
Concept:	Information	INFO		
	Asymmetric Information	INFO	ASYM	
	Cause; Effect	INFO	ASYM	Cau/Eff
	Information Deficiency	INFO	DEF	
	Communication	INFO	COMM	
	Face-to-Face; Remote	INFO	COMM	F2F/Rmt

Concept: Intermediary Activity	INTMED
Coordination	INTMED CORD
Distance; Activity	INTMED CORD Dis/Act

Concept: Telecom Use	TEL
Present; Absent	TEL +/-

Code	Name and Description	Notes [where applicable]
RLID	<p>Role identification: this is the broad role category the interviewee falls within. There are three possible categories: Weaver, Intermediary, and Buyer [WVR/ITMED/BYR].</p>	<p>Role identification is based predominately on interviewee's description of their role in the industry. However this can be revised /changed by the researcher if the description of the interviewee's duties/ activities warrants it.</p>
RL WKSTAT	<p>Work status of role: this describes the work status of the interviewee in the industry and is at present subdivided into two categories: one, based on the work location of the interviewee, seeks to distinguish indigenous workers from migrant ones, although it should be noted that migration can also be within the country [Idg/Mig].</p> <p>The other sub-category describes the degree of autonomy the interviewee has in relation to other players/roles in the industry [Aut/Dep].</p>	
RL ADP	<p>Role adoption: is used to describe the rational behind the take up of a particular role. Whether it was a borne out of a "natural" decision or one "induced" by an external event[s] [Ind/Nat].</p> <p>Also the adoption of a particular role can be described as being a response to an "economic" stimuli or a "social" one [Eco/Soc].</p>	
RL HRCY	<p>Role hierarchy: is used to identify instances of hierarchy within role categories, and is categorised as being either present or absent [+/-].</p>	
RL ATRC	<p>Attractiveness of role: is used to tag evidence of attraction to particular role types</p>	

