

# **Determinants of Inter-firm Networks in Kenya**

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## **Abstract**

*The small firm sub-sector has the potential to reduce poverty and unemployment in Kenya. However, in the face of global competition, market uncertainties and rapid technological changes, it is necessary to assist small enterprises to access information that can build their business competencies. This study applies descriptive and analytical methods to a stratified random sample of 71 enterprises in Nakuru Town to examine how firms use networks as information channels. A logit model is estimated to explain information-seeking behaviour of enterprises whereas an OLS regression model traces the extent to which entrepreneurs and enterprises influence network formation. The study establishes that various types of inter-firm networks exist among manufacturing enterprises in Kenya. However, small businesses have weak inter-firm networks, relations that are crucial in overcoming the market, material and credit constraints. Further, the study shows that the size of the enterprise, previous entrepreneurial experience and level of education of owner-managers positively influence the choice of inter-firm networking. The study thus recommends incentive mechanisms that encourage sub-contracting networks between small and large enterprises. Nevertheless, the findings need to be re-examined using more comprehensive data that captures effects of macro environment on inter-firm networks, for conclusive policy options to be drawn.*

## **Abbreviations and Acronyms**

BDS	Business Development Services
ICEG	International Centre for Economic Growth
KAM	Kenya Association of Manufacturers
KCB	Kenya Commercial Bank
KEPSA	Kenya Private Sector Alliance
KIE	Kenya Industrial Estate
K-MAP	Kenya Management Assistance Programme
KNNCI	Kenya National Chamber of Commerce and Industry
OLS	Ordinary Least Squares

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## **1. Introduction**

### **1.1 Background of the Study**

The main economic challenges in Kenya today are unemployment and high incidences of poverty. The government estimates that the country has more than two million unemployed people with about 492,000 new entrants into the labour market every year (Government of Kenya, 2003). With monthly poverty lines per adult equivalent in rural and urban areas estimated at Ksh 1,562 and Ksh 2,913, respectively, 48 per cent of Kenyans are poor (Government of Kenya, 2007). The Government of Kenya has put in place strategies to overcome these problems as articulated in the various policy documents, namely the Sessional Paper No. 2 of 1997 on Industrial Transformation to the year 2020, the National Poverty Eradication Plan (1999-2015), the Economic Recovery Strategy for Wealth and Employment Creation (2003-2007), National Industrial Policy (2007) and Kenya Vision 2030.

It is expected that the small enterprise sector will be the major source of new jobs in Kenya (Government of Kenya, 2005). The sub-sector employs nearly 6.8 million Kenyans and of the new jobs created in 2006, 89.1 per cent were absorbed in small firms (Government of Kenya, 2007). Micro and small enterprises also generate as much as 12 per cent of the country's manufacturing value added (Government of Kenya, 2007). Research has shown that small enterprises growth can lead to rapid industrial transformation, as is the case with South East Asian economies (Kimuyu and Omiti, 2000).

However, a policy issue that arises in Kenya is whether small enterprises have the potential to reduce unemployment and alleviate poverty. The proliferation of small enterprises in Kenya may not be the end product of entrepreneurial traits within the individuals involved. A general observation shows that there is an increasing number of emerging informal enterprises which, in most cases, stem from the need to escape from joblessness and starvation facing the desperate and unemployed people in Kenya. Most small enterprises, particularly in manufacturing, require some levels of managerial and technical skills that majority of school-leavers lack. Further, the high mortality rate of new businesses and slow enterprise creation and growth raises concerns of lack of entrepreneurial skills and culture among the operators of small enterprises. As Casson (1995) asserts, entrepreneurial culture impacts on the transaction costs and consequently affects a firm's performance.

Indeed, since an entrepreneurial culture is complex and specific, a firm (or an individual) enriched with it possesses competitive advantage. Where an entrepreneurial culture is weak, enterprise performance and growth can be promoted through provision of business support services.

Availability of business support services may motivate entrepreneurs to learn the necessary skills and knowledge. However, the donor-supported business development services have had little impact on enterprise performance and growth in Kenya. Over the period 1995-1999, only 7 per cent of small enterprises had benefited from these services (Government of Kenya & ICEG, 1999). The minimal impact of these efforts suggests that a new approach to offer business support is necessary.

As Graeme (1996) puts it, there is more than just lack of finance, skills and demand that negate enterprise growth among Africans. The businesses non-African entrepreneurs have, comparably, exhibited better economic performance despite the fact that they face similar problems with those owned by Africans. This is largely attributed to structural problems inherent in African-owned firms, which lead to weak indigenous industrial entrepreneurship that is demonstrated by virtual absence of modern African small-scale industrial sector (Lall, 1995). Past efforts to ameliorate the macro environment in Kenya have not necessarily resulted in higher entrepreneurial growth. Assuming that better macroeconomic conditions and physical infrastructure are sufficient to spur industrial development may be misguided since industrial progress requires a package of incentives, capabilities and institutions (Lall, 1990). A strong indigenous entrepreneurial class can be realized if the emerging firms develop new skills, source new information and establish organizational structures that improve their capabilities.

The relatively better performance of non-African Kenyan entrepreneurs can be traced to tightly protected and exclusive business networks that are formed to promote Asian-owned businesses (McCormick and Pedersen, 1996; Kimuyu, 2000; Collier and Gunning, 1997). Similarly, as Barr (1998) and Fruin (1994) observe, firms in developed countries are characteristically highly integrated with networks that facilitate exchanges and improve access to resources, markets and technology.



Therefore, inter-firm networks can potentially facilitate information dissemination on innovations, markets and resource inputs, and also enhance exchange by lowering transaction and adaptive costs. There is a dearth of research on relational patterns across firms and industries in Kenya and factors that influence the formation of these information gathering structures.

Do such firms' networks exist in Kenya and what contributes to their formation? These are the issues analyzed in this paper.

### **1.2 Purpose of the Study**

The purpose of this study was to analyze the nature of networks that characterize information channels between firms and find out the factors that facilitate the formation of these networks. Specifically, the study:

- (i) Identified the nature of inter-firm networks existing among firms in Kenya; and
- (ii) Determined the factors that influence inter-firm networking.

### **1.3 Operational Definitions**

Whereas the terms *firm* and *enterprise* are used interchangeably in the study, they do not necessarily have the same meaning. In economic theory, the firm is taken as a single consistent decision-making unit in respect to production and sale of a product. However, the term enterprise conventionally refers to establishment of commercial and/or industrial undertaking that generates employment and income. Thus, an enterprise can have more than one firm. Since the study focuses on production and marketing activities in the manufacturing sector, the enterprises analyzed in the study are one-product entities with or without a range of by-products. Hence, the enterprise is, in this case, synonymous with a firm in regard to its operations. Similarly, terms such as *micro*, *small*, *medium* and *large* firms tend to be used to define firms in different sizes. For this study, focus is on firms with less than fifty employees, which in this paper are referred to as small firms.

In ordinary usage, the term *inter-firm network* acquires slightly different meaning depending on the context in which it is being used. Any business exchange requires minimization, cooperation and transactional problems related to information asymmetry. To reduce

the inherent transaction costs, some medium or an arrangement that emphasizes interactions of individual to individuals, individuals to institutions and institutions to other institutions is created. It is this purposeful arrangement of interactions between firms that is referred to as *inter-firm networks*. These networks act as information multipliers and allow firms to improve their competencies while still retaining their separate legal and economic identity.

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## **2. Firms Growth and Inter-firm Networks**

Inter-firm relations are possibly linked to constraints that face firms that are mostly informational. To explore the nature of networks existing within industrial establishment in Kenya, we start with a review of the sector's contribution to employment creation and income generation, and thereafter analyze how inter-firm networks minimize firms' growth constraints as information channels.

