The Legal Environment and Finance: Evidence from East Africa

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ABSTRACT

This dissertation examines the effect of the legal environment on access to several types of external finance, and on the decision to invest, for the 3 countries that make up the East African Community (EAC). The results suggest that well defined creditor rights are positively correlated with access to bank loans. Strong creditor rights places pressure on firms to keep good quality financial records. More lending takes place in this environment. A good quality legal system also improves access to non-bank finance, namely trade credit and leasing finance. The analysis demonstrates that collateral in the form of machinery and equipment improves access to bank finance. Collateral appears to be of greater importance when legal enforcement costs are relatively low and information asymmetry is more acute. The results also show that the property rights environment is important for investment. However, the protection of property rights has a more meaningful effect on investment in an environment where the costs of corruption are lower and courts are more efficient. Access to bank finance has a significant positive effect on investment. Thus, a legal system that improves the flow of funds from banks to firms promotes growth enhancing activities. Internal sources of finance are also found to be important for investment. It is recommended that strong emphasis is placed on improving the laws protecting the rights of creditors over property pledged as collateral and over information they can obtain from debtors. Debtor rights over assets in their possession should also be strengthened.

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CHAPTER 1: INTRODUCTION

1.1 Background to the Study

A positive relationship has been established between the quality of the legal system and access to external finance in both developed and developing countries (La Porta et al, 1997; La Porta et al, 1998). According to Fabbri (2001), the legal system affects financial markets in two ways. Firstly, it does so through the content of the law which defines the rights and powers of outside investors. The content of the law is also important for defining the property rights borrowers have over assets they use as collateral. Evidence suggests that an improvement in property rights leads to better access to credit (Acemoglu and Johnson, 2005). Secondly, the legal system affects financial markets through how effectively the laws can be enforced. This second channel is widely referred to as legal formalism (Djankov et al, 2003). More efficient enforcement is associated with greater access to credit and lower collateral constraints (Japelli et al, 2005). This implies that the legal system can have a positive impact on economic growth via financial markets.

The full benefits of the legal environment on economic growth will be realized when legal institutions not only enhance the availability of finance, but also enhance its use in productive activities. The legal system needs to protect firms pursuing profitable investment opportunities as much as it protects the suppliers of finance. Where the property rights of firms are better defined and protected, the likelihood of expropriation by government and other powerful groups declines (Acemoglu and Johnson, 2005). This has a positive effect on investment. Thus, the legal system provides a 'transmission mechanism' from finance to growth. Better quality legal systems enhance access to finance and promote investment, ultimately boosting economic growth. Notably, investment whether it is pursued using external finance or internal sources, will be affected by the property rights environment.

A well developed legal system plays an important role in protecting the rights of creditors partly because it facilitates the flow of information about borrowers to creditors. Creditors use this information to make decisions about lending, and to aid them in taking appropriate action in the event of default. According to Brownbridge (1998), the problems of moral hazard and adverse selection are major reasons for the poor performance and low lending that characterize banks in Sub-Saharan Africa (SSA). Improving the legal environment can have a positive impact on

information availability in financial markets, which will in turn make banks more willing to provide loans.

In sub-Saharan Africa where most formal finance is provided by the banking sector, collateral becomes an integral part of debt contracts. Stock markets in SSA are still underdeveloped, characterized by low capitalization and a limited number of listed firms (Ndikumana, 2001). Notably, even in developed countries banks are the main providers of external finance (Gorton and Winton, 2003). The provisions of the law and the efficiency of the enforcement process will have a bearing on the role that collateral plays in the provision of bank finance. However, Nkurunziza (2005b) argues that given the weakness of the legal systems in most of SSA, the collateral mechanism in these countries is ineffective in enforcing contracts between banks and borrowers. Similarly, Fleisig and de la Pena (2003) explain that poor laws and legal institutions in developing countries make collateral in the form of real estate and movable property ineffective in improving loan terms.

The problem of poor contract enforcement is compounded by the weakness of secondary markets for capital goods in African countries. Even if the bank is able to repossess the assets pledged as collateral, selling the assets to recover the loan is difficult. Collier and Gunning (1999) find that very few African manufacturing firms use secondhand equipment. They also find that when the equipment is sold, it involves a large discount. Gunning and Pomp (1995) report that in Zimbabwe new capital goods sell at a discount of up to 50 percent.

When collateral is effective as a contract enforcement mechanism, it can lead to favourable loan terms for firms requiring bank credit (Qian and Strahan, 2005). In particular, banks may be willing to demand lower collateral requirements, and a firm may be able to obtain bank finance at lower interest rates and with longer maturity. These benefits have positive implications for the profitability of the firm and for its long-term investment plans. In contrast, if the quality of the legal system is poor, mechanisms that do not depend on the court system to enforce financial agreements will be relied upon more heavily. Traditional forms of collateral will be replaced with collateral substitutes[1]. These substitutes enable the borrower to pledge less in terms of physical assets (Rodriguez-Meza, 2004). Although more widely used in informal financial markets, collateral substitutes can also play a role in formal debt markets.

[1] Collateral substitutes are meant to address the problem of inadequate tangible assets required as security for a bank loan. See section 1.5 for a detailed definition.

Under a weak legal environment, banks will ration credit more severely, and firms will benefit from the availability of sources of finance that do not depend on the collateral mechanism. Two sources of finance that tackle the problem of inadequate collateral are trade credit and leasing finance (Fafchamps, 1997; Gallardo, 1999). Trade credit refers to credit extended by a seller who allows delayed payment for his products. The products are normally intermediate goods for the buyer. In several African countries, trade credit is the most important source of working capital (see Fafchamps et al, 1994; Fafchamps et al, 1995 and Bigsten et al, 2003). Financial leasing is a contractual arrangement between two parties, which allows one party (the lessee) to use an asset owned by the other (the lessor) in exchange for specified periodic payments. Mutesasira et al (2001) find that there is a large unmet demand for leasing among small firms in Uganda and Tanzania.

Using manufacturing sector data collected through Investment Climate surveys, this dissertation examines how the legal environment affects access to external finance and investment in the East African Community (EAC). The dissertation makes an important contribution towards understanding how the institutional framework affects economic activity in SSA. The focus is on four main issues. First, is the relationship between the quality of the legal system on one hand, and access to external finance and the terms of this finance on the other. Second, is the effect of collateral and collateral substitutes on access to bank finance.

The third issue the dissertation investigates is how the legal environment affects trade credit and leasing finance. Finally, the dissertation examines how property rights affect the investment decisions of these firms. To the best knowledge of the author this dissertation is the first attempt with firm level data to explore the relationship between the legal environment and different sources of external finance in the context of SSA. Furthermore, to the best knowledge of the author, it is also the first detailed attempt at investigating how property rights affect investment decisions by African manufacturing firms.

1.2 The EAC Economies

The East African economies of Kenya, Uganda and Tanzania make up the EAC which was established in 1999[2]. Table 1.1 below shows selected economic indicators for the three countries

[2] Kenya, Uganda and Tanzania had enjoyed a long history of co-operation under successive regional integration arrangements prior to 1999. These included the East African High Commission (1948-1961); the East African

for the period 1990-2003[3]. Kenya is the largest economy in the region, with approximately twice the GDP of Uganda. Kenya also has a higher GDP per capita than Tanzania and Uganda. However, economic growth in Kenya has been far slower compared to the other countries, particularly since 1996. Tanzania and Uganda are among the fastest growing economies in Africa while real GDP per capita in Kenya has declined in recent years.

During the period 1990-1995, the average inflation rate in the 3 countries was fairly high particularly in Tanzania where it was close to 30 percent. Between 2001 and 2003, all 3 countries succeeded in reducing inflation to single digit figures. Inflation in the most recent period is highest in Kenya.

Table 1.1: Selected Economic Indicators, (period average)

Country	1990-1995	1996-2000	2001-2003
Kenya			
GDP (billions of US$, constant 2000)	10.8	12.3	13.4
GDP per capita (constant 2000 US$)	362.6	358.0	341.9
GDP Growth Rate (%)	2.0	1.8	1.3
Inflation Rate (%)	23.6	8.5	5.8
Real Interest Rate (%)	8.6	16.7	7.9
Uganda			
GDP (billions of US$, constant 2000)	3.6	5.3	6.6
GDP per capita (constant 2000 US$)	188.8	238.8	269.7
GDP Growth Rate (%)	6.9	6.5	5.9
Inflation Rate (%)	23.0	4.7	3.2
Real Interest Rate (%)	-8.0	16.8	15.9
Tanzania			
GDP (billions of US$, constant 2000)	7.1	8.4	10.4
GDP per capita (constant 2000 US$)	257.0	260.7	294.2
GDP Growth Rate (%)	2.7	4.1	6.9
Inflation Rate (%)	28.9	12.7	3.2
Real Interest Rate (%)	-6.1	9.4	10.0

Source: The World Bank (2005), World Development Indicators

For the period 1990-1995 real interest rates in Uganda and Tanzania were negative, pointing to the financial repression that characterized these economies. However, following financial reform

Common Services Organization (1961-1967); the East African Community (1967-1977); and the East African Co-operation (1993-1999).

[3] Our background analysis of the EAC economies is up to 2003. This is primarily because our main data source is for the period 2002-2003. Limiting our macroeconomic background data to this time frame gives our discussion meaningful context.

in these countries beginning in the early 1990s, the EAC as a whole now has positive real interest rates. This is important for mobilizing savings needed to undertake investment.

The EAC identifies private sector development as crucial at the national level, and to the regional integration process. In all three countries, manufacturing activity constitutes an important part of the private sector. Table 1.2 shows manufacturing as a percentage of GDP in the 3 countries. Kenya has the largest manufacturing sector in the EAC, growing from an average contribution to GDP of 11 percent during 1990-1995 to account for approximately 14 percent of GDP during 2001-2003. The World Bank (2004a) reports that the sector is one of the fastest growing, and the third largest formal private industry in Kenya. The sector has also registered growth in Uganda where it contributed about 10 percent of GDP during 2001-2003. Tanzania has the smallest manufacturing sector and is the only country to have experienced a decline in the contribution of this sector during 1990-2003. However, the sector is Tanzania's largest urban employer and the most reliable source of government revenue in terms of import sales, and corporate and individual income taxes[4].

Table 1.2: Manufacturing, value added (% of GDP), (period average)

Country	1990-1995	1996-2000	2001-2003
Kenya	11.0	11.4	13.1
Uganda	6.2	9.0	9.6
Tanzania	8.1	7.3	7.3

Source: The World Bank (2005), World Development Indicators

Table 1.3 shows the average annual growth in investment for the period 1990-2003. Kenya and Tanzania recorded very little new investment for each year in this period. However, Uganda experienced a relatively higher annual rate of capital formation. The importance of investment for economic growth implies that much effort is required to understand and remove the bottlenecks to investment in the EAC. The Investment Climate data used in this study is useful for this purpose.

Table 1.3: Gross Capital Formation (Average Annual % Growth), 1990 - 2003

Country	Average % Annual Growth
Kenya	2.0
Uganda	7.4
Tanzania	1.0

Source: The World Bank (2005), World Development Indicators

[4] This information was obtained from the Tanzania National Website.

Kenya has the most developed financial sector in the EAC. Table 1.4 shows that domestic credit to the private sector as a percentage of GDP has been far greater in Kenya for the period 1990-2003 than in Uganda and Tanzania. The same holds for the M2/GDP ratio. Important to note however, is that during this period there has been a sharp decline in credit provision in Kenya. There has also been a decline in credit to the private sector for Tanzania. Uganda is the only country to have registered growth for both indicators over this period.

Table 1.4: Selected Financial Sector Indicators, (period average)

Country	1990-1995	1996-2000	2001-2003
Kenya			
Domestic credit to private sector (% of GDP)	33.3	32.0	23.3
Money and quasi money (M2) (% of GDP)	33.6	43.4	38.8
Uganda			
Domestic credit to private sector (% of GDP)	4.3	5.7	6.5
Money and quasi money (M2) (% of GDP)	8.7	13.6	17.6
Tanzania			
Domestic credit to private sector (% of GDP)	10.8	4.0	6.2
Money and quasi money (M2) (% of GDP)	19.6	18.5	19.5

Source: The World Bank (2005), World Development Indicators

In line with Table 1.4, Table 1.5 shows that Kenya has the most well developed banking sector in the EAC. It has close to twice the number of commercial banks in Tanzania and 3 times that of Uganda. Geographic branch penetration measures the number of bank branches per 1,000 square kilometres. Demographic branch penetration is the number of bank branches per 100,000 people. On both measures Kenya has the highest penetration.

Table 1.5: Selected Banking Sector Indicators

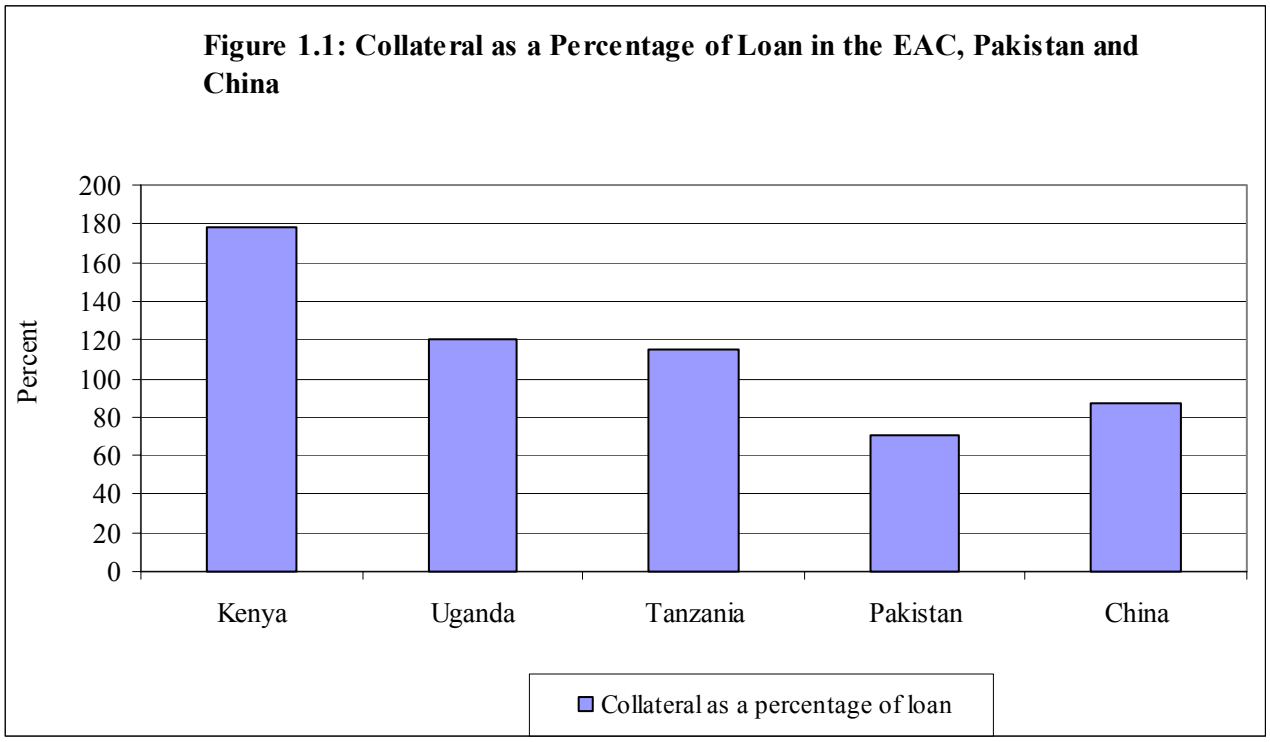
Country	Number of Commercial Banks	Geographic Branch Penetration	Demographic Branch Penetration
Kenya	43	0.77	1.38
Uganda	15	0.67	0.53
Tanzania	22	0.23	0.57

Sources: Central Bank Websites and Beck et al (2005).