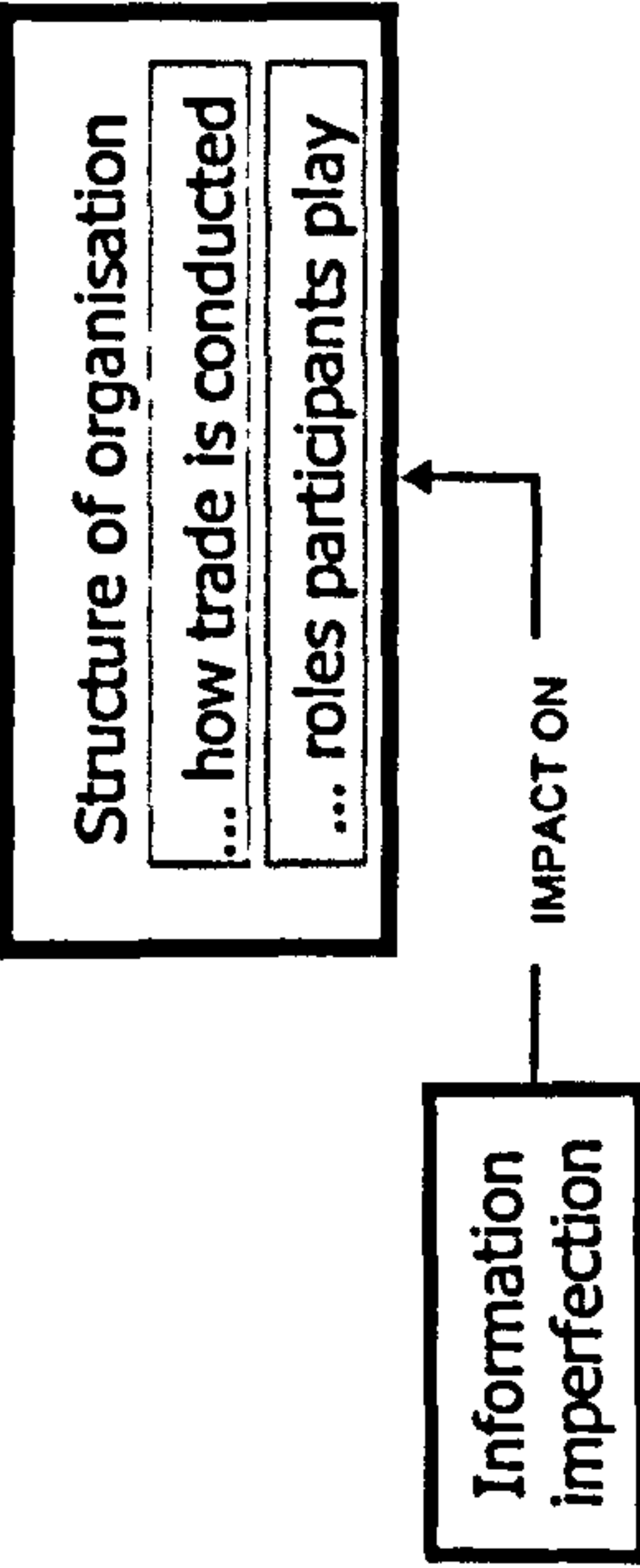
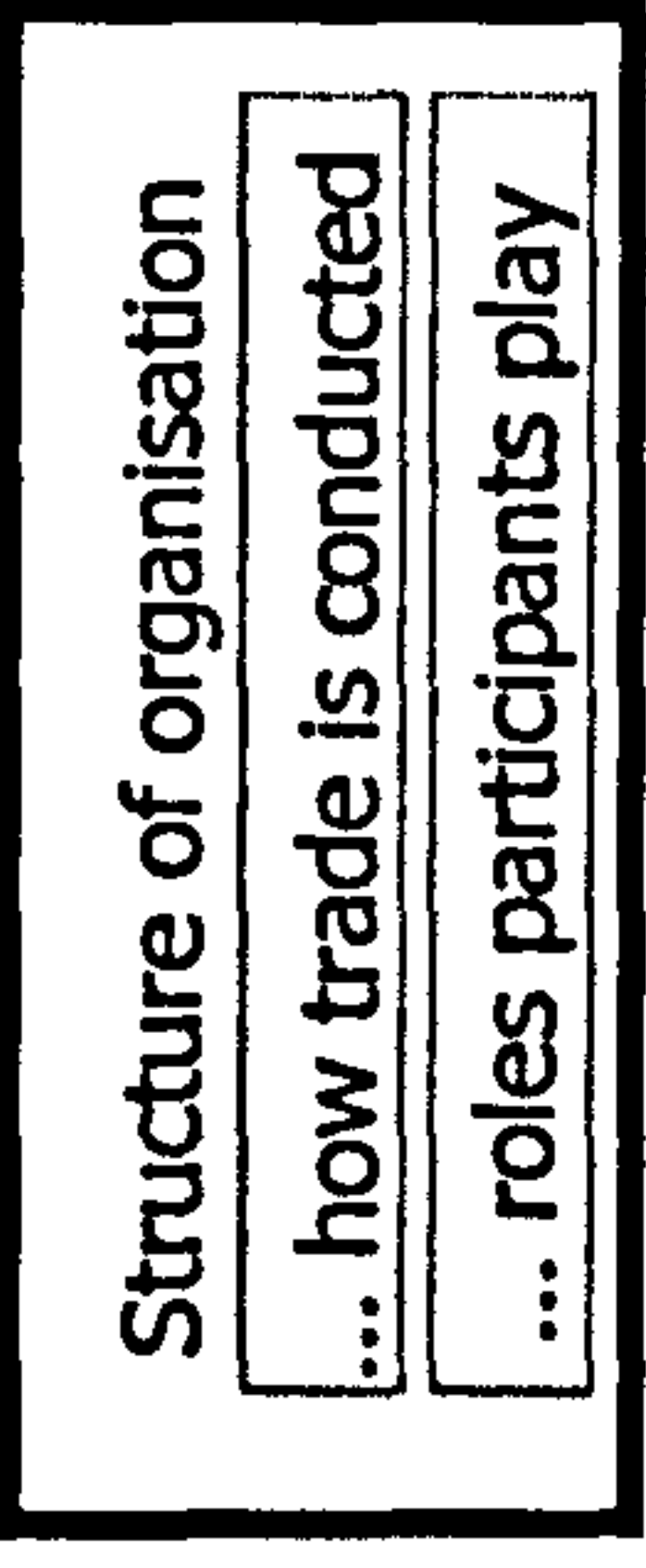
Code	Name and Description	Notes [where applicable]
RL POW	<p>as being present or absent [+/-].</p> <p>Causes and effects of such attraction are also tagged under this code [Cau/Eff].</p>	
FB	<p>Power relationships: displays of [likely to be predominately bargaining] power, in particular, imbalances are captured under this code.</p> <p>Firm behaviour: refers to the manner in which the organisational form being described/ studied operates or functions.</p> <p>There are three key sub-categories: the functioning and operation of roles, the manner in which transactions in the industry are structured, and [as yet] generic characteristics of the organisational form as a whole [RL/TXN/ ORG].</p>	
FB RLCMB	<p>Role combination: refers to instances in which an interviewee performs or has performed more than one of the role types identified [+/-].</p> <p>In instances where role combination is present [FB RLCMB/+], this code is used to identify when roles have been held concurrently or where there has been an evolution into different role types [CC/EV].</p>	
FB RLMIG	<p>Role migration: identifies the presence or absence of migration from one role to another [+/-].</p> <p>Where migration has not occurred [FB RLMIG/-], the code is used to assess whether or not it was desired [Dsr/UnW].</p>	<p>This code is very similar to RLCMB. As the occurrence of role migration is already captured under the code RLCMB+/EV, this code deals only with the absence of role migration.</p>
FB TXN INTG	<p>Value chain integration: this code identifies the presence or absence [+/-] of integration along the industry's value chain, and describes some characteristics where integration does occur.</p> <p>The permanence of the integration initiative described can be coded as permanent or temporal [Per/Tmp], and the direction of integration can be classified as being either vertical or horizontal [V/H].</p>	
FB TXN CRT	<p>Trade partner [selection/de-selection] criteria: refers to conditions used in deciding who to trade with [Sel] and who not to trade with [DeS] in the industry.</p>	