### **2.1 Profile of Small Firms in Kenya**

There is a significant body of literature on the role of small enterprises on employment creation and income-generation in an economy (Fafchamps, 1994; Mead, 1994; Lall, 1995; IPAR, 2002). Small enterprises are a seedbed for rapid industrial transformation. They provide training ground for acquisition of managerial and technical skills required for development of capabilities for industrial process. Therefore, small enterprises nurture entrepreneurship, which is a driving force that can push developing economies from low-growth trap. The labour intensity of small firms not only promotes equitable income distribution but also alleviates the burden of poverty prevalent in many developing countries, as majority of urban poor derive their livelihood by engaging in small-scale industrial activities. Small firms indirectly promote agricultural development in Kenya since farming communities provide market for products of the small-scale industrial sub-sector. The attempts by the Kenyan government, as reflected in various policy documents, to improve the regulatory environment of small enterprises further underscores its appreciation that small enterprises are central in reducing unemployment and poverty (Government of Kenya, 1989; 1992; 2003).

Substantial research has also been done to identify growth barriers facing small enterprises (Felsenstein and Schwartz, 1993). They include: inaccessibility of financial services, technical and management skills deficiencies, dilapidated infrastructure and increasingly volatile input and output markets. The research works of Webster and Steel (1991), Osei *et al* (1993) and Boah-Nuakoh (1993), cited in Bigsten and Kimuyu (2002), indicate that lack of access to credit, poor managerial skills and under-developed technology capabilities are the major constraints for small firms. Within the industrial context in Africa, not only are markets small, but also too fragmented (Lall, 1995) to sustain any meaningful

transformation of emerging firms. In addition, the overall industrial development suffers operational inefficiency and lacks dynamism in terms of raising resource productivity, increasing exports and diversifying products. These industrial development lags partially stem from structural problems within the firms: lack of investment capabilities—skills to identify and evaluate projects; ability to buy the plant and maintain it locally; and ability to redesign and develop the technology to make it appropriate for local needs. Thus, efforts to improve the performance of small enterprises are necessary to spur industrial development in Africa.

Given that small firms face serious constraints despite their potential contribution to a country's economic development, a number of studies (Liedholm and Chuta, 1976; Child, 1977; Bigsten and Kimuyu, 2002) have attempted to explain factors that determine the growth of a firm. Liedholm and Chuta (1976) associate a firm's growth with the firm's age and better managerial skills, whereas entrepreneur's level of education correlates negatively with a firm's profitability. The latter observation is, however, contradicted by Bigstern and Kimuyu's (2002) study that found a positive relationship between literacy and technical skills in a firm's growth. Child (1977) suggests that previous entrepreneurial experience negatively influences the growth of a firm.

Despite the substantial research attention given to factors that constraint a firm's growth, little concern has been paid to the policy interventions that can improve a firm's internal competences to overcome the constraints. The central theme of this study rests on the premise that growth variables, embodied in a firm's capability to access relevant business information may be generated from a firm's networks with other key players in the economy. Consequently, the acquisition of business competences as growth variables helps the firm to overcome growth constraints. The enterprise characteristics and entrepreneur attributes possibly influence the nature and degree of the inter-firm relationships that emerge.

## **2.2 Use of Inter-firm Networks as Information Channels**

In response to the necessity to reduce growth constraints facing small enterprises, a number of non-governmental organizations offer Business Development Services (BDS) comprising standardized training and technical assistance to small firms. However, the evidence adduced so

far has shown little positive impact of these programmes (Government of Kenya & ICEG, 1999). There is a possibility that these programmes are not geared to specific needs of the enterprises at their growth stage, or small enterprises may not be aware of the opportunities available for support services. There is need to inquire why these supply-driven service programmes are not effective in transforming small enterprises in Kenya.

Demand-driven development strategies can be effective in facilitating industrial performance in developing countries (Tendler and Amorim, 1996). The experiences of the Japanese automobile industry (Fruin, 1994), the industrial districts of North Italy (Schmitz, 1995), and the public procurement-drive of small enterprises in California, United States (Saxena, 1994) suggest that institutional arrangements of firms' interrelationships enhance industrial growth in a country. Inter-firm network dynamism can be comparable to what Macharia (1988) calls the social network; the ethnic linkage that acts as a network for timely information flow, apprenticeship, training and trust building. But inter-firm network operates beyond social networking since it is a mechanism that defines the framework for interactions between business agents where contractual rules and relational norms are set (Kimuyu and Omiti, 2000). The increasingly sophisticated ways of information flow, product and technology choice transcend the influence of ethnic identity on business opportunities and access to relevant resources and skills.

Inter-firm networks play a central role in disseminating information, facilitating collective action and lowering transaction costs. A typical case is that of the Japanese enterprise system where inter-firm cooperation and collaboration through networks and alliances has radically altered the corporate organization in Japan (Fruin, 1994). A firm can remain small but competitive at global level. For instance, Japanese firms are comparably small and more specialized relative to leading industrial firms in America and Europe. The industrial growth in Japan is based on high productivity, adaptability of the manufacturing set-up and emphasis on specialization. These aspects are made possible through an industrial organization encompassing factory, firm and inter-firm networks that define a firm's interdependence and relational interactions. At manufacturing (factory) level, there is product and process specialization that focuses on functional excellence. Corporations (firms) develop manufacturing and marketing strategies, coordinate smooth flow of information between factories, as well as corporate strategic planning. Factories make and sell products in conjunction with the corporations. Factory-based enterprises are kept

small and specialized with a long-term strategy of cooperation to overcome specialization shortcomings.

Similarly, Hong Kong's rapid economic growth can be attributed to adaptive entrepreneurship where firms remain alert to business opportunities and respond with a high degree of flexibility and adaptability (Fu-Lai Yu, 1998). Firms respond to new market niches because they are typically small, with smaller overheads and low shifting opportunity costs. The firms' flexibility is enhanced by forming sub-contracting networks, which also assist small factories (firms) by providing technical advice, product design, marketing and securing loans. This form of sub-contracting is even extended to international dealings where Hong Kong manufacturers produce according to the requirements of orders from overseas companies.

Another aspect of business growth where networks can facilitate efficiency is in contract enforcement (Fafchamps, 2001). Any exchange requires availability of necessary information to avoid problems of cooperation and coordination. Given the high costs of enforcing contracts through state agencies such as the courts, small firms may lower transaction costs through networks that emphasize business norms to discourage opportunistic behaviour.

Inter-firm networks and interdependence thrive on the firms ability to specialize. Organizational learning may enhance specialization at intra-firm level through polished product/process specification and at inter-firm level where a firm can tap organizational capabilities of other firms to avoid shortcomings of specialization, that is, narrow scope and market incompetence (Fruin, 1994).

### *2.2.1 Interventions to promote inter-firm relationships*

Firms tend to evolve as independent and atomistic entities. European and American firms emphasize corporate image of an enterprise where strategies to achieve competitive edge are individually pursued. Policy set-ups in Kenya seem to have encouraged firms to adopt this corporate form of business organization. However, the experience of Japanese enterprise system and other East Asian countries illustrates that collaboration and cooperation are complementary to business competition.

Recent studies show that strong inter-firm linkages, similar to those in Japan or Hong Kong, hardly exist in developing countries (Fruin, 1994; Galhardi, 1995; Schmitz, 1995). One way of enhancing inter-firm innovative cooperation and technological dynamism is to create institutional arrangements that encourage firms to establish interactive networks. Evidence and effectiveness of such initiatives can be found in revitalized associations of small auto-parts firms in Argentina and export agency of 25 manufacturing small firms in Chile (Galhardi, 1995). The government can also facilitate sub-contracting networks through legislation and provision of database as is the case in India (Levitsky, 1983). Such programmes assist the firms to have flexible networks that establish contacts and support structures in a participatory manner.

In retrospect, it may be time we agree with Molenaar (1983) that the small entrepreneur “really does know how” to go about solving his/her own problems and the best that should be done is to create a matching mechanism of the strong points of the entrepreneur and the enterprise with available assistance opportunities. However, instead of assigning that role to an industrial extension officer as advocated by Molenaar, individual firms may get assistance from the networks, as participatory forums, in analyzing their unique problems and prospects.