1.3 Collateral in East African Manufacturing

Figure 1.1 shows the average collateral requirements faced by manufacturing firms in the three countries, and in Pakistan and China. For all EAC countries, the average collateral-to-loan value exceeds 100 percent. Notably the average value of collateral required is significantly higher in Kenya. In addition, the collateral-to-loan ratios in the EAC are substantially higher than in Pakistan and China.

Figure 1.1: Collateral as a Percentage of Loan in the EAC, Pakistan and China



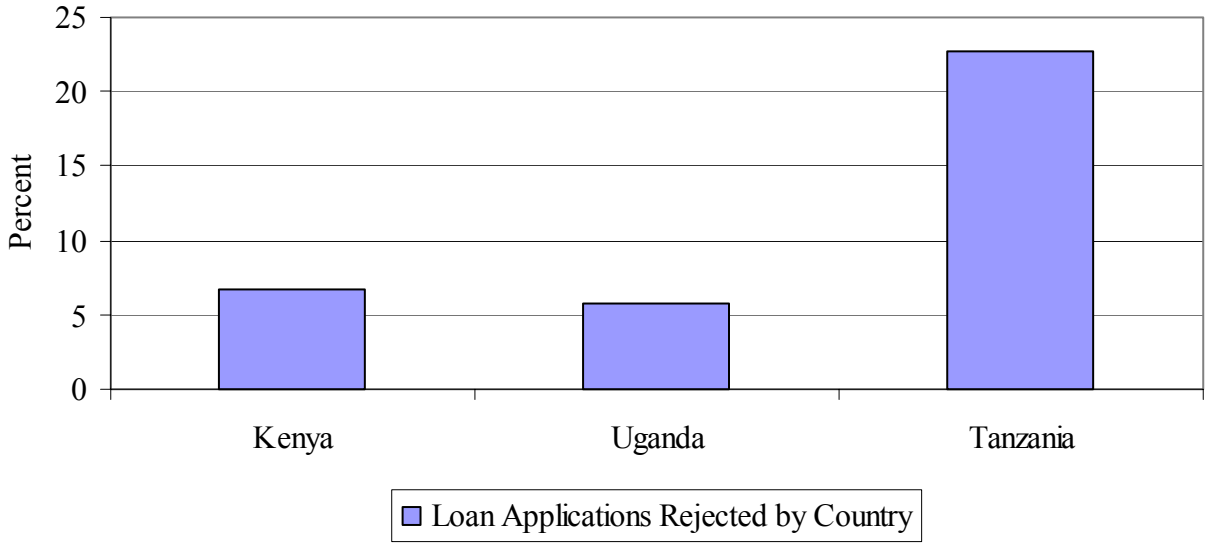
Source: World Bank (2002/03), Investment Climate Surveys

Although the collateral-to-loan ratios are high in all three countries, the extent to which collateral is a constraint for firms in the EAC varies across the three countries. In Kenya only 4 percent of firms stated that inadequate collateral was the main reason for not applying for a bank loan. In Uganda the corresponding figure is 10 percent. Tanzanian firms were not asked to single out a main reason for not applying for a bank loan. Instead, they were asked which factors contributed to their decision not to apply for a bank loan. 52 percent of Tanzanian firms gave "inadequate collateral" as a reason for not applying for a loan. Only 2 Kenyan firms and 4 Ugandan firms reported that their loan applications were rejected due to inadequate collateral. In contrast, 12 Tanzanian firms had their loan applications rejected because of insufficient collateral. This is

worth noting given that Tanzania had the least number of firms applying for a loan and the smallest sample in the ICA surveys[5].

The rate at which loan applications are rejected is far higher in Tanzania compared to Kenya and Uganda, as shown in Figure 1.2. The high rejection rate in Tanzania could be a result of inadequate collateral. It is consistent with the high proportion of Tanzanian firms who cite inadequate collateral as a deterrent to applying for bank credit. It is also consistent with the relatively larger number of Tanzanian firms whose loan applications have been rejected due to inadequate collateral.

Figure 1.2: Loan Applications Rejected by Country



Source: World Bank (2002/03), Investment Climate Surveys

It appears that Kenyan firms are not seriously constrained by collateral despite the high collateral requirements. This can be partly explained by the relative size of the Kenyan economy and higher level of financial development. Furthermore, as Table 1.8 will show, Kenyan firms are clearly larger than Ugandan and Tanzanian firms. The literature review and empirical analysis will demonstrate that firm size is a critical determinant of access to external finance. Ugandan firms are moderately constrained by collateral. It will be seen in chapter 3 that the low rejection rate in Uganda is explained by the fact that only firms with substantial collateral apply for bank loans. Tanzanian firms appear to face serious collateral constraints. Why do Tanzanian firms

[5] Kenya, Uganda and Tanzania had 128, 121 and 112 loan applications, respectively. The survey covered 282, 300, and 276 Kenyan, Ugandan and Tanzanian firms, respectively.

appear more constrained by inadequate collateral than their counterparts in Kenya and Uganda? The findings indicate that this is partly because of poor quality legal content in Tanzania.

Collateral is used to address moral hazard and adverse selection problems (Bester, 1985; Boot, Thakor and Udell 1991). The more serious these informational problems are, the more likely it is that banks will use collateral to exclude low quality borrowers from bank credit. Where the quality of information is poor, banks will depend more on collateral to signal the quality of borrowers and to reduce the incentive to deviate loan funds into activities other than the project for which they are intended. It is also possible that banks may demand very high collateral requirements as a way of rationing credit. The observation that Tanzanian firms face more severe collateral constraints may in part reflect a weaker financial-information system in that country. For example, it will be shown in chapter 2 that compared to Kenya a significantly lower share of Tanzanian firms have good quality financial records.

1.4 Rationale for the Study

Although it is widely accepted that the legal environment is important for the provision of external finance, there is limited evidence at the firm level on this relationship in the context of SSA in general, and the EAC in particular. Studies on credit access in SSA state that poor quality legal systems contribute to the limited flow of external funds (e.g., Bigsten et al, 2003), but little has been done to test this empirically. Recent evidence from the World Bank Doing Business Survey (2005) of 155 developed and developing countries shows that better legal protection is associated with a higher credit/GDP ratio. Policies aimed at improving the institutional environment under which formal financial markets function will be strengthened by a closer examination of this relationship.

It is also important to distinguish the effect of the content of the law on the one hand, and of the enforceability of the law on the other. Fabbri (2001) states that any law, no matter how well formulated, is intrinsically useless if it can not be effectively enforced. This view is shared by Levine (1998) who argues that the enforcing of legal codes is as important as the legal codes themselves. As the dissertation will show in chapter 2, the legal environments in the 3 countries have significant differences with regard to these two aspects. Thus the EAC presents an excellent case study for examining how the legal environment can affect access to external finance and investment.

A crucial part of the protection that the legal system gives to creditors is to ensure that they have access to information about borrowers. Information asymmetry is recognized as a major deterrent to the proper functioning of financial markets. In the context of African countries, where information problems are generally acute, it is useful to examine the role that the lack (or availability) of information has on access to external finance. There is currently an absence of micro-level studies about this relationship.

The legal system has important implications for investment via the property rights assigned to and enforced on behalf of firms. According to Johnson et al (2002), property rights are fundamental because entrepreneurs will not invest if they expect not to reap the return on their investment. Significantly less work has been done on this link compared to the literature on the relationship between the legal system and access to finance. This is particularly the case for SSA. It is critical that a better understanding of how property rights influence investment is obtained, given the important role that investment plays in stimulating economic growth. Acemoglu and Johnson (2005) argue that there are still many important questions that have not been answered with regard to how property rights affect economic activity.

This dissertation examines in detail the importance of collateral for access to bank finance. It is worthwhile to assess the importance of collateral in the EAC for several reasons:

- Collateral requirements in the EAC are extremely high. Figure 1.1 showed that collateral requirements in the EAC exceed the loan value and are higher than what obtains in other developing countries. This can result in firms failing to secure bank finance.

- There are clear differences in the severity of collateral constraints across the three countries. It is likely that the legal environment is part of the reason. The more ineffective collateral is the more likely banks are to reject loan applications on the basis of inadequate collateral.

- The weak institutional framework that characterizes developing countries makes information asymmetry more acute. Collateral is expected to play an important role in tackling these asymmetries. However, because the institutional framework is weak, collateral becomes less appropriate as a contract enforcement mechanism (Menkhoff et al, 2004; Nkurunziza, 2005b).

- Most of the cross-country literature on how the legal environment affects financial markets is based on what Qian and Strahan (2005) call the extensive margin - the impact on total credit supply. It is also important to examine what they refer to as the intensive margin - the impact on the terms of loans. In this study the author considers this latter channel as well by examining the relationship between the quality of the legal system on one hand, and collateral requirements and credit maturity on the other.

- According to Haas (2004), a major shortcoming of the literature on law and finance is that there is no clear explanation of exactly how legal institutions affect financial development. He argues that the literature has consisted mainly of broad cross-country analysis, with little theoretic and microeconomic grounding. Examining collateral as one possible channel through which this relationship can be explained will be useful in addressing this deficiency in the literature.

A better understanding of how collateral substitutes affect access to bank finance is important in finding strategies that improve the ability of firms to secure bank loans. According to Balkenhol and Schütte (2001), if banks were better informed about the benefits of collateral substitutes, they would be more willing to offer loan contracts using these substitutes. Banks may be reluctant to extend credit to firms because of adverse selection and moral hazard problems. Collateral substitutes provide unique information about borrowers, thus alleviating adverse selection. They also improve incentives for repayment (McKee, 2004), and thus reducing moral hazard.

The EAC has identified private sector development as crucial at the national level, and to the regional integration process. Access to external finance is essential if meaningful private sector development is to take place. Indeed, bank finance has been found to have a significant role on firm growth in Africa. Nkurunziza (2005a) presents evidence showing that access to bank credit is an important determinant of manufacturing firm growth in Kenya. Based on eight African countries, van Biesebroeck (2005) finds that bank finance is strongly associated with higher productivity levels in manufacturing firms. In light of this, it is critical that ways of improving access to bank finance by African manufacturing firms are explored further in order for them to realize their full potential as part of the private sector.

Trade credit is a very important source of external finance for African manufacturing firms because it has the potential to address the collateral problem. This implies that policy interventions to improve access to external finance in Africa will benefit from further analysis of trade credit. Although there is a fair amount of work on trade credit in Africa, little has been done on the relationship between collateral and trade credit. Similarly, although leasing finance is acknowledged as a potentially important means of addressing collateral constraints (see Westley, 2003; Gallardo, 1999), there is little work on how it can play this role in the context of African firms. Note that trade credit and leasing finance address the financing needs of firms in different ways. Trade credit is used mainly for working capital requirements, i.e. to purchase raw materials. On the other hand leasing makes capital equipment available to firms. One could argue that trade credit performs the role of short-term bank credit while leasing finance substitutes for long term bank loans. These two sources of finance are complementary to one another with regard to the production process of the firm, and thus investigating both of them is a useful exercise.

Focusing on the manufacturing sector is justified by several reasons. Firstly, securing finance is generally difficult for manufacturing firms (UNIDO, 1999). Given the capital-intensive nature of their activities, these firms tend to require medium to long-term and relatively large loans. Such financing is harder to secure than smaller loans required for shorter periods. Secondly, the manufacturing sector has the potential to make a significant contribution to economic development in the EAC as it has done in other regions. The phenomenal growth registered by the Newly Industrialized Countries (NICS) of East Asia is largely attributed to expansion in the manufacturing sector (see Radelet et al, 1997; Timner and Szirmai, 1997, Hallward-Driemeier et al, 2002).

Thirdly, a large proportion of manufacturing firms in the EAC are Small and Medium Scale Enterprises (SMEs)[6]. Manufacturing SMEs in Africa face severe constraints in accessing external finance, and bank finance in particular (Bigsten et al, 2003; van Biersebroeck, 2005). Part of the reason for SMEs being excluded from bank finance is their limited access to collateral. However, SMEs play an important economic role in the EAC. It is estimated that the sector accounts for about a third of GDP and employs close to 20 percent of the labour force in Tanzania (Government of Tanzania, 2003). In Uganda approximately 800,000 SMEs provide

[6] 56 percent, 74 percent and 80 percent of Kenyan, Ugandan and Tanzanian firms in the ICA surveys are SMEs. Micro firms are also included in our categorisation of SMEs.

employment to lower income sectors of the economy (Kasekende and Opondo, 2003). This implies that many manufacturing firms in the EAC are likely to face collateral constraints and addressing these constraints can have substantial economic benefits.

In addition, the manufacturing sector promotes industrial development by facilitating technological transfer. Empirical evidence supports the premise that productivity spillovers do take place following technological transfer to the manufacturing sectors of developing countries (Kathuria, 2000). Finally, data is readily available to analyze this sector. The Regional Program on Enterprise Development (RPED) at the World Bank has undertaken Investment Climate Analysis (ICA) surveys of manufacturing firms in Kenya, Uganda and Tanzania among others. This provides a detailed data source that can be used to investigate how the institutional environment affects manufacturing firms. This data source is relatively new and very limited analysis has been done using it.

1.5 Objectives of the Study

This study has two broad objectives. The first is to examine how the legal environment affects access to external finance and the terms on which it is made available. The second objective is to investigate how the legal environment (through the assignment and protection of property rights) affects investment. More specifically the study will pursue the following objectives:

- Examine the relationship between the quality of the legal system on the one hand, and access to bank finance, trade credit, and leasing finance on the other.
- Investigate the relationship between the quality of the legal system and credit terms (i.e., maturity and collateral requirements).
- Assess the relationship between the legal environment and information asymmetry.
- Examine the effect of collateral and collateral substitutes on access to bank finance.
- Assess the relationship between collateral and access to trade credit.
- Investigate the relationship between the property rights environment and the decision to undertake fixed investment.