Code	Name and Description	Notes [where applicable]
FB TXN EXG	Type of exchange: provides a description of the type of exchange that occurs between the parties of a trade as being either discrete or relational [Dis/Rel].	In a theoretical sense, relational transactions [i.e. those of a recurring nature] can be further differentiated [into for e.g. hierarchies and networks]. However, some of this differentiation is captured in the FB TXN INTG code.
FB TXN COST	Transaction cost: identifies all incidences of costs associated with the transactions.	
FB ORG TRU	Trust: incidences and references that relate to trust or reflect trust-issues.	In relation to FB TXN EXG/Rel, participants in such exchanges tend to be connected by regular flows of information linkages that are based on high degrees of trust.
FB ORG OWN	Ownership: incidences and references that can be related to ownership of components and/or constituents of transactions.	This code can be used as a proxy for risk aversion. Differences in optimism and aversion to risk will result in variation in ownership [and as such variation in competence, resulting in the reinforcement of RL ADP. FB ORG OWN is also anticipated to have a relationship with FB TXN INTG.
FB ORG COMP	Competition: incidences and references that exemplify competitive behaviour.	This code relates to one of the assumptions of the study, that "competition among alternative economic organisations will in the long run select the most efficient arrangement". This code will also help determine the form competition in the industry takes.
FB ORG EFF	Efficiency: incidences and references that exemplify efficiency, and/or are as a result of competitive behaviour.	
GEO	Geography: this code is used to indicate incidences in which geography has an impact on components and/or constituents of transactions.	