### *2.2.2 Institutional support to inter-firm networks in Kenya*

There are a number of organizations that can influence firm-firm linkages in Kenya. The Kenya National Chamber of Commerce and Industry (KNCCI) can potentially facilitate business support and networking given its membership of small and large firms and its international recognition. The chamber was initially created to act as a focal point and link centre between both local and foreign firms by receiving and disseminating information, organizing and coordinating international fares, offering consultancy services to members and facilitating joint ventures and other collaboration. However, leadership wrangles and allegation of corruption have weakened the management of KNCCI. Chambers of commerce and industry can be instrumental in strengthening joint ventures and availing data on market avenues. The performance of KNCCI contrasts with the success of Kenya Association of Manufacturers (KAM), which links the industrialists in dialogue and creates an understanding with the government. Indeed, KAM has given significant input in the formulation of policies on energy, industrialization and environment.

In addition to KNCCI and KAM, there are other few institutions that promote firm-firm networks in Kenya. The Kenya Private Sector Alliance (KEPSA), an apex body for private sector associations, has lobbied the government to incorporate views from private sector in public policy formulation. The Kenya Management Assistance Programme (K-MAP) originally brought together large companies willing to assist small businesses by providing training and business counseling. However, K-MAP's recent activities are centred on micro finance and banking services. The General Motors (Kenya) has strategic alliance and sub-contracting relationship with 80 firms, mostly employing 5-19 people, who supply components, parts, and services.

The extent to which the above initiatives have impacted on improving the competitiveness of small firms is not clear. There is need to document the contribution of these firms' initiatives and establish learning lessons. It is also not clear whether the initiatives, such as that of General Motors, are part of the firms' social responsibility. Therefore, the firm may shift its focus from these initiatives in future.

In the banking sector, a number of commercial banks have new products tailored for small-scale activities and have incorporated networking arrangements between firms. Barclays Bank and Kenya Commercial Bank, for example, have Barclays Business Club and KCB Biashara Club, respectively. The clubs provide opportunity for firms to create business partnership and alliances in business forums. It can be expected that other commercial banks will institute similar initiatives as more banks tailor unique products to small firms.

Part of the services that Kenya Industrial Estates (KIE) is expected to offer to small enterprises is to facilitate linkage between small and micro enterprises and medium and large scale enterprises. KIE was to achieve this through a programme involving provision of short term working capital loan, training on quality assurance, certification, process re-engineering and cleaner production and technology transfer. However, KIE has had no tangible achievements in this regard.



### **2.3 Relationship between Inter-firm Networks and Enterprise Performance**

Information-accessing capabilities of firms minimize the transaction and adaptive costs that firms face. Inter-firm networks enhance business competences to minimize these costs, and therefore improve enterprise performance. Better enterprise performance may be perceived in form of good sales, high production or even enlarged business establishment. Inter-firm networks can facilitate enterprise performance by enabling the firms to achieve economies of scale, transaction costs and also positive externalities.

*Economies of scale:* Firms can potentially increase production at lower average costs if there are positive developments in capital investment, acquisition of production inputs and technological progress. However, market uncertainty and organizational limits (firm-specific capabilities to exploit technological advance and interpret/respond to market indicators) may inhibit the firm's effectiveness in achieving economies of scale. Inter-firm networks help firms to enhance organizational learning (firm-specific capacity to use knowledge) and acquire new channels of information flow, thus minimizing the problem of adverse selection. For instance, sub-contracting networks gives scale benefits, while sub-contracted small enterprises acquire markets for their products in addition to technical and managerial training.

*Transaction cost economies:* The administrative procedures of the transaction have a cost element, which can be reduced (transaction cost economies) if adjustments are made in organizational structures, routines and practices. Inter-firm networks provide intermediating services between firms participating in a business transaction. For instance, firm-firm networks can potentially assist a firm to easily identify suppliers and quality of inputs. Further, the use of networks as referrals enhances the firm's capacity to rationalize product quality and price, avoiding protracted negotiation with consumers.

*Externalities:* Firms, like individual persons, long for a sense of belonging to enhance organizational credibility. Enterprises may associate themselves with networks and alliances to build their external legitimacy, that is the perception that other firms and relevant state agencies know of a firm's existence and that it is credible in business undertakings. For instance, a network may assist a firm to get contacts

with government ministries, suppliers or even research institutions, which it cannot get on its own. Further, inter-firm networks and alliances improve contract enforcement since they nourish trust and help reduce opportunistic behaviour.

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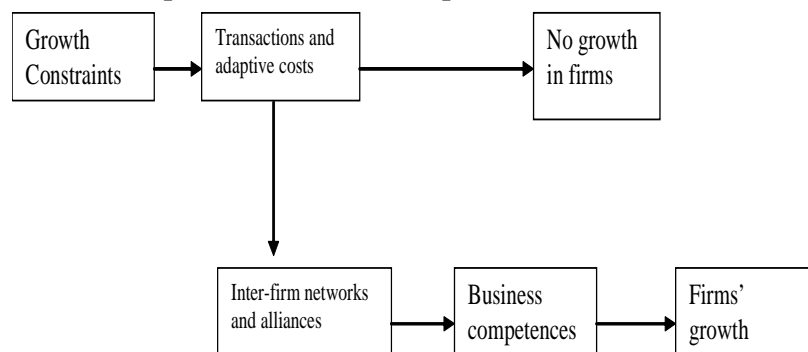
### 3. Conceptual Framework and Methodology

#### 3.1 Conceptual Framework

Lack of information that can mitigate a firm's growth constraints results in transaction and adaptive costs to the firm (Figure 1). Transaction costs cover the cooperation and coordination sacrifices necessitated by a business transaction. Any aspect of exchange, either within the firm or between firms, requires information of the subject matter for a transaction to take place effectively. Sourcing of raw materials or even better technology and access to markets for a firm's output has a cost element that is transactional. The adaptive costs include costs associated with scanning the business environment to identify technological and product change, and developing and implementing competitive response. The changing dynamics in inputs and outputs markets and technological development require firms to be innovative to be able to retain or even enlarge their market share through a strengthened competitive edge. Therefore, firms have to monitor the environment for signs of technological and product change, research and innovate for product development in response to competition challenges and do so ahead of competitors to avoid losing the market share.

For entrepreneurs to reduce the transaction and adaptive costs and achieve growth, they have to build up their capabilities (i.e. business competencies) by accessing the relevant knowledge and information required by the firm. As firms struggle to control the transaction and

**Figure 1: Link between growth constraints, inter-firm relationships and business competences**



*Source: Researcher's conceptualization of a firm's behaviour in overcoming growth constraints*

adaptive costs, they find it advantageous to join inter-firm networks to source information that can enhance their competencies to access better markets, overcome inputs limitations and improve product design, which promote the firm's growth. In trying to develop an analytical structure that gives insight on how a firm enhances its capability to access knowledge relevant to the operations of a firm, the following sub-section illustrates how inter-firm networks are formed to obtain and channel business information.

### *3.1.1 Conceptual link between growth constraints and information sources*

An emerging firm in a perfectly competitive market structure visualizes that a certain level of investment will bring forth a specific amount of earnings (profit), given the prevailing rate of return. Assuming there is abundant and cost-free information, the rate of return is bound to be certain and thus profit levels can be predetermined. This is so, as investment capital moves to where returns are high until an equilibrium rate is achieved across alternative and competing investments.

However, markets are imperfect and information is not freely available. Information is gathered either through firm-specific research, interactions between firms, between firms and individuals, or firm-based information synthesis. These information-gathering exercises are costly. To ensure that only those who contribute to covering these costs get the information benefits, information channels (sometimes called social structures) are formed to enforce discretionary exclusion, making information to be privately appropriated. Such structures also enhance efficiency in information accessibility. The social structures constitute networks between firms, whose ultimate purpose is to access information relevant to the firm's operations. Consequently, the social structures induce information asymmetry as they determine who has access and control of information, limiting the entrepreneurial opportunities to only a section of the business community. The amount and type of information available to an entrepreneur is thus dependent on the networks that connect him/her to other economic players in the market.