1.6 Definition of Terms Used in the Study

Quality of the Legal System

The quality of the legal system with regard to the functioning of credit markets depends on two factors. Firstly, it depends on the content of the law. This refers to the written law that defines the rights and powers of creditors and debtors. Although both parties are important, the law must in particular ensure that creditors are well protected in as far as recovering credit provided to debtors. Secondly, the quality of the legal system depends on how effectively the laws can be enforced. Enforceability is in turn affected by whether or not the judicial process is prone to corruption, the speed at which disputes over credit contracts are settled, and the overall capacity of the judicial system. For the legal system to be effective in facilitating the flow of external finance, the content of the law and the enforceability of the law are equally important. If creditors are well protected on paper, but are unable to recover debt in practice, then the legal system is poorly suited for the development of credit markets.

The written law also defines the property rights of entrepreneurs over the investments they undertake. A good quality legal system will clearly define and protect these property rights, thus lessening the probability that firms will have their investment and the returns that are generated expropriated by powerful groups. The legal system also needs to enforce these rights in a manner that is free and transparent. Poor enforcement (even of well defined property rights) can discourage investment.

Property Rights

According to Barzel (1997), legal property rights are the rights assigned over an asset or commodity to a person and enforced in part by the government. These rights play an important role in facilitating third party adjudication and enforcement. Fleisig and de la Pena (2003) state that in the context of developing countries, property rights can be divided into two main categories in line with the main economic issues. The first relates to rights concerning the ownership, use and disposition of property. The second comprises security interests in property. This second group of property rights deals with the taking of property (including property where ownership is assigned to another party) and selling it in order to pay for a financial obligation such as a bank loan.

Equally important are the rights of firms over their investment (for example plant, equipment, buildings, land, and intellectual property) and over the returns generated by this investment. Norton (1998) states that property rights exist as basic legal rules and procedures for defining and settling ownership. Property rights allow enterprising economic agents to enter into contractual arrangements in their attempt to maximise wealth.

Access to External Finance

Access to external finance in this study refers to whether or not a firm has some source of finance that is not generated internally. It can also refer to the amount of external finance that a firm is able to obtain, but the study is limited only to the first definition[7]. The main sources of external finance used by African manufacturing firms are trade credit and bank finance. In addition to these two sources the study is also interested in access to leasing finance. According to the definition in this study, improving access to external finance means increasing the likelihood that a firm is able to obtain one of these sources.

Bank Finance

Bank finance refers to loans provided by commercial banks. The maturity of these loans varies substantially. Some loans are payable in a year, while others are payable over a period of up to 20 years (largely via repeated roll-overs).

Trade Credit

Trade credit refers to credit extended by a seller to a buyer, whereby both the seller and buyer are firms (Cunat, 2004). The seller allows delayed payment for his products for a specific period of time. The products are usually intermediate goods for the buyer. Trade credit is used mainly to meet working capital requirements.

Leasing

Financial leasing is a contractual agreement between two parties, namely the lessee and the lessor (Gallardo, 1999). The lessee uses an asset owned by the lessor for a significant part of its

[7] For a discussion on why we do not use this definition of access to credit see Chapter 3.

useful life, in exchange for agreed upon periodic payments. Maintenance costs and the risk of obsolescence are borne by the lessee. The lessor remains the legal owner of the asset for the period of the lease contract. The lessee normally has the right to purchase the asset from the lessor for a nominal amount at the end of the contract. In contrast, an operating lease is short term in nature and is not a way of financing the purchase of equipment. The leasing company bears the risk of obsolescence and maintenance costs.

Relationship Lending

Relationship lending refers to the building of close ties between a firm and the bank, resulting in favourable credit terms being extended to the firm. Boot (2000) defines relationship lending as the provision of financial services by a financial intermediary that (a) invests in obtaining customer-specific information, often proprietary in nature; and (b) evaluates the profitability of these services through multiple interactions with the same customer over time and/or across products. He states that relationship lending is most directly aimed at resolving problems of asymmetric information by facilitating close monitoring and screening.

Collateral

In the context of developing countries, collateral is usually a physical asset pledged by a borrower to a lender until a loan is paid back. It is also possible for collateral to be in the form of intangible assets such as accounts receivable and inventory. If the borrower defaults the lender has the right to seize the collateral and sell it to recoup the loan (Balkenhol and Schutte, 2001). According to Nagarajan and Meyer (1998) collateral is defined as any physical asset with the following three characteristics: (a) appropriately leading to ease of liquidation in case of default, (b) absence of collateral-specific risks[8], and (c) accrual of the returns to the borrower during the loan period either through direct economic returns from the use of the asset, or indirect returns from the investments made with loans obtained using the asset as collateral.

For collateral to be an effective contract enforcement mechanism, Bell (1989) states that two assumptions must hold. Firstly, in case of default banks are able to repossess the collateral using the court system if need be. Secondly, a ready market with minimal transactions costs exists for

[8]For example, the asset pledged as collateral is not more likely to lose its value during the course of the debt contract compared to other assets normally pledged as collateral.

trade in the assets put up as collateral. In addition, Rodriguez-Meza (2004) states that collateral should have value for the borrower implying that default is costly for the borrower. Collateral must also have value for the lender, which can be realized by selling the pledged assets.

There are two important aspects to these definitions that make collateralization an obstacle to accessing bank finance. Firstly, there has to be a marketable asset. In many cases firms (especially smaller ones) do not have such assets, and if they do they are not of adequate market value to satisfy the requirements of banks. Secondly, there has to be a pledge by the borrower to the lender. This entails a formal contractual obligation that can be enforced by the legal system. If contract enforcement is poor as is the case in SSA, then lenders will be less willing to provide loans.

Collateral Substitutes

Balkenhol and Schutte (2001) explain that collateral substitute is a fairly loose term referring to a number of techniques used to address the shortfall in real, tangible assets that banks require firms to pledge in order to secure a loan. Collateral substitutes are used to augment inadequate traditional collateral items. They enable the borrower to offer an alternative form of "state verification". Thus, in defining collateral substitutes the author attempts to address the absence of a physical asset. This is well demonstrated in informal financial markets where traditional collateral requirements are minimal or non-existent. McKee (2004) defines collateral substitutes as products designed to create strong incentives for repayment. Given the important role played by the legal system in ensuring that the collateral clause is enforced, a collateral substitute also captures the need for some institutional mechanism for enforcement purposes. This mechanism will normally be informal in nature.

The most common collateral substitutes are based on some attribute of the borrower, or some institutional arrangement that improves the information available to the lender (like collateral, a collateral substitute should be able to alleviate the problem of information asymmetry). Rodriguez-Meza (2004) highlights that among the most commonly used collateral substitutes are: the borrower's reputation, the borrower's credit history, the value of a long-term relationship with a lending organization, peer pressure in solidarity groups, and credit guarantee systems. He states that the majority of collateral substitutes cannot be used to compensate lenders for the loss

of funds in case of default. He concludes that this makes collateral superior to collateral substitutes.

Collateral Constraint

High collateral requirements may lead to collateral constraints, but do not necessarily mean that firms are constrained by collateral in their demand for bank finance. Collateral is a constraint to accessing bank finance if firms do not apply for a bank loan because they lack adequate collateral. In addition, collateral is a constraint to accessing bank finance if a firm's application is rejected because it lacks sufficient collateral. This means that collateral is a constraint only if its absence or inadequacy causes firms to be excluded from bank finance.

The ultimate goal of reducing collateral constraints is to improve access to bank finance by firms. If firms with a demand for bank finance are likely to secure a bank loan or are able to obtain large loans, then collateral constraints are likely to be minor. In contrast, if a large part of demand for bank finance remains unmet collateral constraints are likely to be severe.

Corruption

Corruption is an act in which the power of public office is used for personal gain in a manner that contravenes the rules of the game (Jain, 2001). In addition to weak institutions, Aidt (2003) gives 2 other conditions that are necessary for corruption to arise and persist:

- Discretionary power: the relevant public official must have the authority to design and administer regulations with discretion.
- Economic rents: the discretionary power must permit the extraction of existing rents or the creation of new ones.

1.7 Data Sources

In this section the main data sources are discussed and a descriptive analysis of the manufacturing sectors of the ECA countries is undertaken. These sources are the Investment Climate Analysis (ICA) surveys of the manufacturing sector in the EAC countries, and the World Bank Doing Business survey data. The data are examined by size, age, and sector across the three countries.

1.7.1 The Investment Climate Data

According to the World Bank (2004a), "the objectives of the ICA are to assess the current performance of formal manufacturing firms, to identify the key constraints on their growth and competitiveness, and to prioritize and assess policy priorities to promote private sector development." The surveys were conducted by The Regional Program on Enterprise Development (RPED) at the World Bank. A broad range of topics are covered in the ICAs including investment, export participation, infrastructure, access to credit, use of courts to resolve disputes, and corruption. The data are mainly cross-sectional based on ICAs completed for Kenya, Uganda, and Tanzania between 2002 and 2003. A few variables, for example sales and employment, have data for several years. The surveys covered 282 Kenyan, 300 Ugandan, and 276 Tanzanian manufacturing firms, respectively.

1.7.1.1 The Sampling Process[9]

Kenya

The sample was drawn from a census conducted by the Central Bureau of Statistics (CBS) of nearly 2,000 formal manufacturing firms employing more than 250,000 full-time employees. In order to ensure representation of all types of firms, the sample was stratified across location, industry, and size. The nine manufacturing industries were: agro-industry, chemicals and paints, construction materials, furniture, metals, paper, printing, and publishing, plastics, textile and leather, and wood. 368 firms were selected randomly from the clusters, representing approximately 20 per cent of all formal firms. Several firms, in many cases non-African and foreign ones, refused to be interviewed. Where possible, these firms were replaced with other firms having the same characteristics as the ones that refused. Due to the high rate of refusal, however, the replacement strategy was only partly successful and, in the end, 282 firms completed the survey.

Uganda

A list of officially registered companies was obtained from the Uganda Bureau of Statistics, which compiled the list during a nationwide census conducted in 2001/02. The list includes all activities in the formal sector, which had a total of 182,687 permanent employees. The sampling frame was stratified by location, manufacturing industry, and size. Following the stratification of

[9] The sampling process is as explained by the ICA reports prepared by the World Bank.

the sample frame, firms were selected randomly in each cluster. A total sample of 410 firms was drawn, with an overall sampling rate of 28.5 percent. To obtain the correct distribution of manufacturing activities, nine broad industries were defined: agro-industry; chemicals and paints; construction materials; furniture; metals; paper, printing, and publishing; plastics; textiles and leather products; and wood.

Tanzania

These firms were randomly selected from a sampling frame that was stratified by firm size, sub-sector and location. The sampling frame was constructed using lists from various government sources. The National Bureau of Statistics (NBS) provided the most important list. The data were collected for 8 industries and in 10 regions of mainland Tanzania, including Zanzibar. The industries and regions covered in the survey were selected based on the relatively high concentration of manufacturing firms in these areas. The industries are: furniture and wood; textiles, garments, and leather; construction materials; paper, printing, and publishing; chemicals and paints; metals; plastics; and agribusiness.

1.7.1.2 Distribution of Firms by Industry, Age and Size

Table 1.6 shows the distribution of firms across the different industries. The furniture and wood industries are combined for Kenya and Uganda allowing us to have 8 industries for all 3 countries. For all 3 countries, the agro-industry is the largest, with Uganda having the greatest number of firms in this industry. This is consistent with the heavy reliance on agriculture in these countries. Uganda also has by far the largest number of firms involved in construction materials, while Tanzania has the largest number of firms in the wood and furniture industry. Kenya has the most firms in plastics and metals. It also has the most firms involved in textiles, garments and leather products.

Table 1.6: Industry Distribution of Firms[10]

Sector	Kenya	Uganda	Tanzania
Agro-industry	83 (29.4)	122 (40.7)	81 (29.3)
Chemical and Paints	25 (8.9)	18 (6.0)	27 (9.8)
Construction materials	17 (6.0)	40 (13.3)	11 (4.0)
Metals	49 (17.4)	21 (7.0)	29 (10.5)
Wood and Furniture	20 (7.1)	54 (18.0)	65 (23.6)
Paper, Printing and Publishing	18 (6.4)	23 (7.7)	25 (9.1)
Plastics	23 (8.2)	7 (2.3)	7 (2.5)
Textile, Garments and Leather products	47 (16.7)	15 (5.0)	31 (11.2)
Total	282	300	276

Source: World Bank (2002/03), Investment Climate Surveys
Note: Numbers in parentheses are percentage shares.

It is clear from Table 1.7 that Kenyan firms are on average older than firms in Uganda and Tanzania. This is partly a result of economic and political developments that have taken place in Uganda and Tanzania in the post-independence period. Tanzania pursued socialism until 1985 while Uganda was plagued by severe political unrest until 1986, when the current president came to power through a military coup. Furthermore, both Tanzania and Uganda undertook nationalization policies that served to curb foreign investment and entrepreneurship in these countries. On the other hand, Kenya has pursued fairly market-oriented policies under a relatively stable political environment. Therefore, historically Kenya has enjoyed a more conducive environment for private sector development.

Table 1.7: Age of Firms

Age	Kenya	Uganda	Tanzania
Mean	27.1	13.3	18.0
Standard Deviation	19.6	14.4	14.2

Source: World Bank (2002/03), Investment Climate Surveys

Kenya has a greater proportion of large firms compared to Uganda and Tanzania, as can be seen from Table 1.8. This is not surprising given that Kenyan firms are significantly older than their counterparts and that the Kenyan economy is the largest in the region. Less than 4 percent of Kenyan firms are micro in size, while the corresponding share for Uganda and Tanzania is 18 percent and 17.6 percent, respectively[11].

[10] The wood and furniture industries are combined for Kenya and Uganda.
[11] Micro enterprises have less than 10 employees, small firms have 10-49 employees, and medium firms have 50-99 employees. Large firms have 100 employees or more.

Table 1.8: Size Distribution of Firms (%)

Size	Kenya	Uganda	Tanzania
Micro	3.8	18.0	17.6
Small	34.0	51.0	40.1
Medium	17.6	11.3	17.6
Large	44.7	19.7	24.6
Total	100.0	100.0	100.0

Source: World Bank (2002/03), Investment Climate Surveys

1.7.2 The Doing Business Data

The World Bank's Doing Business (2005) indicators will be an important source for data on legal rights of creditors and borrowers, contract enforcement, and information availability with respect to credit markets in the EAC countries. Indicators measure government regulations and their effect on businesses, especially on small and medium-size domestic firms across 155 countries. The data are based on research of laws and regulations, with contribution and verification from more than 3,000 local government officials, lawyers, business consultants, and other professionals who routinely administer or advise on legal and regulatory requirements.