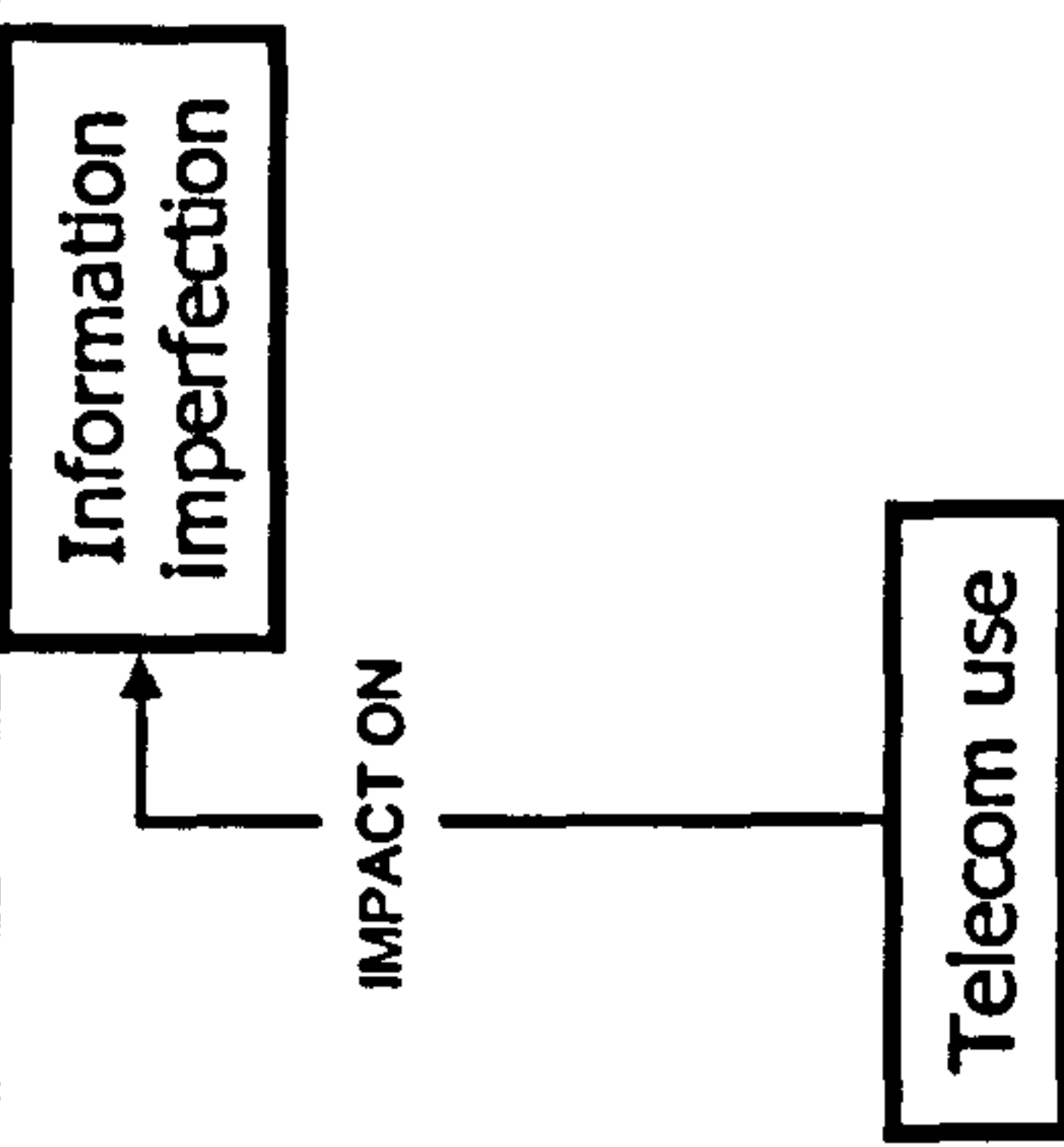
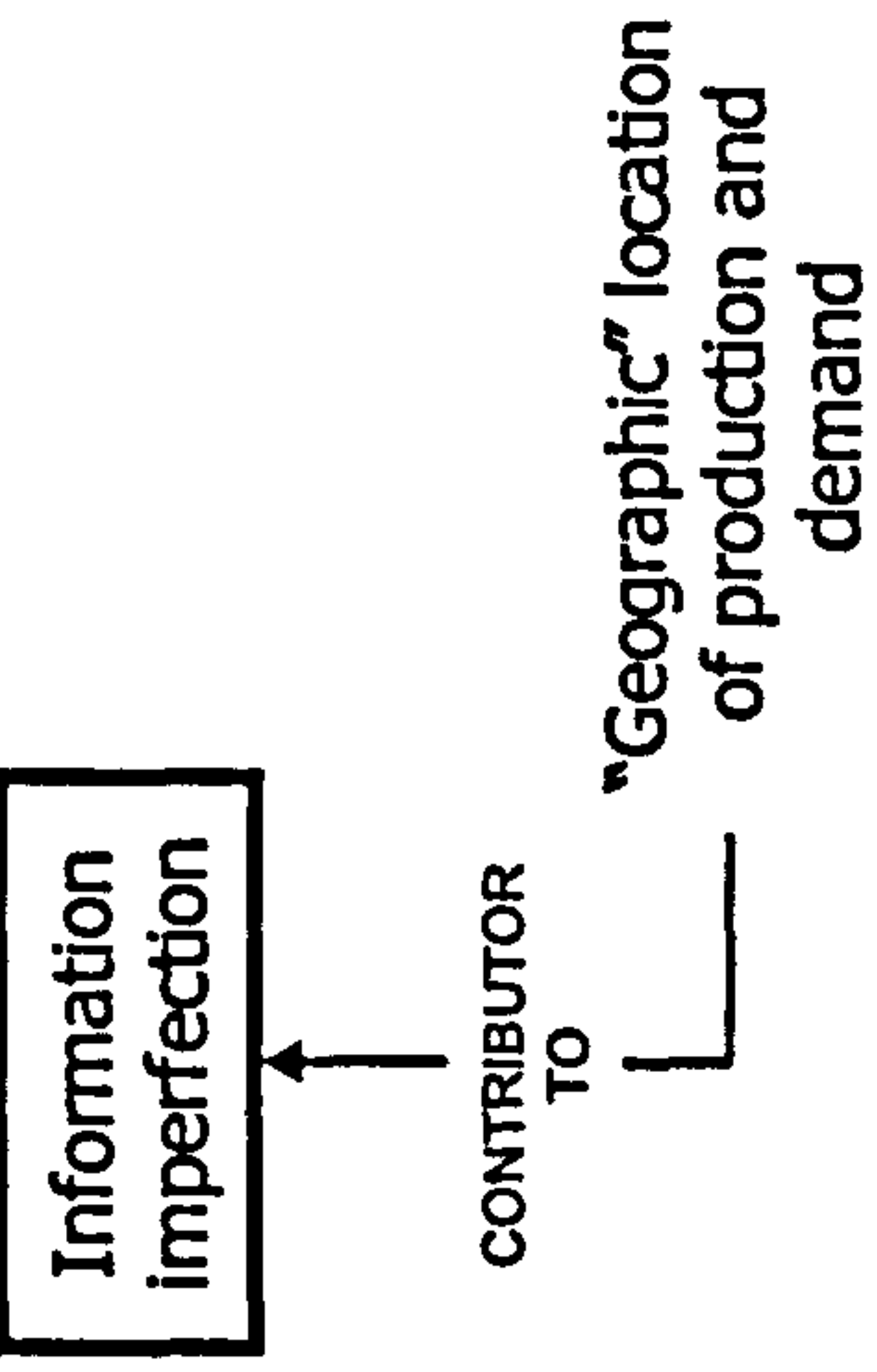
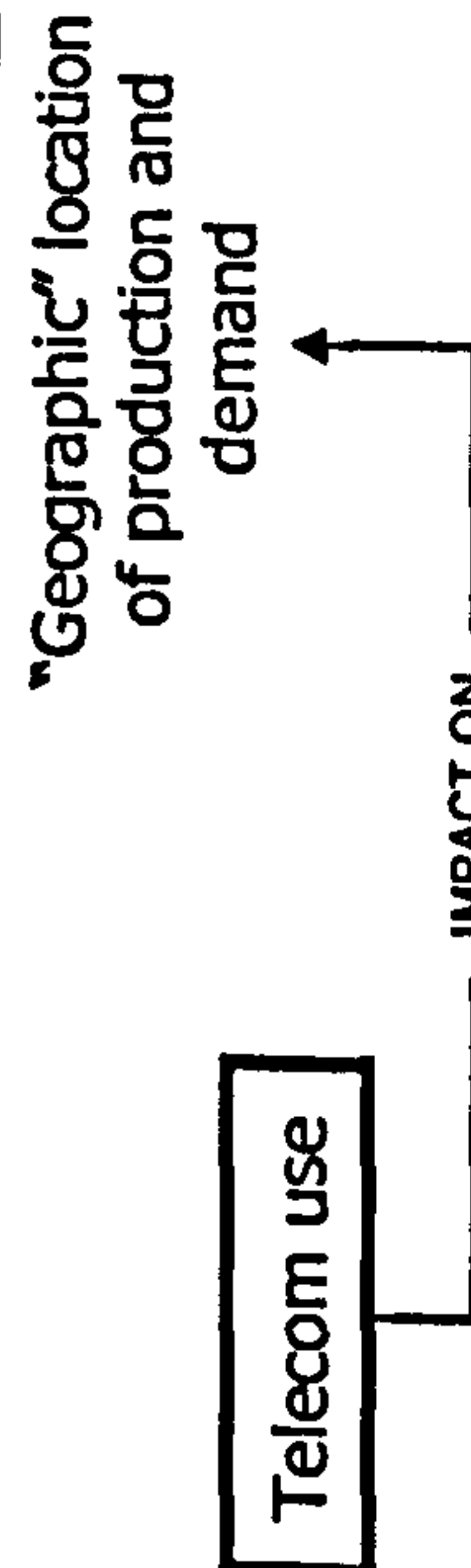
Code	Name and Description	Notes [where applicable]
GEO SPRD	Spread: identifies the presence [+] or absence [-] of geographic spread of parties and/or activities of transactions.	
GEO LOC	Location: defines location of participants in "absolute" or "relative" terms [Abs/Rel]. Where relative location refers to how "connected" a person is and absolute location, the geographic location of the individual in relation to other [actual/potential] partners in the transaction.	
GEO DIST	Distance: this code is used to separate occasions in which distance has an impact on communication from when it has an impact on transportation [Comm/Trans].	This code is useful in analysing intermediation in the industry. Intermediation is said to be more attractive when the impact of distance on transportation is less than its effect on communication.
GEO TERI	Territorial configuration: this code is used to label the entire grouping of activities associated with a transaction.	These configurations may refer to [new] groupings of production sites, distribution facilities and consumption spaces.
CTXN	Characteristics of transaction: this codes the characteristics of broad three aspects of transactions. The three aspects under investigation are the process of conducting the transaction; the [predominantly technical] techniques in use, and the decisions made [PRC/TEC/DEC]. Furthermore, each of the three aspects is coded in terms of being either idiosyncratic [unique to the interviewee] or uniform across the industry and/or role [Id/Uni]. Each aspect is also coded in terms of being motivated by and/or resulting in revenue generation or cost saving [Rev/Csv].	
INFO	Information: this code captures all references to information and its use.	
INFO ASYM	Information asymmetry: codes incidences in which one party to a transaction has more information than the other party. This code can be further broken down to identify causes of information asymmetry and its effects [Cau/Eff].	