In a firm's production function, financial capital is crucial for availability of raw materials and production equipment, whereas human capital facilitates the transformation of inputs into outputs. Having the two types of capital does not guarantee profit. There is need for

information on resource markets and the nature and direction of consumer tastes and preferences. The networks derived from participating players in a relationship determine who knows about the marketing opportunities and who and when to make use of the opportunities. Thus, in addition to human and financial resources, an entrepreneur has to form relations within and beyond the firm so as to get a better rate of return on his/her investment. Economists refer to these social structures as social capital (Barr, 1998; and McCormick, 1996). This type of capital is embodied in the networks that a firm has with other participants in the market.

The purpose of social capital is two-fold: First, the scarcity of resource inputs necessitates a firm to strategize on how to access information on resource availability. The entrepreneur has to initiate relationships with resource owners or individuals/firms that have information on relevant resources. The entrepreneur can also be a source of information on resources required by other entrepreneurs. Therefore, well-structured networks will develop in situations where the participants in a network feel that mutual information benefits exist. Second, networks help in identifying profit opportunities that have highest rates of return. Entrepreneurs have to identify market niches and networks facilitate them in doing so. Contacts in places where useful information exists on market opportunities are in a position to provide timely and relevant information to enterprises in the network. Thus, the participating firms in a network will definitely have competitive edge over firms outside the network.

### **3.2 Research Design**

An in-depth analysis of the patterns of inter-organizational relationships and their effects on information flow between firms requires a combination of descriptive and causal-comparative research designs. Interpersonal and inter-firm cooperation arrangements in business transactions are not entirely translated into specific written stipulations. Therefore, to get a holistic appraisal of inter-firm relationships, it was necessary to interact with decision-makers in the firms and gain insights into the enterprises operations in their natural settings. Thus, a cross-sectional survey was done to capture the interplay of entrepreneur and enterprise-specific characteristics and their influence on the formation of inter-firm relationships.

### **3.3 Population Sampling**

Whereas coverage of the whole country is envisaged in the interpretation of the research findings, Nakuru town was selected as a focus of data collection efforts to allow for intensity of the study. Patterns of inter-firm networks and business alliances existing in a given region are likely to be replicated in other similar regions (similar in terms of business diversity and conglomeration). In addition to resource consideration, Nakuru town was chosen as the area of study since nature of business patterns in Nakuru town, in form of spatial layout and composition, typically reflects the pattern of industrial districts in other major towns in Kenya. Thus, the study results of the town can be generalized to other towns in Kenya that have similar business diversity.

#### *3.3.1 Sampling procedure*

The sampling of enterprises for analysis required prior knowledge of all firms operating in Nakuru town. However, firms in the town are located across the whole town but not in any systematic order. It would, therefore, be too costly to list the firms through physical identification of firms in their location. For this reason, the list of businesses from the Municipal Council of Nakuru was used to compile the sampling frame. The licensing department of the Municipality has a register of all businesses operating in town, recorded when firms apply for annual licenses. The Ministry of Local Government issues guidelines on business categories and respective size criteria of firms applicable for purposes of setting permit fees. Since firms in different business categories vary in structure and operations, this study focused on manufacturing firms to allow comparison of existing inter-firm networks among firms of different sizes. Table 3.1 shows the number of firms located in the five town zones and the manufacturing firms included in the sampling frame. Firms that exist as branches of other enterprises were excluded from the sampling list due to difficulties experienced in tracing the owners.

From a population of 316 manufacturing and agro-based processing firms, a sample of 100 enterprises was targeted for analysis. As this research involved both quantitative and qualitative analysis, the number of targeted firms fits within the rule of thumb recommendation of sample size for survey research. Because of the possible correlation between size and strength of inter-firm relationships, a stratified random sampling method (based on firms' size) was used. The number of firms

**Table 3.1: Geographical distribution of firms in Nakuru Town**

Town Zone	Total no. of firms	No. of manufacturing firms	No. of small firms (manufacturing)	No. of medium firms (manufacturing)	No. of large firms (manufacturing)
CBD	3,931	44	42	1	1
Industrial	749	87	41	22	24
South	3,368	89	87	2	0
Western	2,861	37	28	9	0
Eastern	977	60	50	3	7
Total	11,878	316	248	36	32

*Source: Compiled from Municipal council of Nakuru business records by the researcher, 2003*

sampled in each size category was proportional to the total number of firms in that category as reflected in the sampling frame.

### 3.4 Data Collection

#### 3.4.1 Background

The extent to which a firm will relate to other firms to obtain technology and market information is likely to be a function of both attributes of an entrepreneur and business characteristics. Inter-firm networks develop when owners of firms deliberately interact beyond the normal contractual arrangements. Unique features of participating firms influence the characteristics of the emerging inter-firm network. Thus, the study required attribute data that provides information on entrepreneurs and enterprises (age of entrepreneur, firm size, sales turnover, etc), and relational data that characterize links between individuals and also between enterprises that exist in business settings (number and type of relationships). To gauge the existence of inter-firm networks and alliances, the number of contacts a firm has with other similar/different firms, larger enterprises, individuals working in professional organizations and government departments were analyzed. The intensity (number of contacts), duration (number of interactions per year) and diversity (types of information sources) of contacts are used to characterize the nature of networking between firms.

To measure the size of the firm, a number of variables can be used, which include employment level, assets, sales and market value. There is limitation on the extent to which these variables can distinguish firms in different size categories due to their inherent correlation weakness. For instance, employment figures may reflect negative firm's growth

whereas market value and sales level could reflect a graduation of the firm from one size-category to another within a given period of time. As rightly pointed out by Hart and Oulton (1996), the choice of the measure of firm's size is, in practice, governed by the data available. The number of employees and/or the size of the premise are criteria used by the Municipal Council of Nakuru in classifying firms in different size categories. For this study, the level of employment was used to distinguish firms of different size category.

Conventionally, there is no standard employment level that is used to categorize firms, due to heterogeneity in structures and operations of the firms. Researchers use different employment levels to categorize firms, based on the type of analysis in question. For instance, Barr (1995) considers those firms with 1 to 9, 10 to 49 and at least 50 employees as small, medium and large firms, respectively. Liethholm (1990) regards small-scale firms to be those with less than fifty employees. The Ministry of Local Government in Kenya uses the following size criteria guideline for municipalities and local authorities' activities:

**Table 3.2a: Criteria used for classification of non-agro based manufacturing firms**

<b>Firm size</b>	<b>Industrial plants</b>	<b>Workshops-repair &amp; manufacture</b>
Small	Up to 15 employees or premises up to 100m <sup>2</sup>	Up to 5 employees or premises up to 25m <sup>2</sup>
Medium	16-75 employees or premises 100-2500m <sup>2</sup>	6-20 employees or premises from 25-500m <sup>2</sup>
Large	Over 75 employees or premises over 2500m <sup>2</sup>	Over 20 employees or premises over 500m <sup>2</sup>

**Table 3.2b: Criteria used to classify agro-based processing firms**

<b>Firm size</b>	<b>Agricultural producer/processor</b>
Small	Up to 10 employees
Medium	From 11-50 employees
Large	Over 50 employees

*Source: Compiled by the researcher from information contained in Single Business Permit Fee Schedule*



### *3.4.2 Survey instruments*

A researcher-administered questionnaire was used to collect the data. The researcher used Barr's (1995) questionnaire design for entrepreneurial networks as a reference in developing the research questionnaire. Since Barr's questionnaire is basically for the relational data, a series of questions on entrepreneurs and enterprise characteristics were included in the final questionnaire. The survey instrument was pilot-tested on ten enterprises for two weeks to ensure that it was adequate in yielding reasonably reliable data. The pilot exercise assisted in improving the structuring of the questions so as to avoid different understanding of the questions by respondents. The pilot survey also identified discrepancies in the way firms had been classified (based on size) by the Municipal Council. Some firms had deliberately given the wrong information to the Council in order to make low payments on annual license fees. The actual data was collected during the period, February to October 2002.