Factual information is used in the data collection process, allowing for contact with various local respondents. This addresses potential misinterpretations of questions. Standard templates/questionnaires have been developed for all topics covered. The indicators are benchmarked to January 2005 and in the majority of cases refer to each country's most populous city. It is assumed that this data is adequately reflective of what obtained in the EAC countries at the time of the ICA surveys in 2002/2003. That is, the institutional environment is not expected to have changed substantially over a period of 2 years.

1.7.3 Other Data Sources

Other data sources include the World Development Indicators prepared by the World Bank, and the International Financial Statistics of the International Monetary Fund (IMF). These sources have provided macroeconomic data used in this chapter and exchange rates used in chapter 3.

1.8 Limitations of the Study

This study is limited to the three countries that constitute the EAC. Although this has been motivated in an earlier part of this chapter, it does impose some important restrictions. For

example, all three countries are former British colonies and hence have all adopted the British legal system. Thus less variation in the legal environment across countries is present as compared to related studies. Furthermore, one could argue that there is more to learn by comparing countries that are more diverse geographically and in terms of economic policy objectives.

Cross sectional data sets have limitations when used in econometric testing. These include missing variables, measurement error, misspecification error, and selection bias. These limitations of cross-sectional data can lead to biased results when using regression analysis. Hence it will be necessary to take appropriate measures to address these problems. While the study acknowledges that the data have limitations, useful insights can still be and are obtained. The data are rich and there is currently little research that has been done using them. Furthermore, it is expected that this study can form the basis for future studies that use more sophisticated estimation techniques such as panel data analysis when additional data becomes available.

CHAPTER 2: THE LEGAL ENVIRONMENT AND EXTERNAL FINANCE: DESCRIPTIVE EVIDENCE

2.1 Introduction

Two separate aspects of the legal system that can affect access to external finance were identified in chapter 1: the content of the law and the efficiency of the judiciary in enforcing the law. In this chapter descriptive analysis is used to examine the relationship between the legal environment and access to external finance. Measures of the quality of the legal system are developed using ICA data. In addition, legal system indicators that are financial-market specific are obtained from the Doing Business data.

The quality of the legal system can affect the functioning of financial markets by (a) reducing information asymmetry problems and (b) affecting the terms of finance. Therefore, the study compares the legal system measures against indicators of information availability. The legal indicators are also compared against bank collateral requirements and maturity for bank loans and trade credit. To the best of the authors knowledge this chapter is the first attempt to provide micro evidence on how the legal environment relates to both access to finance and the terms of finance for a group of African countries. Part of the novelty of the analysis is that the chapter examines micro data relating to two different types of external finance, namely bank finance and trade credit.

In this chapter some similarities are drawn between an understanding of the content of the law and enforceability, and the separation of property rights and contracting institutions in Acemoglu and Johnson (2005). This is because this study's distinction is closely related to that made by these authors. This study holds that property rights relate more to what is assigned to individuals in the written law. On the other hand, Acemoglu and Johnson (2005) examine contracting institutions in terms of the cost of enforcing private contracts; similar to what is considered in this chapter. This comparison is helpful in formulating the hypotheses tested in this chapter.

2.2 Literature Review

In this section a review is done on literature pertaining to the relationship between the legal environment on one hand, and access to external finance and the terms of this finance on the other. The section also reviews literature on how the legal system affects information asymmetry.

2.2.1 Models Relating the Legal Environment and Access to External Finance

The observed empirical relationship between the quality of the legal system and access to external finance has led to the development of models attempting to explain this phenomena. Fabbri (2001) develops a model to analyze how the degree of legal enforcement affects the level of private investment. The model assumes the government is responsible for enforcement, whereby enforcement refers to the repossession of collateral. It also assumes the presence of moral hazard in order to explain the existence of credit constraints. The model shows that financing constraints can also be explained by how effectively the legal rights of creditors can be enforced: more efficient enforcement is associated with more access to finance.

Another model relating enforcement to access to external finance by firms is constructed by Krasa et al (2003). Their model considers both the ability and willingness to pay back a loan in the presence of an enforcement mechanism that resembles a court. The cost of enforcement is measured by a deadweight loss to the contracting parties that depends on accounting standards. Poor accounting standards lead to higher costs incurred by the court to verify the value of a firm's assets, or to higher costs associated with corruption such as payments to court officials. An increase in this deadweight loss leads to a reduction in the lender's expected payoff. Their model predicts that firms in countries with poor institutions characterized by high costs of enforcement will find it difficult to raise external finance.

Japelli et al (2005) argue that the cost of enforcing contracts is a key determinant of access to bank finance. They develop a model based on opportunistic debtors and inefficient courts. Poor judicial enforcement leads to an increase in opportunistic behaviour because borrowers anticipate that lenders will only be able to recover loans through the courts at a very high cost. The fraction of collateral that the bank can recover is used to measure judicial efficiency, with a higher fraction representing greater efficiency. They show that with a competitive banking sector an

increase in this fraction leads to a reduction in minimum collateral requirements and reduces the number of credit constrained borrowers. Their model's predictions are supported by panel data on Italian provinces. Bank finance is found to be less widely available in provinces with longer trials and larger backlogs of pending cases.

A distinction is made between property rights institutions: institutions that protect the rights of citizens against expropriation by the government and elite groups, and contracting institutions: institutions that enforce private contracts in Acemoglu and Johnson (2005). They develop a model to show how differences in property rights and contracting institutions affect financial and economic performance. Their model predicts that contracting institutions may influence the type of financial transactions, but have little effect on the level of financial intermediation. In contrast, the model predicts that property rights institutions have a significant effect on the level of financial intermediation. They argue that contracts between borrowers and creditors can be restructured to reduce the negative effects of costly contract enforcement. However, no contractual negotiations are possible with respect to property rights institutions as this would imply the state and elitist groups are willing to constrain their own expropriating behaviour.

Lombardo and Pagano (2002) develop a model relating the law and equity markets. In their analysis they state that the legal system can affect equity markets through three distinct channels. First, legal limits to managerial discretion can affect the share of profits that managers can divert. Second, auditing and monitoring costs incurred by shareholders will be lower given regulations that improve the availability of information. Finally, more efficient law enforcement could increase the set of business contracts that can be enforced in court. Similar to the bank-based models, their model predicts that better legal institutions increase the equilibrium quantity of external equity.

2.2.2 Empirical Evidence

La Porta et al (1997) and La Porta et al (1998) are the seminal works on investigating the relationship between the legal environment and access to external finance. Based on a sample of developed and developing countries they find that the legal environment (encompassing both legal rules and enforcement) is important for the size and extent of a country's capital markets. They argue that a good legal environment protects lenders against expropriation by borrowers, making lenders more willing to provide funds in exchange for securities. Their evidence suggests

that countries with poorer investor protection measured by the nature of the legal rules and the ability to enforce them have smaller and thinner capital markets.

In addition La Porta et al (1997) make an important distinction about how legal origin affects the rights of creditors and outside investors. They find that countries which have adopted English common law have laws offering the strongest protection to shareholders and creditors. In contrast, countries of French civil law origin offer the least protection. The quality of enforcement is found to be highest in Scandinavian and German civil law countries. Enforcement is poorest in countries having adopted French civil law. To investigate further the importance of legal origin, La Porta el at (1998) assess its role in explaining cross-country differences in access to external finance. They show that whether a country's commercial and company law is based on British, French, German or Scandinavian legal origins has a significant role in explaining the level of bank and stock market development. Their findings are supported by Beck et al (2001) and Beck et al (2003).

Levine (1998) investigates the relationship between the legal environment and banking development for a sample of developed and developing countries. He finds that countries where the written law gives preference to the rights of creditors have better developed banking sectors measured by bank credit to the private sector as a share of GDP. His results also show that enforcement is important. Countries with strong enforcement of contracts are characterized by better developed banks compared to countries where enforcement is weak. The observed divergence can be linked to legal origin.

Demirguc-Kunt and Maksimovic (1998) assess whether an underdeveloped legal system negatively affects the ability of firms to invest in profitable projects. Based on a sample of thirty developed and developing countries they find that countries with better developed legal systems are associated with firm growth that is more dependent on long-term debt and equity. Better functioning legal systems are associated with greater dependence on long-term external finance. They also find that the return on capital in countries with well-developed legal systems is lower relative to countries with underdeveloped legal systems. This leads them to conclude that strong legal systems are associated with lower profitability and hence a higher dependence on external finance.

Based on firm level data from the World Business Environment Survey for thirty-eight countries, Beck et al (2004) examine whether the independence of the judiciary and adaptability of the legal system (i.e. the ability of legal traditions to adapt to the contracting needs of the economy) affect the constraints that firms face in obtaining external finance. They find that firms in countries with legal systems of French origin report higher obstacles due to collateral requirements, lack of access to long-term loans, and bank bureaucracy. They conclude that the adaptability of a country's legal system is more significant for explaining constraints faced by firms in accessing external finance than the political independence of the judiciary.

Using data for a group of 57 developed and developing countries Qian and Strahan (2005) examine how the legal and institutional environment affects bank loan terms. They find that in countries where creditor's rights over collateral are better protected loans are more likely to be secured, have lower interest rates, and have longer maturity. Their findings also suggest that in countries with high legal enforcement costs domestic banks tend to lend to low quality borrowers, while foreign banks lend to high quality borrowers at high interest rates.

Cristini et al (2001) test the hypothesis that poor legal enforcement has a negative effect on credit markets using provincial data from Argentina. They find strong results in support of this hypothesis. Provinces with poor legal enforcement have significantly less credit available to borrowers and have a higher ratio of non-performing bank loans. Similar evidence is found in the case of Brazil by Pinheiro and Cabral (1999). Using state-level data they find that the quality of judicial enforcement has a significant effect on credit/GDP ratios.

2.3 The Legal Environment and Information Asymmetry

The legal environment can affect access to external finance via its impact on information asymmetry. Laws requiring that debtors keep financial records and make this information available to creditors can play a role in alleviating adverse selection and moral hazard. However this channel has received limited attention in the literature. The impact of the legal system on the quality of financial information has been studied mainly in the context of equity markets. Gul and Qiu (2002) examine the relationship between measures of legal protection, law enforcement, and corporate governance on one hand, and country level scores of information asymmetry on the other, for a group of 22 emerging markets. Their results show that countries with stronger

legal protection, enforcement and corporate governance are associated with lower levels of information asymmetry.

Eleswarapu and Venkataraman (2004) analyze the trading costs of 412 American Depository Receipts (ADRs) from 44 countries that are traded on the New York Stock Exchange (NYSE). They find that stocks from countries with better legal enforcement have lower adverse selection risk and trading costs. Their results show that information risk (reflected in trading costs) is lower for countries with better accounting standards.

Much of the literature on the relationship between the legal system and information asymmetry relates to disclosure of financial information. Kothari (2000) presents a summary of literature on the effects disclosure of financial information on the risks associated with financial markets. He states that the quality of financial information depends on both the quality of standards governing the disclosure of accounting information, and the enforcement of standards. If enforcement of disclosure standards is weak then the quality of disclosure tends to be poor.

The use of disclosure regulations is motivated by some researchers as a response to market failures. According to Watts and Zimmerman (1986) and Beaver (1998) accounting information can be viewed as a public good because shareholders implicitly pay for it to be produced but are unable to charge potential users for its use. Free riding on information by potential investors leads to under production of information in the economy, and therefore the need for regulation. Watts and Zimmerman (1986) and Beaver (1998) also argue that disclosure regulation can be a result of factors other than market failures. Regulators may be interested in protecting less informed investors. Minimum disclosure requirements minimize the information gap between informed and uninformed investors.

2.4 Summary of Literature Review

The literature review revealed that the quality of the legal system has a positive impact on access to external finance. A better quality legal system provides better protection for creditor's rights, is associated with more effective enforcement, and leads to lower levels of information asymmetry.

Gaps in the literature have been identified in line with the objectives of the study. There is limited firm level evidence on how the legal environment affects access to external finance in SSA. In particular little has been done to disentangle the relative roles of the two aspects of the legal environment; the content of the law and the enforceability of the law. Furthermore, little is known about the relationship between the legal environment and information asymmetry in SSA. Finally, firm level evidence on how the legal environment relates to the terms of external finance in SSA is extremely limited.

2.5 Measuring the Quality of the Legal System

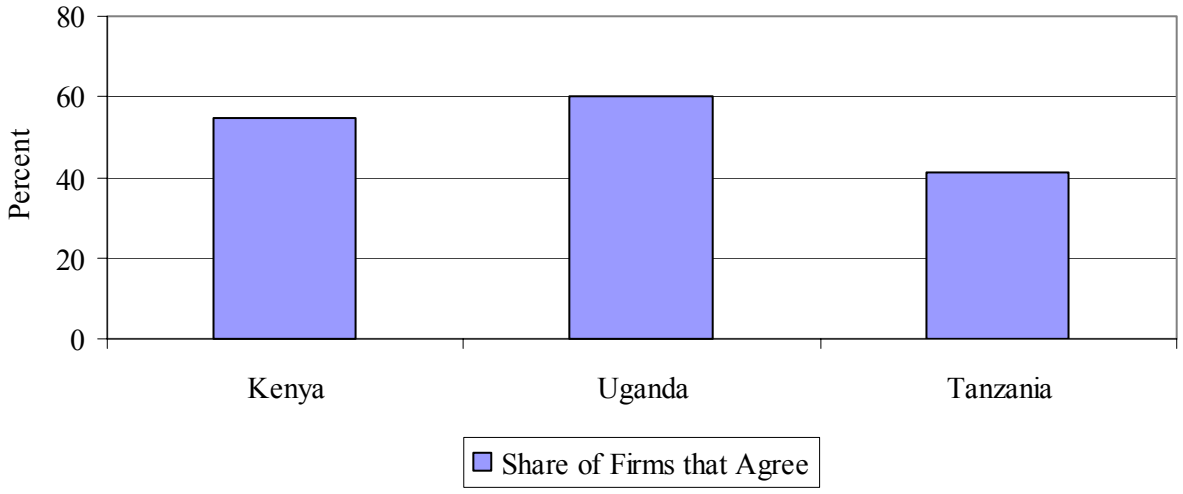
To measure the quality of the legal system indicators on (a) the content of the law and (b) enforceability are required. Indicators of these 2 aspects are developed and discussed in this section.

2.5.1 Content of the Law Indicators

The quality of the content of law is measured based on responses to a question about the consistency and predictability of regulations affecting firms. It is expected that better quality legal content translates into stronger rights for creditors over assets pledged as collateral by borrowers, and less ambiguity over the ability of borrowers to pledge these assets. The ICA survey asked firms whether they think that government officials interpret business regulations in a consistent and predictable way based on a scale ranging from 1 to 6. Responses of 1 means that a firm fully disagrees that officials interpret regulations in a consistent and predictable manner. A response of 6 means that a firm fully agrees that the interpretation is predictable and consistent. The study argues that the better the content of the law the more likely it is that the interpretation by officials will be consistent and predictable.