Code	Name and Description	Notes [where applicable]
INFO DEF	Information deficiency: codes incidences in which none of the parties to a transaction has the required information.	
INFO COMM	Communication: codes the manner in which information is communicated between parties to a transaction. Can be either face-to-face or remotely [F2F/Rmt].	
INTMED	Intermediary activity: code used to identify all incidences of intermediary activity.	While market making and market clearing activities are mentioned in the conceptual framework, a general code is being used in other to capture as many forms of this type of activity as possible. These will be later sub-categorised.
INTMED CORD	Coordination: intermediation that specifically relates to coordinating will be further coded according to whether such activity involved the coordination of distance or activities [Dis/Act].	
TEL	Telecom use: codes for the presence or absence of the use of telecommunications [+/-].	

Appendix 8: Research suppositions, conceptual framework and a priori codes

SN _o	SUPPOSITION OF THEORETIC FRAMEWORK	RELEVANT PART OF CONCEPTUAL FRAMEWORK	APPLICABLE CODES
1.1	<p>Information imperfections create varying levels of instability in the market and trade relationships</p>		<p>INFO INFO ASYM INFO ASYM Cau INFO ASYM Eff INFO DEF</p>
1.2	<p>Organisational structure is a means of dealing with this instability.</p>		<p>FB TXN INTG FB TXN INTG Per FB TXN INTG Tmp FB TXN INTG V FB TXN INTG H FB TXN CRT FB TXN CRT Sel FB TXN CRT DeS FB ORG OWN FB TXN EXG FB TXN EXG Dis FB TXN EXG Rel FB ORG COMP FB ORG EFF FB ORG TRU</p>

SNo	SUPPOSITION OF THEORETIC FRAMEWORK	RELEVANT PART OF CONCEPTUAL FRAMEWORK	APPLICABLE CODES
2.0	<p>The types of information imperfections that are present in the market determine the intermediation activities that can be observed.</p>		<p>INTMED INTMED CORD INTMED CORD Dis INTMED CORD Act</p>
3.0	<p>Economic entities tend to always adopt the least cost structure [and/or mechanism] of conducting trade.</p>		<p>RL HRCY RL ATRC RL ATRC Cau RL ATRC Eff RL POW FB TXN COST</p>

SN _o	SUPPOSITION OF THEORETIC FRAMEWORK	RELEVANT PART OF CONCEPTUAL FRAMEWORK	APPLICABLE CODES
4.0	Telecommunications is a tool that is utilised in the reduction of information cost [and will as such be adopted by surviving/ dominant structures].		TEL
5.1	Geography has an impact on trade.		GEO GEO SPRD GEO LOC GEO LOC Abs GEO LOC Rel GEO DIST GEO DIST Comm GEO DIST Trans GEO TERI
5.2	Telecommunications is a tool through which the impact of geography can be managed.		INFO COMM INFO COMM F2F INFO COMM Rmt

Appendix 9: List of Attributes

ATTRIBUTE	VALUES	A PRIORI CODE
Combination of Roles Indicates if interviewee performs more than one role in the industry and if roles are performed concurrently or at disparate times	Unassigned	FB RLCMB
	Unknown	FB RLCMB +
	Not Applicable	FB RLCMB +/-CC
	Absent	FB RLCMB +/-EV
	Present Concurrent	FB RLCMB -
	Present Disparate	
Description of Location⁸⁷	Unassigned	None
	Unknown	
	Not Applicable	
	Urban	
	Sub-Urban	
	Rural	
Gender	Unassigned	None
	Unknown	
	Not Applicable	
	Male	
	Female	
How Trade Skills Acquired Used to describe the rationale behind the take up of a particular role. Whether it was as a result of lineage or not	Unassigned	RL ADP
	Unknown	RL ADP Ind
	Not Applicable	RL ADP Nat
	Lineage	
	Non-Lineage	
Migration into Present Role Identifies if interviewee has always performed role or has migrated from one role to another within the industry or from another profession	Unassigned	FB RLMIG
	Unknown	FB RLMIG +
	Not Applicable	FB RLMIG -
	No	
	Yes within Industry	
	Yes other profession	
Role The industry role category the interviewee belongs to	Unassigned	RLID
	Unknown	RLID WVR
	Not Applicable	RLID INTMED
	Buyer	RLID BYR
	Intermediary Reseller	

⁸⁷ Incorporating various Internet dictionary definitions; a suburban area is described as - the area around a city. Suburban areas are generally characterised by low-density residential development and limited commercial uses.

ATTRIBUTE	VALUES	A PRIORI CODE
	Intermediary Designer	
	Weaver Vertical Loom	
	Weaver Horizontal Loom	
Telephone Access	Unassigned	TEL
	Unknown	TEL +
	Not Applicable	TEL -
	Own Telephone	
	Tele-Centre	
	No Access	
Trade Location Geographic location of interviewee's [main] business operation - shop or workshop	Unassigned	None
	Unknown	
	Not Applicable	
	Lagos	
	Ibadan	
	Ijebu-Ode	
Work Status Describes the work status of the interviewee in the industry and is based on the work location of the interviewee	Unassigned	RL WKSTAT
	Unknown	RL WKSTAT Idg
	Not Applicable	RL WKSTAT Mig
	Migrant	
	Emigrant	
	Indigene	