## **3.5 Approach to Data Analysis**

In attempting to address the research issues raised in the study, statistical and econometric methods were used to:

- Analyze the main constraints to firms' growth,
- Identify patterns of inter-firm relationships, and
- Determine the factors that determine business networks.

### *3.5.1 Growth constraints and the pattern of existing inter-firm networks*

The growth constraints are taken as informational problems that include technical and managerial skills, sources and types of credit products, direction of market niches and sourcing of relevant inputs. Responses on these growth constraints indicate frequencies of firms that encounter those constraints and therefore the intensity of the problem. Analysis of whether growth constraints change at different stages of the firm's growth is done by cross-tabulation of growth constraints across different sizes of the firm.

Knowledge of the firm size is also relevant in tracing the way firms source information that helps them to reduce growth constraints. Further, the number of contacts a firm has may increase the pool of knowledge available to an enterprise as long as the contacts are not redundant. However, network diversity is likely to determine the quality of information exchanged. Different networks provide knowledge of a different nature and mix. There is, therefore, need to reflect on other contacts, in addition to similar firms that entrepreneurs can interact with. Family ties, entrepreneurs in same or different lines of production, large firms, individuals working in professional institutions and government departments are all possible information sources.

The existence of a network is indicated by interactions between firms that are over and above normal transaction in exchange of goods and services. The intensity (number of contacts), diversity (types), and duration (stability) of the inter-firm interactions define the nature of the network. These aspects are analyzed by cross-tabulations of mean number (weighted by period of contacts) of interactions of firms (in the same/different line, with large firms, professionals and civil servants) across different sizes of the firm. The results indicate the strength of the networks that exist among firms in different stages of growth.

### *3.5.2 Determinants of network formation*

A fundamental issue raised in this study is what inclines a firm to approach a particular information source as it attempts to overcome its growth constraints. In exploring this question, we note that apart from the diversity of networks, contacts are more meaningful if they are stable. The number of times an entrepreneur interacts with contacts in a given period influences the amount of information attained by that entrepreneur. Therefore, in the analysis, the number of interactions made with the contacts in a year is used as weights for the number of contacts a firm has in different information sources.

A number of factors that characterize both the owner of the firm and the enterprise influence the choice of information sources. Since this is a choice or decision-making scenario, we expect that the enterprise attributes (age, size, sales turnover) and entrepreneur characteristics (age, number of years of formal education, previous experience) impact on the way a firm attempts to solve its growth constraints. The choice to network or interact with a given information source can be analyzed by

estimating a regression model to reveal the information-seeking behaviour applicable for each of the identified information source. A variety of regression models can be used to analyze the relationships between these variables. A qualitative response model that describes the stochastic relationship between the choice of an information source, and the enterprise and entrepreneur characteristics can be specified as follows:

$$Y_i = \beta_0 + \beta_1 AGEN + \beta_2 NYFE + \beta_3 PEE + \beta_4 AGEP + \beta_5 NE + \beta_6 SATU + E \dots\dots\dots(1)$$

Where:

$Y_i$  = 1 if information is sourced from a particular source, say, a family member, and =0 if otherwise.

AGEN= Age of the entrepreneur

NYFE= Number of years of formal education of entrepreneur

PEE= Previous entrepreneurial experience

AGEP= Age of enterprise

NE= Number of employees (proxy for size of enterprise)

SATU= Sales turnover

E = Error term

$\hat{a}_1, \hat{a}_2, \dots, \hat{a}_6$  are coefficients to be estimated.

However, as much as we expect entrepreneur and enterprise characteristics to influence the choice of information source, data on these characteristics is not sufficient to predict with certainty the choice made by the firm. What would be reasonable is to expect the entrepreneur and enterprise characteristics to influence the likelihood of a firm choosing an information source. Thus, the model in (1) above can be interpreted as the probability of making a choice (and not the observed choice itself). The probability is the conditional expectation of choice of an information source, given specific entrepreneur and enterprise characteristics.

In the case of a linear probability model, the regression coefficients in equation (1) give us the marginal effects of the entrepreneur and enterprise characteristics on the likelihood of choosing a given information source. However, due to linearity assumption, the predicted

probability of choosing a given information source may lie outside the 0-1 interval, contrary to an acceptable definition of a probability. To overcome the linearity limitation, it is necessary to use the logistic distribution function and write the probability of choosing an information source as:

$$P(Y) = F(w_j) = \frac{1}{1 + e^{-w_j}} \dots\dots\dots (2)$$

Where  $w_j = \hat{\alpha}_0 + \hat{\alpha}_i X_i$  and the subscript j denotes an enterprise and  $e^{w_j}$  is the odds of selecting a particular information source, i.e.:

Considering the ratio of the probability of choosing information source P (Y) with the probability of not making that choice, that is, P (Y) /1-P (Y), then;

$$\frac{P(Y)}{1 - P(Y)} = e^{w_j} \dots\dots\dots (3a)$$

If we get the natural log of equation (3a), we get the following log odds ratio:

$$L_j = \log [P(Y)/1-P(Y)] = \hat{\alpha}_0 + \hat{\alpha}_1 AGEN + \hat{\alpha}_2 NYFE + \hat{\alpha}_3 PEE + \hat{\alpha}_4 AGEF + \hat{\alpha}_5 NE + \hat{\alpha}_6 SATU + E \dots\dots\dots (3b)$$

Where  $L_j$  is the log odds ratio for enterprise j (the log of the odds that firm j will select a particular information source).

The coefficients  $\beta_i$  are estimated by maximum-likelihood method and each parameter shows the additive effect on the log odds ratio per unit change in explanatory variable.

Conditional on a firm choosing a particular information source, we analyze the intensity of use of that source. Specifically, the number of contacts a firm has is regressed on a source on various entrepreneur and enterprise characteristics and a dummy variable that captures the cultural values of entrepreneurs that may impact on their inclination towards inter-firm networking. The entrepreneur and enterprise characteristics are similar to those included in the logit model, but instead of using maximum-likelihood estimation method, the OLS method is used.

### *3.5.3 Hypotheses emanating from the model*

From the model specified in Section 3.43, the following relationships are hypothesized:

- The relatively older entrepreneurs have a pool of accumulated contacts that act as a basis of forming new inter-firm networks. Thus, the age of the entrepreneur is positively related to the choice of network formation and to the intensity of using the network.
- Firm owners with previous entrepreneurial experience inter-relate more with other entrepreneurs, since the previous networks are a stock of knowledge to the entrepreneurs who can cooperate and those who have resourceful networks.
- The level of formal education is positively related to the formation of inter-firm networking. This is because entrepreneurs with higher levels of education develop inherent sensitivity of changing business trends as they can use available business literature. This aspect induces them to interact to reduce input and output market uncertainties.
- Older firms are better placed than relatively newer firms in forming inter-firm networks. Firms that have been in existence for a long time have benefited from externalities derived from previous inter-firm networks identified by other firms in search of new links.
- The size of the firm, measured by the number of employees and sales volume, positively influences the degree of inter-firm networking. The small number of large firms makes it possible for them to participate in the inter-firm arrangements that reduce inter-firm rivalry and competition.

## 4. Empirical Results and Discussion

This section starts by highlighting the major constraints that hinder enterprises' growth. The next section compares the strength of networks among firms of different size categories. The chapter ends by evaluating the factors that influence the choice and intensity of inter-firm networking. In interpreting the results, the small sample should be noted.