Figure 2.1 shows that at just over 40 percent, Tanzania has the smallest share of firms agreeing that government officials interpret regulations in a consistent and predictable manner. Uganda has the highest share of 60 percent, which is marginally higher than what obtains in Kenya. From Figure 2.1 one can argue that Tanzania has the lowest quality legal content. This indicator does have an important limitation. It is very broad in the sense that it does not specifically address the functioning of financial markets.

Figure 2.1: Share of Firms Agreeing that Interpretation of Regulations is Consistent and Predictable (%)



Source: World Bank (2002/03), Investment Climate Surveys
Kenya (n=268) Uganda (n=285) Tanzania (n=266)

Thus, it would be meaningful to augment this indicator with another indicator that can at least partly address these limitations. This is done using the Doing Business legal rights index, which reflects the legal rights of borrowers and lenders. This index has the advantage of being based on credit markets. Using data collected through the study of collateral and insolvency laws, the index measures the degree to which collateral and bankruptcy laws facilitate lending. Among aspects covered by the index are: the extent to which secured creditors are able to seize their collateral when a debtor enters reorganization; whether general, rather than specific, description of assets is permitted in collateral agreements; and if a registry that includes charges over movable property exists. The index ranges from 0 to 10, higher scores indicating that collateral and bankruptcy laws are better designed to expand access to credit. The disadvantage of this index is that it is not specific to the manufacturing sector on which this study focuses.

Table 2.1 shows that Kenya has better legal rights for borrowers and lenders compared to Uganda and Tanzania. Interestingly Uganda and Tanzania are ranked equally on the basis of this index.

Table 2.1: Legal Rights Index

Kenya	Uganda	Tanzania
8	5	5

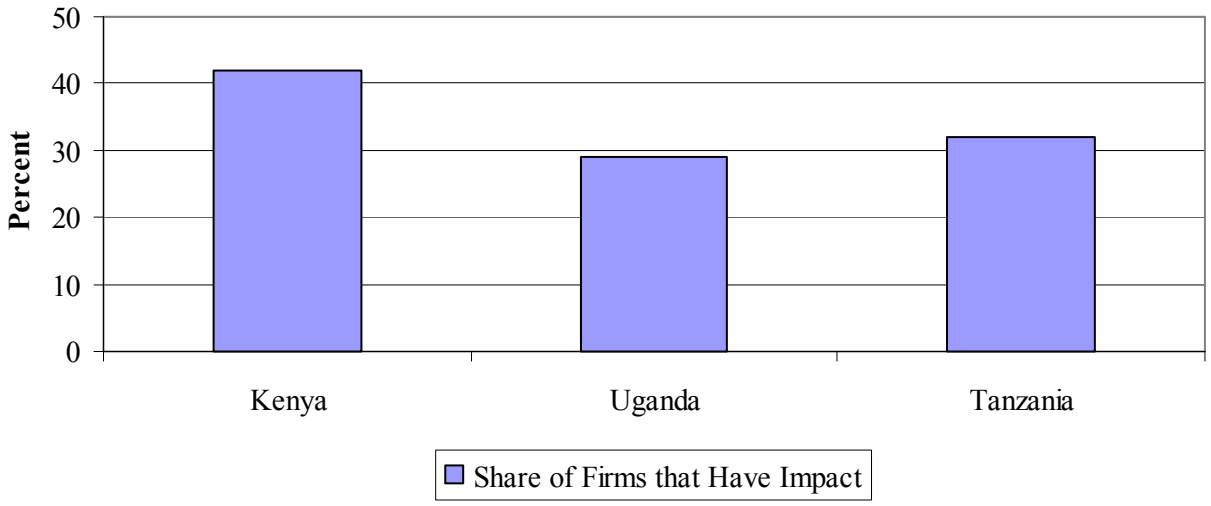
Source: World Bank (2005), Doing Business in 2005 Database

Based on the 2 indicators it can be concluded that Kenya has the best quality legal system in terms of legal content. This is clear with reference to financial markets in particular based on the Legal Rights Index.

2.5.2 Cost of Enforcement Indicators

Enforcement is measured by responses to a question about the impact of bribes paid to judges on the outcome of commercial court cases. Using a scale ranging from 0 (no impact) to 4 (decisive impact), firms were asked to state the extent to which bribes to judges affected the outcome of commercial court cases. A greater impact of bribes on judicial decisions suggests a higher prevalence of corruption. This would lead to higher enforcement costs. Figure 2.2 shows that Kenya has a significantly higher share of firms that impact court decisions through bribes to judges.

Figure 2.2: Share of Firms that Impact Court Decisions by Bribing Judges (%)

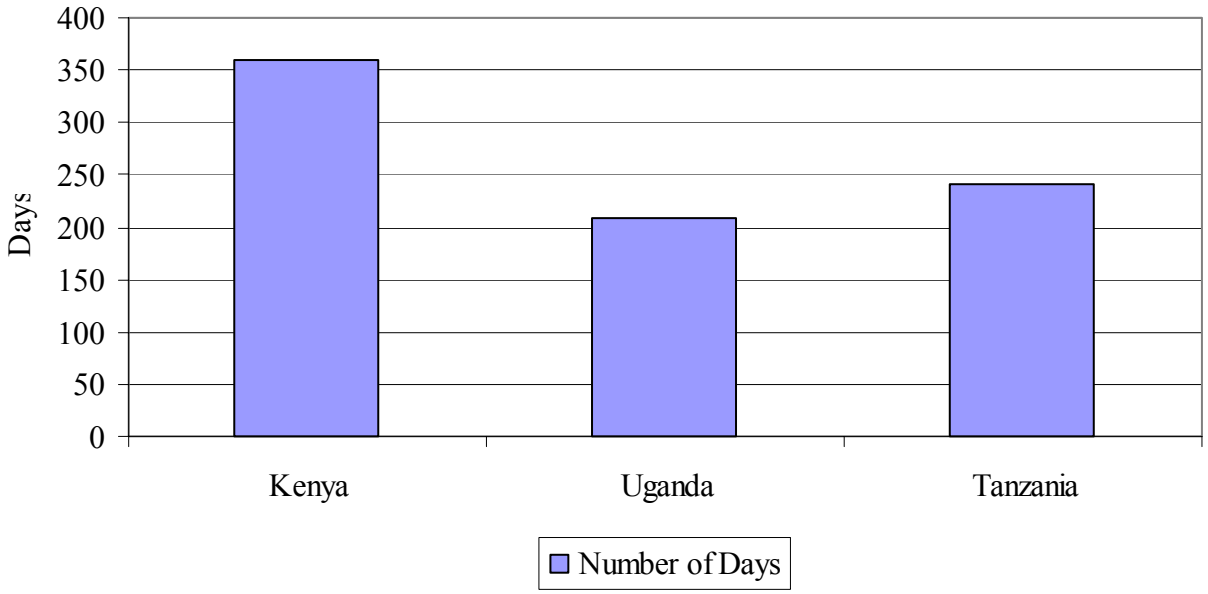


Source: World Bank (2002/03), Investment Climate Surveys
Kenya (n=193) Uganda (n=159) Tanzania (n=108)

Uganda has the lowest share of just below 30 percent. Similar to the content of law indicator taken from the ICA survey data, this measure is not specific to credit markets. Therefore, the study makes use of other measures of enforcement costs that are specific to credit markets. These are (a) the number of days it takes to recover overdue debt through the courts and (b) the cost of enforcement as a percentage of outstanding debt. These indicators are obtained from the Doing

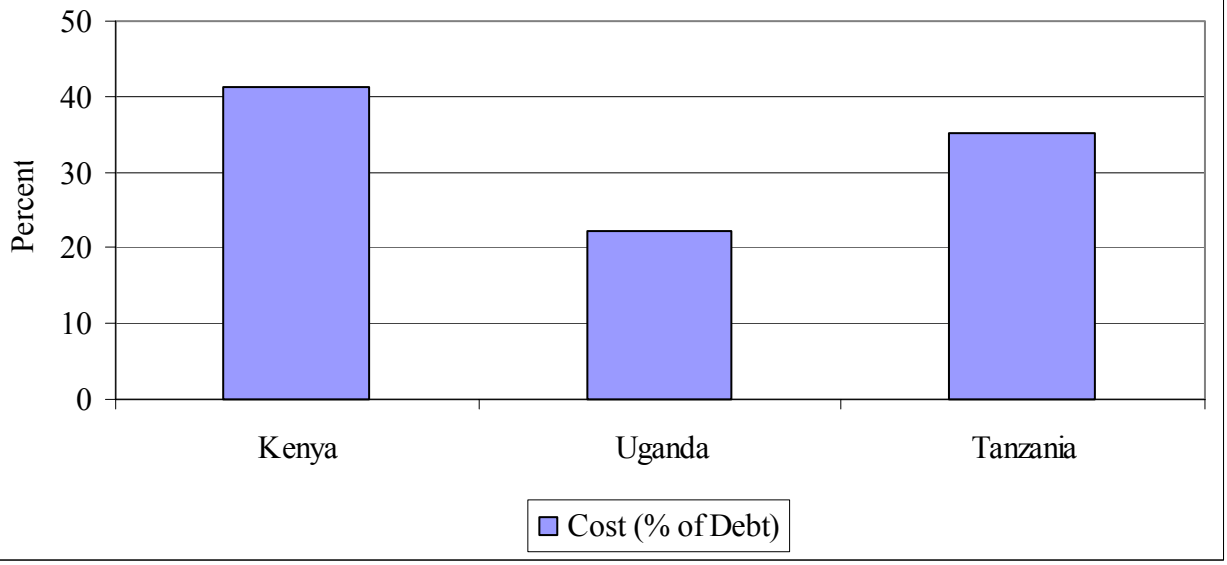
Business Survey. Figure 2.3 and Figure 2.4 show that Kenya has the highest enforcement costs in terms of time and financial cost. This is consistent with the high prevalence of corruption in the Kenyan judiciary that one observes in Figure 2.2. Enforcement costs are least in Uganda based on both the days to recover overdue debt and on the share of debt required to enforce contracts.

Figure 2.3: Number of Days to Recover Overdue Debt through Courts



Source: World Bank (2005), Doing Business in 2005 Database

Figure 2.4: Cost of Enforcing Contract (% of Debt)



Source: World Bank (2005), Doing Business in 2005 Database

The legal indicators show that Kenya has the most well developed legal system in terms of legal content. Tanzania appears to have the least developed system with respect to legal content, though only marginally different from Uganda. However, enforcement costs are higher in Kenya compared to Uganda and Tanzania. Uganda has the lowest enforcement costs based on all the indicators. These observed differences can not be used to conclude that one country has a better legal system than another. Both the written law and cost of enforcement are critical components for a legal system that enables financial decisions to take place. In chapter 3 an investigation of the collateral mechanism provides more insight into the importance of enforcement costs.

2.6 Testing of Hypotheses

The previous section described the indicators that are used to measure the quality of the written law and the costs associated with enforcement. In this section a descriptive analysis based on 5 hypotheses is undertaken.

Hypothesis 1: Better quality legal content is associated with greater access to bank finance and trade credit.

Rationale: Borrowers will be more capable of pledging collateral where their rights over assets are more clearly defined. In addition, better defined rights over collateral for creditors will lead to greater provision of bank finance. Based on the 'redistribution' view (see Love et al, 2005) it is expected that higher levels of bank finance will be associated with greater provision of trade credit. Firms successful in securing bank finance 'redistribute' it to firms unable to do so in the form of trade credit. Hypothesis 1 is tested by assessing the relationship between the content of law indicators and measures of access to bank credit and trade credit.

Hypothesis 2: More efficient enforcement of debt contracts is associated with greater access to bank finance and trade credit.

Rationale: Banks will be more willing to lend in an environment where the costs associated with repossessing collateral are low. Again the 'redistribution view' suggests that the greater willingness of banks to extend credit will be associated with higher levels of trade credit. In addition, because firms use the courts to settle disputes over trade credit disputes, a more efficient legal system will be characterized by greater access to trade credit. Hypothesis 2 is

tested by examining the relationship between the cost of enforcement indicators and measures of access to bank finance and trade credit.

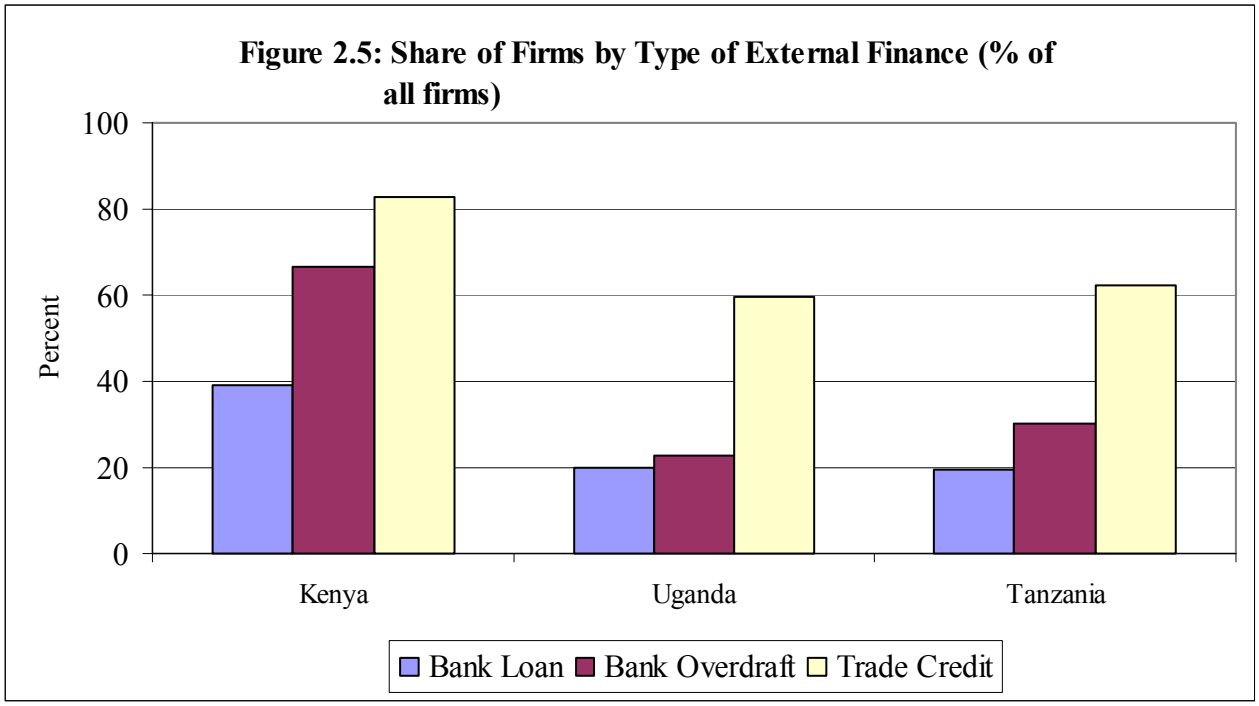
It would be useful to assess whether the differences in the legal indicators from the ICA data are statistically significant across countries. Hypotheses 1 and 2 are based on the premise that the quality of the written law and legal enforcement are significantly different across countries. However, no appropriate test was found for this purpose. Difference in means tests appear the most intuitive. However, when these tests are done using t-scores and z-scores they require continuous data. The variables used in this chapter are dichotomous (e.g. interpretation of government laws is either consistent or not consistent; firms either have a loan or don't have a loan).