Appendix 10: List of NVivo Nodes

Nvivo NODES	A Priori Codes [where applicable]
<u>FREE NODES:</u>	
Barrier	
Benefits of Telecoms	
Descaling of operation	
Disappoint	
Impatience	
Innovation	
Mobility	
Price	
Stress	
Success Factors	
Survival	
Use of Fabric	
Who you are	
Word-of-mouth	
<u>TREE NODES:</u>	
Role Hierarchy	RL HRCY
Attractiveness of Role	RL ATRC
/ Attractiveness of Role/Causes	RL ATRC Cau
/ Attractiveness of Role/Effects	RL ATRC Eff
Power Relationships	RL POW
Firm Behaviour	FB
/Firm Behaviour/Value Chain Integration	FB TXN INTG
/Firm Behaviour/Value Chain Integration/Permanent	FB TXN INTG Per
/Firm Behaviour/Value Chain Integration/Temporal	FB TXN INTG Tmp
/Firm Behaviour/Value Chain Integration/Vertical	FB TXN INTG V
/Firm Behaviour/Value Chain Integration/Horizontal	FB TXN INTG H
/Firm Behaviour/Trade Partner Criteria	FB TXN CRT
/Firm Behaviour/Trade Partner Criteria/Selection Criteria	FB TXN CRT Sel
/Firm Behaviour/Trade Partner Criteria/De-selection Criteria	FB TXN CRT DeS
/Firm Behaviour/Ownership	FB ORG OWN
/Firm Behaviour/Cost of Transaction	FB TXN COST
/Firm Behaviour/Type of Exchange	FB TXN EXG
/Firm Behaviour/Type of Exchange/Discrete	FB TXN EXG Dis
/Firm Behaviour/Type of Exchange/Relational	FB TXN EXG Rel
/Firm Behaviour/Competition	FB ORG COMP
/Firm Behaviour/Efficiency	FB ORG EFF
/Firm Behaviour/Trust	FB ORG TRU
/Firm Behaviour/Trust/Violations of Trust	
Geography	GEO
/Geography/Geographic Spread	GEO SPRD
/Geography/Definition of Location	GEO LOC

Nvivo NODES	A Priori Codes [where applicable]
/Geography/Definition of Location/Absolute	GEO LOC Abs
/Geography/Definition of Location/Relative	GEO LOC Rel
/Geography/Impact of Distance	GEO DIST
/Geography/Impact of Distance/Communication	GEO DIST Comm
/Geography/Impact of Distance/Transportation	GEO DIST Trans
/Geography/Territorial Configuration	GEO TERI
/Geography/Space	
/The Way Trade is Conducted	CTXN
/The Way Trade is Conducted/Idiosyncratic	CTXN Id
/The Way Trade is Conducted/Idiosyncratic/Processes	CTXN Id PRC
/The Way Trade is Conducted/Idiosyncratic/Techniques and Skills	CTXN Id TEC
/The Way Trade is Conducted/Idiosyncratic/Decision Making	CTXN Id DEC
/The Way Trade is Conducted/Uniform across Role	CTXN Uni
/The Way Trade is Conducted/Uniform across Role/Processes	CTXN Uni PRC
/The Way Trade is Conducted/Uniform across Role/Techniques and skills	CTXN Uni TEC
/The Way Trade is Conducted/Uniform across Role/Decision Making	CTXN Uni DEC
/The Way Trade is Conducted/Revenue Generating	CTXN Rev
/The Way Trade is Conducted/Cost Saving	CTXN Csv
/Information	INFO
/Information/Information Asymmetry	INFO ASYM
/Information/Information Asymmetry/Causes	INFO ASYM Cau
/Information/Information Asymmetry/Effects	INFO ASYM Eff
/Information/Information Deficiency	INFO DEF
/Information/Method of Communication	INFO COMM
/Information/Method of Communication/Face2Face	INFO COMM F2F
/Information/Method of Communication/Remote	INFO COMM Rmt
/Information/Sharing	
/Intermediation Activity	INTMED
/Intermediation Activity/Coordination	INTMED CORD
/Intermediation Activity/Coordination/of Distance	INTMED CORD Dis
/Intermediation Activity/Coordination/of Activities	INTMED CORD Act
Characteristics of Telecoms	TEL

Appendix 11: Matrix Construction and Analyses

Example using the Information Imperfection variable of the conceptual framework

The Information Imperfection variable of the conceptual framework refers to the following research suppositions:

1.1 Information imperfections create various levels of instability in the market

2.0 The types of information imperfections that are present in the market determine the intermediation activities that can be observed

The matrix constructed therefore provides insight into the validity of these suppositions. The NVivo analytical function utilised for this analysis is called “Union” and the decision rules – i.e. how ratings or judgements were arrived at, the basis for selecting particular quotes, and how reports from different respondents were balanced out – that were used are as follows:

Step One: Creation of “Union” of “Information” sub-tree:

- a. As can be seen from the list of codes (refer to Appendix 7) several codes were created to capture different aspects/characteristics of information that were observed in the data. This step aggregates all text to which these codes have been applied under a universal “information” node. In this step:
- b. NVivo searched through all of the documents in its database and makes copies of all texts coded by any of the nodes⁸⁸ that constitute the “Information” sub-tree (refer to Appendix 7 for list of these nodes).
- c. These texts were copied into a new node which was named ‘Information Imperfection’.
- d. Contents of Information Imperfection node were then reviewed to ensure that only references to instances of imperfect information were

⁸⁸ It should be recalled that codes are referred to as nodes in NVivo.

included. Texts that did not relate to instances of imperfect information were removed.