### 4.1 Major Constraints to Growth

Inter-firm networks are potentially informational channels relating to growth constraints facing enterprises. Consequently, the analysis starts by focusing on growth constraints that firms face and assesses whether firm size impacts on the intensity of the constraints or not. Table 4.1 shows the major constraints to firms' growth as reported by sampled enterprises.

Except for market and raw material constraints, the data above suggests that firms in different stages of growth face different challenges. Lack of access to credit is more pronounced in small enterprises and the problem significantly reduces as firms grow. This observation concurs with Kimuyu and Omiti (2000) research finding that larger enterprises have a higher success rate in seeking credit, in comparison to small enterprises. There are two possible explanations for this observation relating to credit. First, there is a possibility that existing financial institutions have credit appraisal requirements that are punitive to small firms in terms of collateral and conditions set to minimize risks associated with lending to small enterprises. Alternatively, small firm owners lack the information on existing bank

**Table 4.1: Number of firms that indicated growth constraints across firm sizes**

Size of firms	Total no. of firms	Market	Raw materials	Credit	Debt repayment	Poor infra-structure	Technical skills	Managerial skills
Small	39	25(64.1)	12(30.7)	18(46.1)	5(12.8)	10(25.6)	1(2.6)	1(2.6)
Medium	21	16(76.1)	7(33.3)	5(23.8)	5(23.8)	7(33.3)	2(9.5)	0(0.0)
Large	11	6(54.5)	3(27.3)	1(9.0)	0(0.0)	6(54.5)	1(9.0)	0(0.0)
Total	71	47(66.1)	22(31.0)	24(33.8)	10(14.1)	23(32.4)	4(5.6)	1(1.4)

\*Note: The numbers in brackets are percentages of firms in that category reporting the constraint

products and have low motivation to seek information from financial institutions.

The proportion of large firms perceiving poor infrastructure as a major constraint is twice that of small enterprises. Large firms source raw materials outside the areas where they are located and therefore require efficient roads. Similarly, the major markets for products of large firms extend to other towns in the country. The poor state of roads will therefore increase marketing costs.

The medium-sized firms are more affected by non-repayment of debts for goods delivered to customers compared to large firms. Credit arrangements involving large firms are likely to be in formal contract agreements and, therefore, legal redress is possible in case of non-payments. The proportion of small firms facing payment problems from buyers is small, possibly due to the fact that most products from small firms are sold in small batches to different customers and this aspect reduces the possibility of having substantial credit sales. This is despite the fact that small firm dealings tend to be more personal, which supposedly should raise the potential for credit sales.

Few firms across different growth levels are affected by technical and managerial constraints, though about ten per cent of medium firms have the limitation of technical skills. Owner-managers may not have perceived managerial and technical constraints in their firms. The level of technical and managerial capabilities of an entrepreneur can only be determined if internal assessment of the competencies in the firms' operations is done. Thus, the low proportion of firms perceiving managerial and technical constraints could be as a result of inadequate appraisal of firms' operational challenges.

Market constraint is the major challenge facing enterprises, where 66 per cent of firms attribute poor performance to market limitation. The problem is more crucial to small and medium sized firms. Large firms may be having diversified market segments that involve people in different income groups. Therefore, they are comparatively less affected in case of an overall economic recession. Alternatively, large firms are probably more responsive than other enterprises in face of declining demand. A third of the firms in each size category are also constrained by lack of raw materials.

## **4.2 Strength of Networks**

As noted in the last section, constraints facing enterprises are not homogeneous across firms of different sizes. Firms can respond to growth constraints by sourcing relevant information, and inter-firm networks are good channels of such information. The diversity of the network a firm enjoys determines the type and amount of information available to the firm. However, the level of information exchange may depend on the strength of networks. If the knowledge gained from a given contact is different (in terms of nature and depth) from that sourced from another contact, then the strength of the network can be measured by the number of contacts a firm has in each category of information source. Therefore, there is need to establish whether the size of the firm determines the strength of networks (that is, the number of contacts with a particular information source). This analysis can be achieved by comparing the mean number of contacts in different categories of information sources across the different sizes of firms.

Various patterns of network emerge from this analysis (Table 4.2). By and large, the number of contacts a firm has does not significantly increase with firm size, though large firms have more networks than small firms. However, looking at specific interactions with different information sources, there are exceptions to this general pattern. The number of contacts a firm has with other enterprises in the same line of production increases as the firm grows in size. The difference in number of contacts between firms in large-size and small-size categories is statistically significant. This observation suggests that the strength of networks among small similar firms is weak. A possible explanation for this observation is that there are many small firms in an industry, with possibility of intense inter-firm rivalry and competition among them. The few firms that graduate to large firms and those that start as large enterprises may face oligopoly market structure with reduced competition. Networking at this level is therefore viewed as less risky but beneficial for evaluating common approaches to constraints facing the firms. Firms' conduct in such market situation might include charging similar prices for their products or they may opt to maximize scale economies through joint purchase and transportation of inputs.

A contrasting situation is observed in case of networking with firms in different lines of production. The number of contacts is the same for small and large enterprises, though slightly less for medium firms.



**Table 4.2: Strength of networks by firm size**

Inter-firm interactions between firms.....	Mean number of contacts					
	Small firms		Medium firms		Large firms	
		p value for the difference between mean no. of interactions: Small and Medium firms		p value for the difference between mean no. of interactions: Medium and Large firms		p value for the difference between mean no. of interactions: Small and Large firms
In same line of production	3.72	0.8387	3.95	0.1333	7.00	0.0412
In different line of production	10.05	0.2554	6.80	0.3327	10.63	0.8956
With larger firms	1.87	0.7945	1.57	0.0417	3.36	0.3595
With family members	6.67	0.8283	6.33	0.7306	5.63	0.5560
With individuals in professional bodies	1.79	0.0775	3.29	0.2061	8.63	0.0310
With civil servants	2.23	0.6605	2.67	0.4297	4.36	0.1857
Mean total no. of contacts	25.62	0.8397	24.57	0.1702	39.63	0.1358
Total Number of firms	39		21		11	

Possibly, the networking of firms in different lines of production is not for sourcing information relating to business but for other purposes such as social issues.

The element of strong social networking can also explain the high number of contacts between entrepreneurs of small family members who are in business. Small firms have the highest number of contacts with family members and this number decreases with firm size, though not significantly.

For interaction between firms and individuals working in various professional organizations, the number of contacts increases significantly as we move from small, medium to large enterprises. The difference in strength of networking is even more significantly pronounced between small and large enterprises. Two factors may explain the weak networking of small firms with persons working in professional organizations. The social status (for instance, education level, income earnings) between the two groups could be so different

that motivation to network from either group is lacking. Alternatively, the size of the firm could itself be a limiting factor. Business dynamics of small firms are unlikely to get the attention of professionals or government departments. Depending on how the bidding process of government contracts is done, large firms may find that some contracts are redundant.

### **4.3 Networking Choices**

Owner-managers can network with entrepreneurs in the same or different line of production and with larger firms. They can also interact with family members in business, individuals working in professional institutions and in government. The issue of concern, in this case, is how the enterprise and entrepreneur characteristics influence the firm's decision to be part of a network of any of these information sources.

The logit regression results in Table 4.3 highlight the main determinants of the probability of choosing different information sources. The columns represent the information sources, where a particular source takes a value of 1 when it is chosen and a value of zero otherwise. The estimated coefficients show how the choice of a particular information source is affected by a particular variable such as age of enterprise, that is how the logit index associated with a particular information source changes when each independent variable changes by one unit. It is important to note that the coefficients show the changes in a logit index and not in the probability of choosing an information source. However, an increase (decrease) in a logit index due to an increase (decrease) in a particular variable is strictly associated with an increase (decrease) in the probability that an information source will be chosen.