The alternative would be to use non-parametric tests that deal with dichotomous variables. These tests include the Fisher exact test, the Cochran Q test and the McNemar change test (see Conover, 1980 and Siegel and Castellan Jr., 1988). Although the Fisher exact test considers independent samples (independence is a plausible assumption when looking at 3 different countries), it requires 2 factors and 2 categories. For example size (small and large) and age (young and old). The comparisons in this chapter are not structured in this way. On the other hand, the Cochran Q test and the McNemar change test are conducted on related samples, usually looking at before and after effects on the same sample. Other non-parametric tests such as the Wilcoxon test require that the data are ordinal. Given these limitations on available tests, the comparison of variables is done without making any conclusion about whether the observed differences are significant.

Figure 2.5 shows that a far larger proportion of Kenyan firms have access to bank finance in the form of ordinary loans and overdrafts compared to Ugandan and Tanzanian firms. It also shows that Kenyan firms have greater access to trade credit. The greater access to external finance in Kenya is partly a result of Kenya having larger firms compared to the other countries and a higher level of financial development (see Tables 1.4, 1.5 and 1.8). There are clearly factors not directly related to the legal environment that influence access to external finance.

The share of Ugandan and Tanzanian firms with access to bank loans and trade credit is fairly similar. However Tanzanian firms appear to have marginally better access to overdraft facilities than Ugandan firms. Figure 2.5 suggests that in the context of the EAC, where legal content is

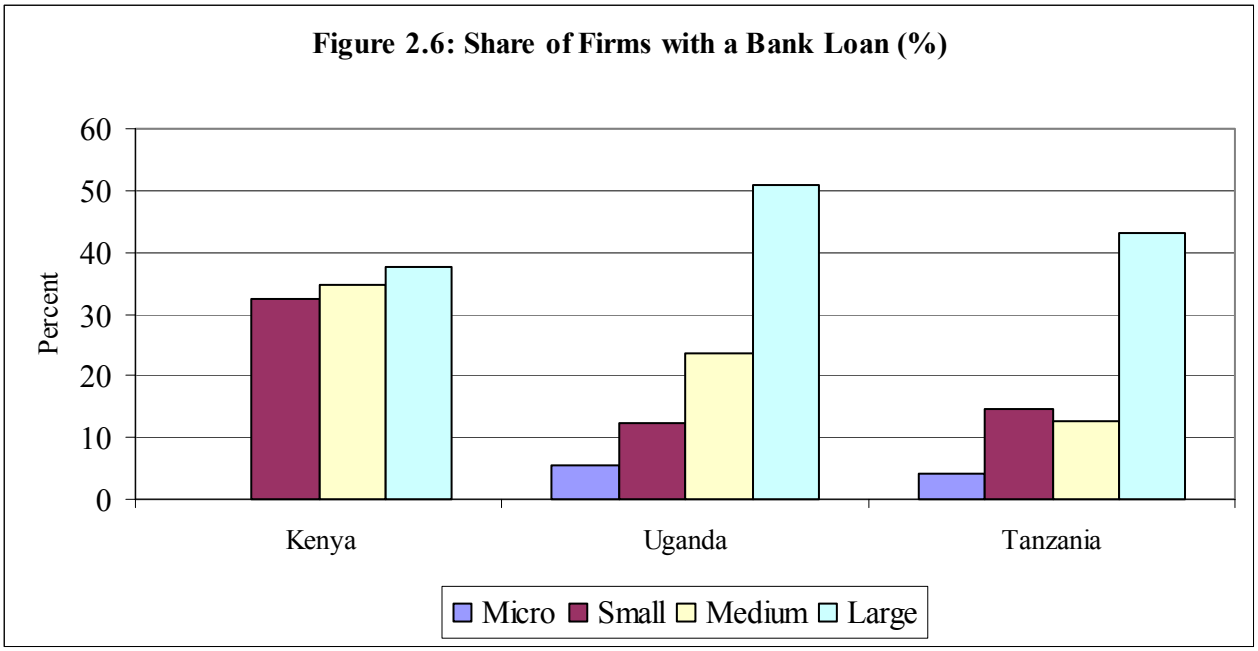
superior (Kenya) access to external finance greater. This supports hypothesis 1. It is an important finding given that emphasis is normally placed on enforcement in the literature (for example Cristini et al, 2001; Japelli et al, 2005). Factors external to the legal environment contributing to greater access in Kenya have been mentioned in the previous paragraph and in chapter 1.



Source: World Bank (2002/03), Investment Climate Surveys
Kenya (n=247) Uganda (n=299) Tanzania (n=272)

It is also interesting to examine how access to external finance varies by size in the three EAC countries. Micro firms in Uganda and Tanzania have better access to bank loans compared to Kenyan firms as shown by Figure 2.6.

Figure 2.6: Share of Firms with a Bank Loan (%)

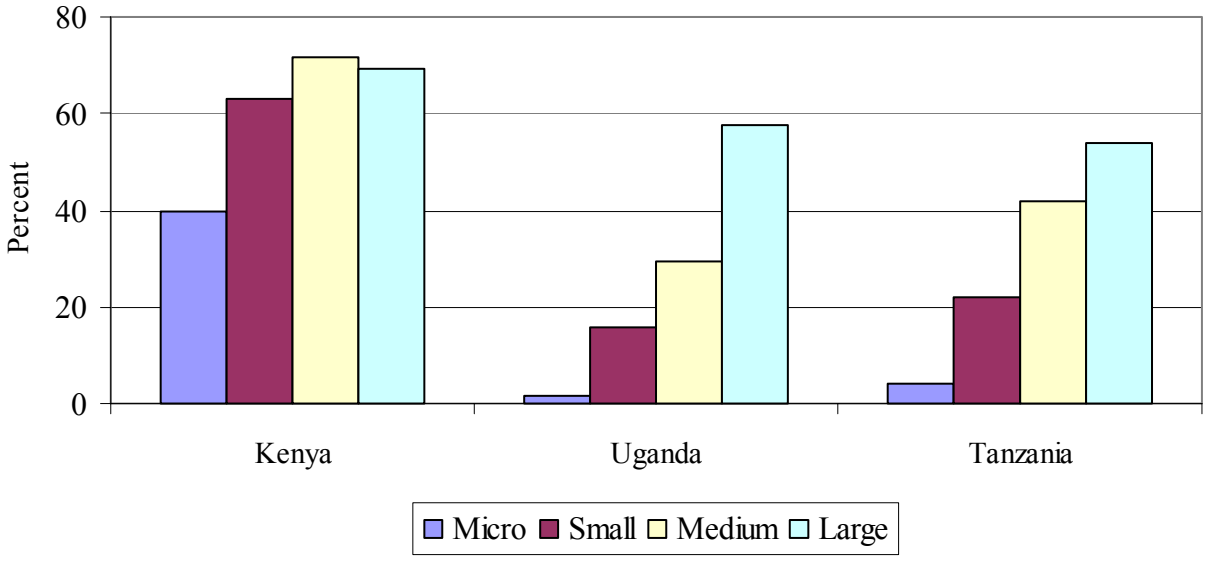


Source: World Bank (2002/03), Investment Climate Surveys
Kenya (n=237) Uganda (n=300) Tanzania (n=270)

The observation that no Kenyan micro firms have a bank loan may reflect the significant presence of large firms in Kenya, and that micro firms are unable to compete with these large firms for bank credit. It may also be that micro firms in Kenya have no demand for loans. However for small, medium and large firms, Kenyan firms have far greater access to bank loans relative to their counterparts. Access to bank loans increases with size in all 3 countries.

Although Kenyan micro firms do not obtain ordinary bank loans Figure 2.7 shows that 40 percent of these firms have access to overdraft facilities. In contrast only 2 percent of Ugandan micro firms and 4 percent of Tanzanian micro firms have an overdraft facility. Similarly to the trend with ordinary bank loans, there is a general increase in access to overdrafts with size in the 3 countries.

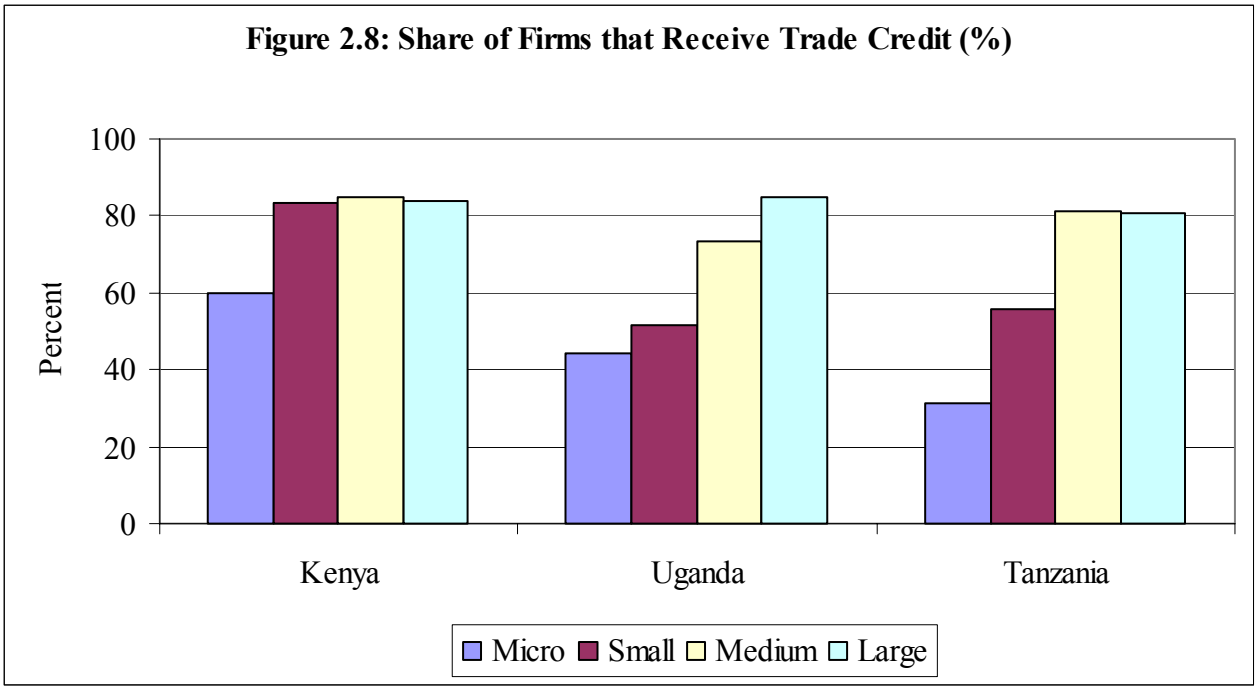
Figure 2.7: Share of Firms with Overdraft (%)



Source: World Bank (2002/03), Investment Climate Surveys
Kenya (n=244) Uganda (n=300) Tanzania (n=262)

Figure 2.8 shows that amongst micro firms, trade credit is used least in Tanzania. It is also in Tanzania that it is used least amongst large firms. However, in the small and medium sized categories, Ugandan firms use trade credit the least. Notably, for all size groups Kenyan firms use trade credit more than Ugandan and Tanzanian firms. This supports the 'redistribution' view. Greater access to bank credit is associated with more use of trade credit. In addition, there is a general increase in the use of trade credit with size. This is despite the fact that large firms are most likely to have collateral to pledge for bank loans. Large firms may also have better access to internal sources of finance. Smaller firms with the least collateral and less internal resources may benefit from better access to trade credit.

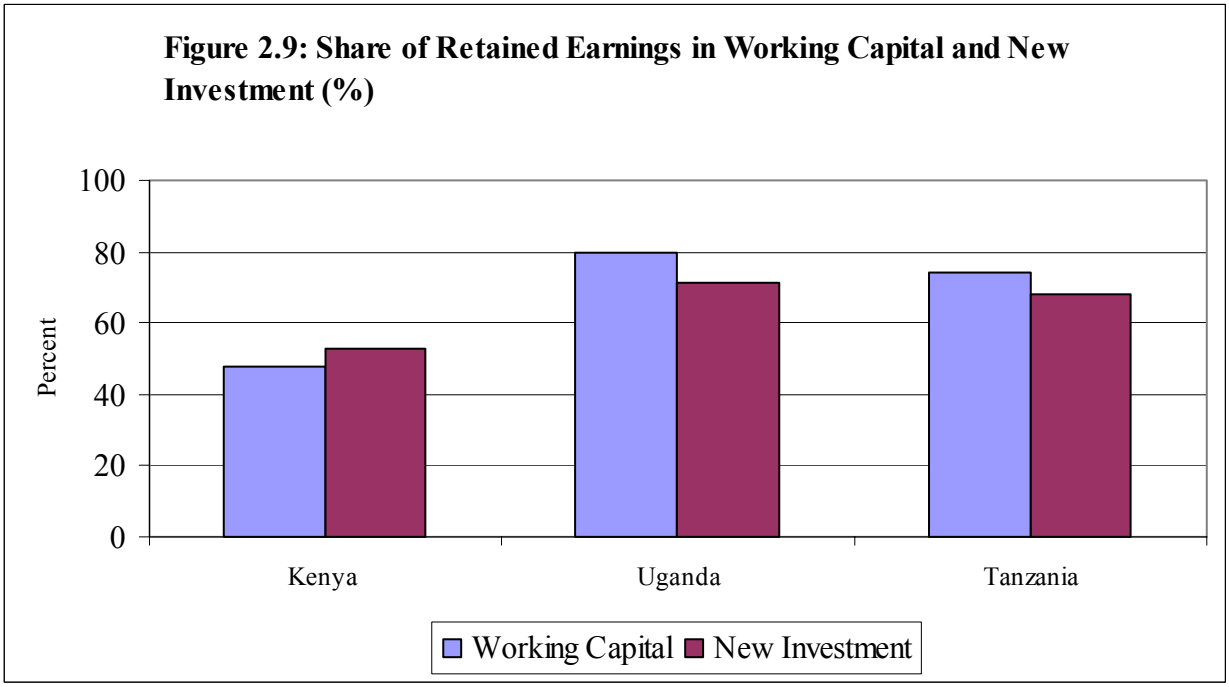
Figure 2.8: Share of Firms that Receive Trade Credit (%)



Source: World Bank (2002/03), Investment Climate Surveys
Kenya (n=247) Uganda (n=299) Tanzania (n=272)

Given the fact that Kenyan firms have greater access to bank finance and trade credit, it is not surprising that they rely less on internal sources of finance for their working capital and investment needs. Figure 2.9 shows that Ugandan and Tanzanian firms depend more heavily on retained earnings to finance working capital and new investment.