- e. Duplications were retained in that similar descriptions of and/or responses to imperfect information by participants performing the same role were individually listed (instead of being summarised into one entry).

Step Two: Creation of Information Imperfection and Intermediary Activity

“Co-occurrence”⁸⁹ matrix:

In this step:

- a. NVivo searched through all of the documents in its database and finds instances where the information imperfection code and any of the codes that make up the intermediary activity sub-tree⁹⁰ were applied to the same paragraph/section of text.

Step Three: Creation of Information Imperfection and Intermediary Activity thematic matrix:

- a. Using the result of the co-occurrence matrix in step two, a matrix with column title “Information Imperfection” and rows with titles of codes that constitute the intermediary activity sub-tree, was created. Each cell of the matrix contains portions of coded text taken directly from the data (see Table 17 for example).
- b. The data was also transformed at this stage in that in listing the descriptions and responses of participants, names and other identifiers of the individual were removed and replaced with identifiers of their role in the industry. Thus rather than state that Mrs X reported something, the role of the respondent (for example “intermediary”) was used instead. This was done to aid the analysis of the impact of

⁸⁹ A co-occurrence (or near) search is a type of proximity search in NVivo.

⁹⁰ Codes that make up sub-trees are all listed in Appendix 7

information imperfections on the roles participants play in the industry. Furthermore, whilst the researcher is aware of the identity of the participants in the study and the role played by each of them, other people reading the report are not and would therefore be unable to identify how perceptions and responses differ across roles. To further facilitate this type of analysis and in instances that there is nothing in the content of a quote to identify who is speaking, the role of the respondent was also stated in brackets at the start of such quotes. For example

[*Weaver speaking*] A deposit of 75% or full payment is then obtained from the buyer. The deposit money must cover the purchase of “thread” for the order and payment to weavers in the workshop that will be working on the order.

Table 17: Section of Information Imperfection and Intermediary Activity thematic matrix

Matrix Nodes	Information Imperfections
Intermediation Activities	<p>[the intermediary] currently deals with only one [vertical weaver who is based in Agege, Lagos and] who moves between different intermediaries collecting orders.</p> <p>pattern/designs [of vertical loom weavers] were just coming into the market and as such these weavers are not well aware of fashion. They [vertical weavers] tend to need a lot of guidance and make a lot of mistakes.</p> <p>Vertical weavers do not train or teach people their skill, theirs is considered to be an inborn ability and this may explain the variation that occurs in their products.</p> <p>In cases where customers come with their own designs, [the intermediary's] main function is to give advice, especially on colour combinations. Input by weavers on colour combinations and design patterns are also incorporated into the design process.</p>

Co-occurrence and thematic conceptual matrices were also created using the ‘Information Imperfection’ node and ‘The Way Trade is Conducted’ sub-tree; as well as using the ‘The Way Trade is Conducted’ and ‘Intermediary Activities’ sub-trees. All matrices were then examined and merged to

acquire an understanding of the information imperfections seen occurring in the case, the instability generated by such imperfections, and the intermediation activities carried out as a result.

This understanding was also presented using a matrix format with the following as column headings:

- a. "Information Imperfection" - under which the type (sub-type) of imperfection is identified;
- b. "Description" - under which quotes from participants describing the imperfection are listed; and
- c. "Response" - which describes the way in which participants deal with such imperfections (if at all).

An extract of this matrix is presented in Table 18 below:

Table 18: Section of Information Imperfection Matrix

RELEVANT SUPPOSITIONS OF THE CONCEPTUAL FRAMEWORK

- 1.1 Information imperfections create various levels of instability in the market
- 2.0 The types of information imperfections that are present in the market determine the intermediation activities that can be observed

Information Imperfection	Description	Response
1. Volatility of the thread market	This is a recurring theme that influences amongst other things the quality of output [fabric] as well as makes or breaks relationships between different parties in the industry.	
[i] The specific colour of thread required for an order will not be available in the market for the duration of the order fulfilment process	<p>[Intermediary speaking] The market for thread is well known for its volatility, in the sense that shades of a particular thread often run out in short periods of time</p> <p>[The buyer] mentioned that other people's experiences when ordering in large quantities were that the initial products were good but as the numbers increased, the colour of the thread would begin to change.</p>	<p>...For this reason it is often desirable to buy all the raw materials [in particular thread] required for the order.</p> <p>[Intermediary speaking] It is ...necessary to buy the thread in bulk so that it does not run out during the course of producing the order, increasing the likelihood of colour inconsistencies, as it cannot be guaranteed that the same shade would still be available in the market.</p>

Information Imperfection	Description	Response
	<p>... [weavers] do not buy sufficient amounts of thread at the start of the order and have to return to the market mid way through the order ...often, the particular colour of thread being used is no longer available...</p>	