#### *4.3.1 Networking between similar firms*

According to Table 4.3, the probability of networking among firms in the same line of production is positively related to the number of employees and the firm's sales level. These results are consistent with the hypotheses in Section 3.4.4. They also confirm the observation in the last section that large firms in the same line of production interact more with each other than the small enterprises do. The age of the entrepreneur also influences a firm's probability of networking with other firms in the same line of production. However, the influence of

**Table 4.3: Estimation of logit model of choice of information sources**

Variables	Information sources					
	Similar firms	Firms in different line of production	Larger firms	Family members	Professionals	Govt.workers
Intercept	1.354 (1.608)	5.308 (2.075)**	-1.604 (1.299)	0.847 (1.757)	-0.842 (1.264)	1.850 (1.289)
Age of enterprise	-0.563 (0.037)	-0.020 (0.028)	-0.032 (0.026)	0.026 (0.048)	-0.017 (0.024)	-0.040 (0.027)
Number of employees	0.062 (0.055)	-0.010 (0.013)	0.004 (0.010)	0.010 (0.023)	0.002 (0.004)	0.005 (0.006)
Sales turnover	5.760 (1.070)	-1.110 (1.510)	2.490 (7.810)	-3.400 (9.180)	1.150 (2.540)	-1.240 (4.090)
Age of entrepreneur	0.025 (0.033)	-0.063 (0.034)	0.026 (0.025)	0.023 (0.038)	-0.013 (0.025)	-0.034 (0.025)
Years of formal education	-0.067 (0.101)	-0.048 (0.106)	0.088 (0.078)	-0.021 (0.110)	0.134 (0.079)*	0.001 (0.076)
Previous entrepreneurial experience	-0.106 (0.065)	0.020 (0.046)	0.039 (0.048)	-0.033 (0.067)	0.014 (0.040)	-0.009 (0.042)
No. of observations.		71	71	71	71	71 71
LR chi2 (6)	8.93	11.53	7.86	2.80	5.14	9.30
Prob > chi2	0.1773	0.0732	0.2482	.8334	0.5262	0.1575
Pseudo R <sup>2</sup>	0.1267	.1575	0.0834	0.0519	0.0522	0.0948

*Note: a) Standard error in parenthesis; b) One asterisk indicates significance at the 10% level, two at the 5% level.*

these enterprise and entrepreneur attributes on inter-firm networking in the same line of production is not statistically significant.

Whereas firms in the same line of production are expected to share information, entrepreneurs with higher levels of education and previous entrepreneurial experience tend to be averse to relating with other owner-managers in similar firms. This observation challenges the earlier prediction that good education and previous entrepreneurial experience positively influence inter-firm networking. Entrepreneurial experience negatively influences networking among similar firms. Past relationship with similar firms may have resulted in incidences that make entrepreneurs more careful before embarking on new networks. Similarly, entrepreneurs may shy away from relating with owner-managers who have higher levels of education, since their perception of growth constraints facing them is different.

#### *4.3.2 Information sharing with firms in different lines of production*

Contrary to the hypotheses construed from the model, the ages of the entrepreneur and of the enterprise, the number of employees, sales level and the entrepreneur's level of education have a negative effect on the firm's networking with firms in different lines of production. This finding can be explained by the dissimilar backgrounds of entrepreneurs in different lines of business in terms of training, business orientation and time of firms' entry into the market. However, experiences gained in previous business positively influence firm's choice to network with firms in other areas of production. This can be expected due to the possibility that the previous business of the entrepreneur was different from the current type of business.

#### *4.3.3 Larger firms as information sources*

Turning to inter-firm networks with relatively larger firms, both enterprise and entrepreneur attributes facilitate a firms' interactions with larger firms except for the age of the enterprise. The direction of the attributes' influences is as we predicted, though they lack statistical significance. Owner-managers of large firms who have had formal education and entrepreneurial experience are more likely to approach larger firms for market information. This observation confirms the earlier finding of low networking between small and large firms.

#### *4.3.4 Networking between family members*

Networking among business family members occurs in large firms as evidenced by the positive relationship between probability of obtaining information from family members and the number of firm's employees. The age of the entrepreneur and that of enterprise have a direct influence in network formation among family members. This observation may stem from the fact that family businesses may have been in operation for a long time. Higher levels of formal education and previous entrepreneurial experience reduce the chances of interaction between family members. This can be understood in the context that enhancement of an individual's education level increases the possibility of getting formal employment as opposed to starting a business.

#### *4.3.5 Firms' contacts with professional organizations and government*

As predicted in the hypotheses, an entrepreneur's level of education, previous entrepreneurial experience and the number of employees increases the chances for owner-managers to interact with experts working in professional organizations. The influence of education level on this form of networking is definite, given the statistical significance of the attribute. The possibility of making contacts in the government departments for tenders is higher for those entrepreneurs with high levels of education with medium-sized firms. They may benefit by contacting their former school colleagues, but their firms should be large enough to handle the quotation requirements.

#### **4.4 Culture and Network Formation**

The preceding sections show that large firms use networks more than small firms. However, the elements that constitute the firm size, i.e. the enterprise attributes in form of number of employees or sales do not fully explain the formation of inter-firm networks. As illustrated in Table 4.3, few coefficients of the enterprise and entrepreneurial attributes are significant in influencing the probability of networking.

To get a conclusive picture of the dynamics of network formation, we momentarily take into consideration the potential risks of opportunism in networking. Firms would be willing to network if they feel that the benefits are mutual. Since the decision to network must reflect the degree of uncertainty by the other agents in networking, trust becomes an integral issue in network formation.

This approach of synthesis of network formation is in line with what Kimuyu (1999) regards as social embeddedness of businesses. Kimuyu argues that social norms and basic values governing economic activities generate business systems that are highly integrated and mutually benefiting. Further, we are inclined to interpret Barr's (1994) concept of 'community spirit' to imply social and cultural specifics that make some community enclaves develop while the rest of the economy may be stagnating. Barr quotes the findings of other researchers concerning the existence of a group of ethnically distinct entrepreneurs of Nnewi town in Nigeria, who experienced impressive enterprise performance while the rest of the Nigerian economy reported poor growth in the 1983-1991 period.

The identity of ethnicity is not in itself a base for network formation. It is time-proven interaction practices between entrepreneurs that isolate individuals who can be trusted due to their ethical behaviour in business dealings and information sharing. Thus, business networks in most cases result from business interactions and same ethnicity identity does not go beyond the initial social acquaintance (Fafchamps, 2001). The referral system that exists in business transactions is ethnically influenced if there is concentration of business networks.

We have made reference to the above empirical evidence of interplay between cultural values and networks formation as we seek to find out if there is an influence of social norms in inter-firm networking. As Alessandro, Reinhard and Deakins (1997) explain, contract law and social norms play an important role in establishing long-term inter-firm cooperative relationship. However, contract enforcement in many African countries is weak (Fafchamps, 1996) and therefore cultural values can be expected to be central in fostering trust, which is an ingredient in the formation of inter-firm networks.

As Table 4.4 illustrates, Kenyans of African origin own the majority of small and medium-sized enterprises but large firms mostly belong to Kenyans of Asian community. Since 80 per cent of the industrial structure consists of small and medium firms, the ownership of industrial establishments by indigenous Kenyans is quite substantial.

Given the above pattern that shows differences of ownership across different firm sizes, there is need to find out whether cultural values and norms embodied in African ownership of firms influence the intensity of inter-firm networking (measured by the number of contacts a firm has). Thus, an ordinary least squares (OLS) estimation of the total number of contacts a firm has with their networking counterparts was undertaken, conditional on enterprise and entrepreneur attributes, but incorporating the cultural status of the entrepreneur.

The total number of contacts has been adjusted to exclude contacts that do not involve business information. The adjusted figure is then weighted by dividing it by the number of firms in a given size category a firm belongs to. This is done to correct the advantage of large numbers that naturally will enable some firms to have more contacts than others. For instance, small firms have higher numbers of similar firms they can potentially interact with than large firms since industrial establishment is size-skewed towards the larger firms. Table 4.5 gives OLS results of

**Table 4.4: Distribution of firms by race of entrepreneurs**

Size of enterprise	Race			Total
	Asian	European	African	
Small	1	0	38	39
Medium	5	1	15	21
Large	8	1	2	11
Total	14	2	55	71

estimation of a model that explains the intensity of use of sources of information by firms.