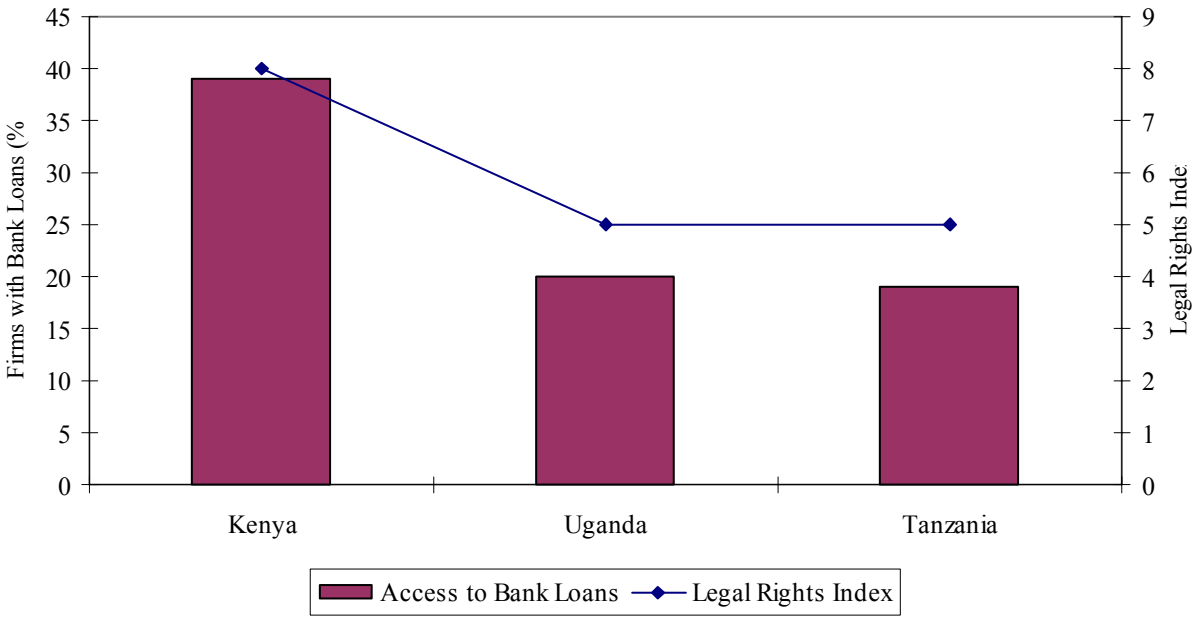
Figure 2.9: Share of Retained Earnings in Working Capital and New Investment (%)



Source: World Bank (2002/03), Investment Climate Surveys
Kenya (n=172) Uganda (n=202) Tanzania (n=166)

The evidence supports the first hypothesis. It appears that better quality legal content is positively associated with access to external finance. This is captured by the positive relationship depicted in Figure 2.10.

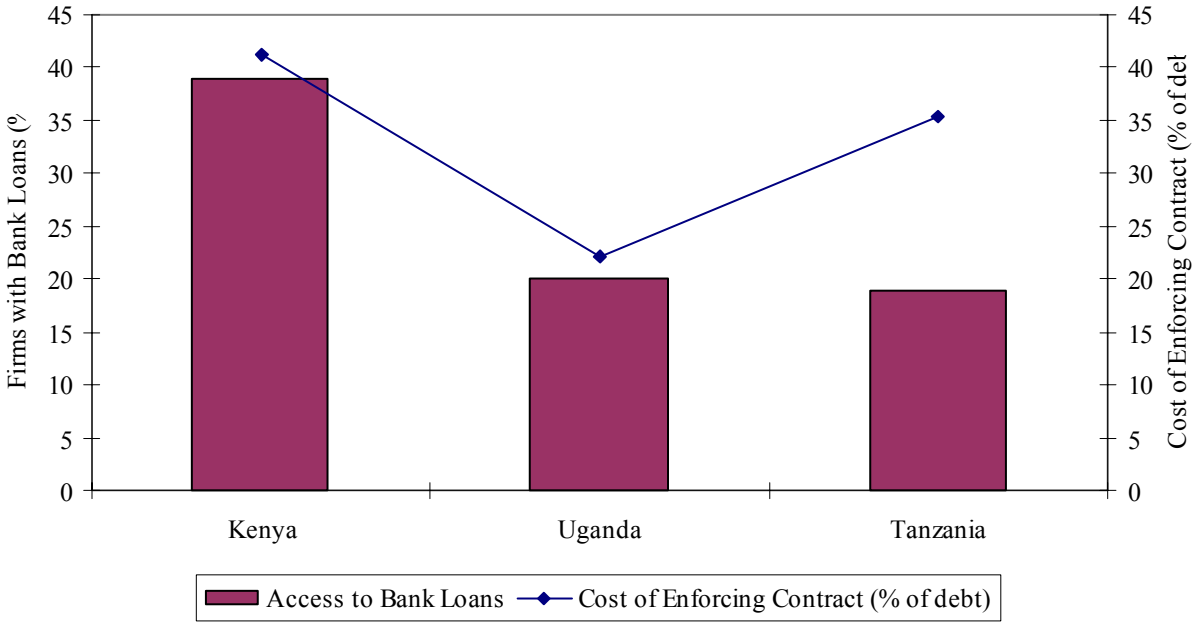
Figure 2.10: Access to Bank Loans versus Legal Content



Source: World Bank (2002/03), Investment Climate Surveys and World Bank (2005), Doing Business in 2005 Database
Kenya (n=237) Uganda (n=300) Tanzania (n=270)

However, the second hypothesis can not be accepted on the basis of our evidence. There is no indication that low enforcement costs are associated with better access to external finance. This is shown by Figure 2.11. Kenya which has the highest enforcement costs also has the most access to bank finance and trade credit.

Figure 2.11: Access to Bank Loans versus Cost of Enforcement



Source: World Bank (2002/03), Investment Climate Surveys and World Bank (2005), Doing Business in 2005 Database
Kenya (n=237) Uganda (n=300) Tanzania (n=270)

This result is interesting in the sense that in order for superior creditor rights to meaningfully affect access to external finance, those rights must be effectively enforced. It was emphasised in chapter 1 that legal content and legal enforcement are equally important for the functioning of credit markets. There are likely to be other factors behind the observed differences in access to external finance in the EAC other than the legal environment. The discussion in section 2.6 will consider some of these factors.

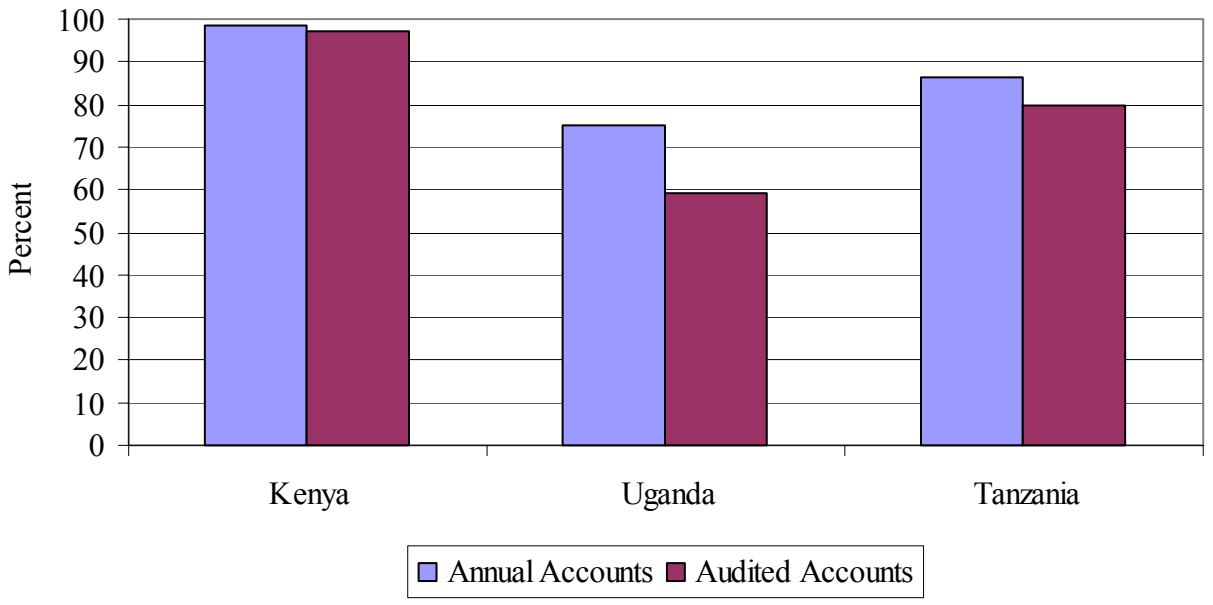
Hypothesis 3: Better quality legal content is associated with less information asymmetry.

Rationale: If the law clearly defines the rights of creditors over information about their debtors there will be less information asymmetry between the two parties. This information serves a critical role in the decisions taken by creditors.

Hypothesis 3 is tested by investigating the relationship between the content of law indicators and measures of information availability. The measures of information availability from the ICA are the share of firms that keep annual accounts and the share of firms that have their accounts audited by an outside agency. Figure 2.12 shows that Kenya has the best financial information

available compared to Uganda and Tanzania. Less than 60 percent of Ugandan firms have their accounts audited.

Figure 2.12: Share of Firms with Financial Accounts (%)



Source: World Bank (2002/03), Investment Climate Surveys
Kenya (n=253) Uganda (n=296) Tanzania (n=271)

Use is made of the credit information index from the Doing Business survey. The index is measured on a scale of 0 to 6, with higher values indicating that more credit information is available from either a public registry or a private bureau to facilitate lending decisions. From Table 2.2 one sees that credit information is extremely poor in Uganda and Tanzania. However, Kenya has relatively good credit information available.

Table 2.2: Credit Information Index

Kenya	Uganda	Tanzania
5	0	0

Source: World Bank (2005), Doing Business in 2005 Database

The evidence supports hypothesis 3. In the case of the EAC, better quality legal content is associated with better availability of financial information. Strong creditor rights place pressure on firms to keep good quality financial records. More lending takes place in this environment.

The relative ease of information flow in Kenya means that debtors can be more easily disciplined by means other than the formal collateral channel. Thus, although enforcement costs are high, debtors in Kenya would work hard to protect their reputations. The availability of financial information partly explains why high enforcement costs in Kenya coexist with relatively high access to bank finance.

Hypothesis 4: Better quality legal content is associated with lower collateral constraints.

Rationale: If the content of the law is of high quality then banks will have greater confidence that their rights as creditors are protected. They will be less worried that default is associated with non-recovery of the loans they have extended. Therefore, banks will be less prone to using collateral requirements as a means of preventing firms from obtaining loans.

To test hypothesis 4 the study examines measures of collateral constraints. These measures are: the share of firms that did not apply for a bank loan due to inadequate collateral and the number of firms whose loan applications were rejected because of inadequate collateral. Table 2.3 shows these measures for the 3 countries. In Uganda the share of firms not applying for loans due to inadequate collateral is more than twice as high as it is in Kenya. Although the corresponding figure for Tanzania is not available, it is likely that the Tanzanian share is close to what is observed in Uganda given the similarities observed between the two countries thus far[12]. Tanzania has the largest share of firms whose loan applications are rejected due to inadequate collateral. This share is again twice as high in Uganda as it is in Kenya. Table 2.3 suggests that collateral constraints in Kenya are less severe compared to Uganda and Tanzania.

[12] The survey data on Tanzania does not allow us to calculate this share. However approximately 50 percent of Tanzanian firms indicated that collateral was one of the factors affecting their decision of whether or not to apply for a bank loan.

Table 2.3: Collateral and Bank Finance (%)

	Firms not applying (% of all firms)	Applications rejected (%)
Kenya	4	1.6
Uganda	10	3.3
Tanzania	-	10.7

Source: World Bank (2002/03), Investment Climate Surveys
Kenya (n=228) Uganda (n=300) Tanzania (n=270)

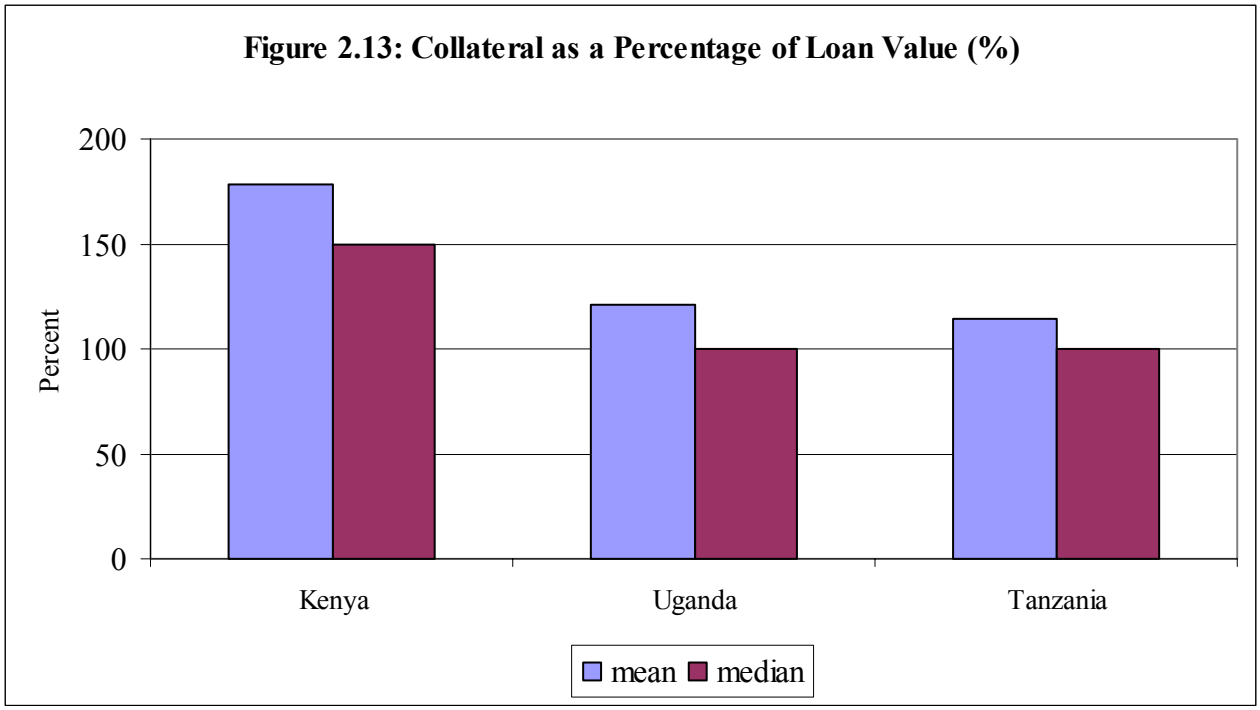
The little evidence available supports the hypothesis that better quality legal content is associated with lower collateral constraints.