Econometric estimates of the number of contacts confirm the positive and significant impact of the size of the enterprise (measured by the number of employees) on the intensity of usage of information source. The age of the enterprise is also negatively related to the number of contacts. This may suggest that small enterprises are not necessarily new entrants in the market. Some large firms may be relatively newer in operation than some of the small enterprises. The age and level of education of entrepreneur correlate positively, though not significantly, with the number of contacts. The data also suggests that well educated persons network more than those with lower education levels. Entrepreneurs with higher levels of education may have a better perspective of scale economies benefits that arise from inter-firm networks.

Further, the results indicate that there is lower intensity to network among entrepreneurs of African origin. Since business networks avoid the element of opportunism by being tightly knit, the nature of networking among African entrepreneurs in Kenya may be devoid of issues relevant to business operations. For this reason, a number of African entrepreneurs may shy away from networking on business issues given the intense competition among small businesses.

**Table 4.5: Determinants of intensity of usage of information sources**

Variables	Coefficients	t-ratios	p value
<b>Enterprise characteristics</b>			
Age of enterprise	-0.06	-0.656	0.514
Number of employees	0.016	13.824	0.000
Sales turnover	1.870	4.587	0.000
<b>Entrepreneur attributes</b>			
Age of entrepreneur	0.007	0.869	0.388
Number of years of formal education	0.706	0.009	0.379
Previous entrepreneurial experience	-0.015	-1.122	0.266
Race dummy (1 for African)	-0.295	-0.903	0.370
Constant	0.198	0.333	0.740
Adjusted R-squared	0.8033		
F – Statistic	41.84		
Number of observations	71		



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## **5. Summary, Conclusions and Recommendations**

### **5.1 Overview**

Within the context of contemporary economic challenges of unemployment and poverty facing the Kenyan economy, issues relating to improving the growth of small firms are of interest to policy makers and the government. Donor agencies and governments in developing countries encourage creation of formal organizations that offer support services to small enterprises. However, empirical evidence shows that these support services have not significantly improved the performance of small enterprises.

An alternative path of assisting small firms is to enhance the inherent mechanisms that firms use to access information relevant to the growth constraints they encounter. This policy option requires that a clear understanding of the relational patterns of firms' behaviour in face of growth constraints exists. In Kenya, no research has been done on the way firms interact through inter-firm networks to overcome growth constraints. This study highlights the nature of inter-firm networks existing among business firms and the potential of these inter-firm relationships in accessing information relating to business growth.

The research was designed to allow a detailed description of the nature of existing inter-firm relations. Further, the influence of entrepreneurial and enterprise characteristics on formation of networks was taken into account. The research used descriptive and analytical research methods to gain insights on inter-firm relationships. Data on relational attributes and entrepreneurial and enterprise characteristics was sampled through a questionnaire administered to owner-managers of 71 enterprises. As reflected in the previous chapter, statistical and econometric methods were used to analyze the data.

This chapter highlights the main findings of the study. The chapter ends by reflecting on the policy implications of the research findings and the policy recommendations that arise from the study.

### **5.2 Growth Challenges facing Small Firms**

The research has identified obstacles that face enterprises in Kenya. Irrespective of the size of the firm, the major growth constraints facing the Kenyan manufacturing sector are lack of markets and raw materials.

These growth constraints are external to the firm; they result from dynamics of the macro environment that constitute the overall performance of the economy. Firms cannot be expected to grow when the overall economy is in recession. Therefore, all firms respond to the opportunities that arise with the growth of the economy.

This observation is consistent with most entrepreneurial surveys done in Africa, which link the low demand of products of small firms to the performance of the overall economy (Liedholm, 1990). The demand for products of small firms rises with general improvement of peoples' income, particularly those in the low-income group. Therefore, the argument advanced by Elkan (1989) on the way forward to overcome market constraints facing small enterprises is logical. Elkan suggests that high productivity and better incomes in the agricultural sector will promote small-scale industries given the backward and forward linkages that characterize the relation between the two sectors.

Many owner-managers do not perceive managerial and technical limitations as constraints to the growth of their firms. This observation challenges the usefulness of supply-oriented assistance programmes of donor-funded organizations that offer standardized training packages in managerial and technical skills. Since firms do not cite lack of managerial and technical skills as a business constraint, such support services cannot be expected to have any impact on growth of small enterprises. This finding therefore explains why, despite the existence of many business development support organizations, small firms have not benefited from these support services.

Further, the study findings show that most of the entrepreneurs obtain initial technical skills from government institutions or on-the-job training.

### **5.3 Nature and Determinants of Inter-firm Networks**

Firms have two broad decision options when they encounter growth constraints. On one hand, they may choose to interact with agents outside the firm so as to access information that may alleviate growth constraints; on the other hand, firms may opt not to respond to growth constraints, thereby pegging the fortunes of their businesses to the growth direction of the macroeconomic environment. The study results show that:

- Inter-firm networks of various forms exist among manufacturing firms in Kenya. The type of inter-firm network formed is influenced by enterprise and entrepreneur attributes.
- Few small firms forge links with other firms to access business information; suggesting that many small firms do not respond to growth challenges that face them.
- The size of a firm is a crucial factor in inter-firm networking. In addition, previous entrepreneurial experience and entrepreneur's level of education positively influence network formation involving firms and relatively larger firms.
- Only few small firms network with relatively larger firms yet such a relationship would yield scale and transaction-cost economies to small enterprises through sub-contracting arrangements.
- Owners of medium and large firms use family members as a source of information on credit. This is possibly due to the fact that most of the medium and large firms comprising the study sample are family-owned. Further, large firms also interact with professionals for purposes of accessing information on credit.
- By and large, the size of the firm is more critical in determining the intensity of networking as opposed to choice to network with other firms.

#### **5.4 Conclusions**

There are a number of issues that arise from the study. First, market and raw material constraints are among the growth challenges facing manufacturing firms in Kenya. The aspects are closely linked to overall performance of the economy. This observation is consistent with earlier research works. Second, managerial and technical limitations are least perceived as firms' growth constraints. This observation may possibly explain why supply-oriented business services have had minimal impact in improving enterprise performance. Third, various types of inter-firm networks exist among manufacturing firms in Kenya but small firms have weak inter-firm networks that can facilitate building business competences. Thus, small firms are not adoptive to changing business environment as is the case in Hong Kong or Japan. Fourth, there is more networking among large in comparison to small firms. Fifth, lack of

significant networking with large firms denies the small firms scale and scope economies that can result from this type of networking. Finally, the size of the firm, previous entrepreneurial experience and level of education of owner-managers positively influence the choice of inter-firm networking. The intensity of firm-firm networking basically influences the size of the firm.

### **5.5 Policy Recommendations**

The above findings call for policy interventions to enhance formation and use of inter-firm networks, since supportive and trusting relations are crucial to a firm's performance.

The study recommends that the government should improve the macroeconomic environment so that better incomes of low-income population can induce derived demand for small firms' products. For instance, there is need for sound fiscal and monetary policies to increase domestic purchasing power and improve competitiveness of local markets. Similarly, more efforts are required to improve availability and quality of infrastructure and institutions. Further, since there is latent inadequacy in management and technical skills, the government should promote training in these areas, for example by expanding public institutions that offer technical and management training.

In addition, the government should intensify efforts to increase the proportion of population with at least secondary level of education through, say, more subsidized fees payments, construction of more public schools and more financial support to learning institutions. Finally, the government should give incentives to large firms that have sub-contracting arrangements with small firms. These incentives may include reduced corporate tax and exemption of inputs from all the tariffs.

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