Hypothesis 5: More costly legal enforcement is associated with higher collateral requirements.

Rationale: Banks will factor the cost of enforcement into the collateral requirements they place on firms. This implies that other things held constant, Kenya will have the highest collateral requirements. If enforcement costs can be incorporated into collateral requirements banks will still be willing to lend. This may partly explain the earlier finding of better access to bank finance in Kenya even though enforcement costs are very high.

Figure 2.13 shows that the average collateral-to-loan value in Kenya is higher than in the other countries. The hypothesis that more costly enforcement is associated with higher collateral requirements is supported by the data.

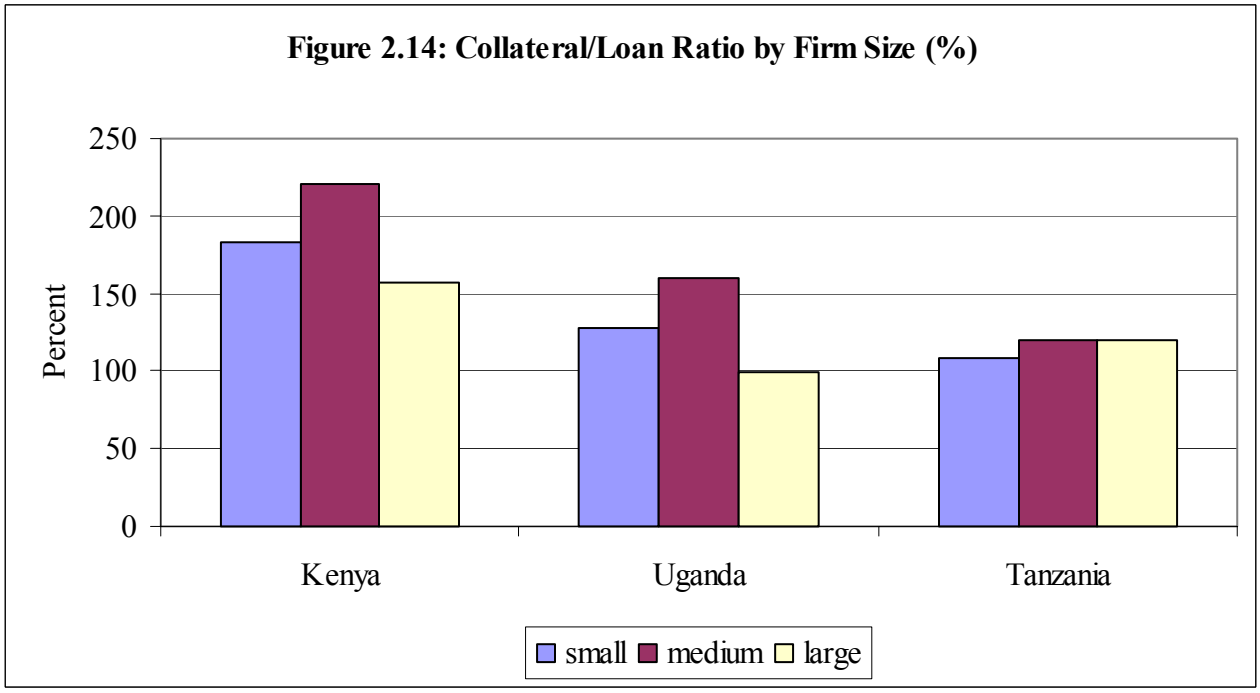
Figure 2.13: Collateral as a Percentage of Loan Value (%)



Source: World Bank (2002/03), Investment Climate Surveys
Kenya (n=78) Uganda (n=50) Tanzania (n=45)

For every size group the collateral-to-loan ratio is higher in Kenya than in Uganda and Tanzania as shown in Figure 2.14. For Kenya and Uganda medium firms face the highest collateral requirements. In the case of Tanzania medium and large firms face similar requirements.

Figure 2.14: Collateral/Loan Ratio by Firm Size (%)



Source: World Bank (2002/03), Investment Climate Surveys
Kenya (n=78) Uganda (n=50) Tanzania (n=45)

Hypothesis 6: Better quality legal content is associated with longer maturity for bank loans and trade credit.

Rationale: When banks have better protection against risk through the collateral mechanism they will be less concerned about putting borrowers on a 'short lease' in terms of loan maturity. Firms will typically enjoy loans of longer maturity when creditor rights are strong. The terms on which firms secure bank finance could in turn affect the terms on which they provide trade credit. Firms may choose to 'redistribute' trade credit in line with the maturity of their bank credit.

There is no evidence to support the hypothesis that better quality legal content is associated with longer maturity. According to Table 2.6 there are no meaningful differences in bank loan maturity across the 3 countries, although maturity in Tanzania is slightly lower relative to the other 2 countries. There is also no support for the argument that trade credit maturity is affected by bank credit maturity. No identifiable pattern can be seen between the 2 maturities shown in Table 2.6.

Table 2.6: Maturity on Bank Loans and Trade Credit

	Kenya	**Uganda**	**Tanzania**
Loan (years)	3.69	3.71	3.26
Trade Credit (days)	56.5	33.5	45.8

Source: World Bank (2002/03), Investment Climate Surveys
Kenya (n=93) Uganda (n=42) Tanzania (n=53)

2.7 Further Discussion of Results

In line with the findings of previous work, the descriptive analysis does present some evidence supporting the argument that the quality of the legal system has an important relationship with access to external finance and the terms of this finance. This chapter has investigated this relationship using several hypotheses. The analysis suggests that the content of law is important for access to external finance. Kenyan firms have greater access to bank loans, overdraft facilities and trade credit. It appears that the protection of creditor rights is relatively more important than the cost of enforcing these rights through a court of law. This is consistent with Acemoglu and Johnson (2005) who argue that property rights institutions are more important than contracting institutions for the functioning of financial markets. However, high enforcement

costs do make the sourcing of bank finance extremely costly as shown by the strikingly high collateral requirements in Kenya.

The Kenyan results are taken with caution for several reasons. First, as chapter 3 will show, collateral turns out to be insignificant for access to bank finance in Kenya. This suggests that the superior creditor protection is not what drives the better access to bank finance that is observed. If creditor protection over collateral was important, collateral would have a meaningful effect on banks' decisions to extend loans. Second, the analysis does not control for other factors that impact access to external finance. According to Haas (2004) this is a major weakness of the law and finance literature. Factors such as bank supervision, natural endowments, political stability, the level of economic development, and social capital are likely to be important. These factors are likely to be behind the interesting observation that although contract enforcement costs are highest in Kenya, Kenyan firms still have the most access to external finance. For example, because Kenya has historically enjoyed a higher level of economic development than in Uganda and Tanzania, access to external finance will be more favourable for Kenyan firms even if legal enforcement in Kenya is of poor quality. Furthermore, the analysis in this chapter has not controlled for firm size, an important determinant of access to credit.

Third, the analysis can not claim that causality runs in any particular direction. For example, greater access to credit in Kenya increases the likelihood that disputes over financial contracts will arise. A greater demand for court services in Kenya for the resolution of these conflicts may be the reason behind the high enforcement costs observed in that country. It is also possible that the superior creditor rights in Kenya are a response to the expansion of the formal credit market, rather than a cause of this expansion.

Creditor protection in Kenya appears to work through the information channel rather than through collateral. The content of the law is positively associated with the availability of financial information as expected. Kenya has the largest share of firms keeping financial records and that have these records audited by an outside agency. Based on the credit information index access to credit information in Kenya is good with a score of 5 out of a possible 6. Notably Uganda and Tanzania have the lowest possible score. There is an indirect effect of the quality of the legal system on access to external finance. Better legal protection leads to better financial information, which in turn has a positive effect on access to external finance. This financial

information will be important as a collateral substitute in Kenya given the ineffectiveness of traditional collateral in affecting bank lending.

The legal environment relates strongly to collateral requirements through the cost of enforcement. Kenya has significantly higher collateral requirements than Uganda and Tanzania. Banks appear to factor in the cost of debt recovery via legal channels into the collateral requirements they place on firms. Thus, the terms of bank credit are dependent on the legal system. Nevertheless, collateral constraints appear to be least severe in Kenya. This finding is interesting given that collateral requirements are highest in Kenya. It suggests that in reality collateral is not important for access to bank finance for Kenyan firms as will be shown in chapter 3. If it were, then the high requirements would translate into poor access to bank loans. Notably, the country where the legal content is weakest (Tanzania) seems to have the most severe collateral constraints. Creditor rights appear to be important for the extent to which banks are willing to use collateral as an enforcement mechanism in that country.

It must be pointed out that although the evidence supports the hypothesis on the relationship between enforcement costs and collateral requirements, there are other factors that can affect the observed collateral requirements. First, the indivisibility of collateral increases the likelihood of high collateral-to-loan ratios for small loans (Isaksson, 2002a) Second, the absence of secondary markets for capital goods makes it difficult to correctly value assets pledged as collateral. While these factors are important, they are unlikely to undermine the study's argument. The impact of enforcement costs must be present if the large difference observed between Kenya and the other 2 countries is to be adequately explained.

Average loan maturity has no significant difference across the 3 countries. The evidence in this chapter does not support the idea that poorer protection of creditor rights is associated with banks putting borrowers on a 'short leash'. The analysis provides no evidence supporting the argument that bank finance maturity has an impact on trade credit maturity. Other factors such as the relationship between firms are likely to be of more importance when agreeing on trade credit terms, than the terms on which firms are able to secure bank finance. The observation that Kenya has significantly longer maturity for trade credit (although not for loans) could be indicative of strong network effects, or of a relatively greater tendency for payments to be delayed. Weaker enforcement in Kenya may promote opportunistic behaviour by firms using trade credit. This issue is considered in chapter 4.

2.8 Conclusions

There exists a large body of empirical evidence showing that the quality of the legal system affects access to external finance. More recently attempts have been made to develop theoretical models to explain this relationship. Despite the importance of these works in explaining how the institutional framework affects financial markets, there has been little work examining how the legal system relates to access to finance at the micro level, particularly in the context of African countries. This chapter takes a step to address this gap using the EAC as a case study.

Proxies on the quality of the legal system focusing on two aspects - the content of the law and the enforceability of the law – were presented. These proxies were then compared against measures of access to bank finance and trade credit. The analysis indicated that in the case of the EAC the content of the law is important for overall access to external finance. In particular, the evidence showed that better quality legal content is associated with a significantly lower level of information asymmetry. This means that better legal protection is associated with greater access to external finance partly because it promotes the flow of information between creditors and borrowers.

No evidence was found to suggest that enforcement costs affect access to external finance. This is partly because the chapter does not isolate this effect explicitly. An attempt to do this is made in chapter 3 by investigating the collateral mechanism. Moreover, there are other factors that affect access to external finance such as the level of economic and financial development, and firm size which need to be kept in mind when interpreting the results. Also important to note is that based on the analysis in this chapter the author is unable to claim causality running from legal environment to access to external finance.

In addition, this chapter assessed the correlation between the quality of the legal system and the terms of bank finance and trade credit. It was found that higher enforcement costs are strongly correlated with higher collateral requirements. No evidence was found supporting the view that better legal content allows firms to enjoy longer maturity on their loans. Network effects and opportunistic behaviour in an environment of weak enforcement may explain trade credit maturity.

CHAPTER 3: COLLATERAL, COLLATERAL SUBSTITUTES AND ACCESS TO BANK FINANCE

3.1 Introduction

A key channel through which the legal system ensures the flow of credit is by protecting creditor's rights over collateral and enforcing those rights in the event of default. Where the legal system is effective, the likelihood that firms will be able to access bank finance increases with their ability to offer collateral. This means that collateral is critical to the first part of the transmission mechanism explained in chapter 1. However, Nkurunziza (2005b) argues that given the poor quality of legal systems in SSA, collateral is an irrelevant enforcement mechanism. The weakness of the legal system is compounded by the thinness of secondary markets for capital goods in these countries. Empirical evidence on the role of collateral in developing countries is extremely limited (Menkhoff, 2004). It is therefore a useful exercise to explore further the significance of collateral for access to bank finance by manufacturing firms in SSA. To the best knowledge of the author this is the first effort to empirically examine the impact of collateral on access to bank finance for a group of African countries.

In chapter 2 it was observed that the legal systems in the 3 countries have some important differences. Kenya has the most well defined creditor rights but by far the most costly contract enforcement. Creditor rights appear poorest in Tanzania while Uganda is most efficient with respect to enforcement. It was also observed that collateral constraints are more severe in Tanzania and Uganda relative to Kenya. In this chapter an investigation is made into the implications of collateral use in light of these differences.

The use of collateral substitutes can be effective in an environment where enforcement is weak or where firms do not have sufficient collateral. The literature review will show that these substitutes include reputation, relationship lending, financial records, and ethnicity. This chapter will add to the existing knowledge on the importance of different collateral substitutes for credit access in SSA. In particular, to the best knowledge of the author this is the first attempt using firm level data to investigate how relationship banking affects access to bank finance in the context of SSA.

3.2 Literature Review

In this section a review of literature on the role of collateral and collateral substitutes in financial agreements between banks and borrowers is made.

3.2.1 The Role of Collateral

According to Fleisig and de la Pena (2003), the key economic feature of collateral and a lending system based on collateral lies in granting priority to a creditor in recovering credit through some property belonging to the debtor. This requires that the creditor has a secured interest; that is a "right of satisfaction" from the property. In the event of default, the creditor with a secured interest has priority over the general claims of unsecured creditors to sell the item pledged as collateral in order to recover the loan. In a collateralized system creditors must have the legal right to take possession of assets over which others have ownership rights.

The analysis of credit constraints faced by borrowers with a demand for bank loans is to a large extent based on the premise of information asymmetry. According to Stiglitz and Weiss (1981), credit rationing can obtain as an equilibrium outcome in light of adverse selection and moral hazard. Berger and Udell (2002) explain that firms with profitable investment opportunities are unable to pursue them because potential providers of outside finance cannot verify the quality of the project (adverse selection), or ensure that funds are not used to finance other riskier projects that were not considered by the supplier of funds (moral hazard).

Earlier literature on collateral viewed it as a disincentive for the borrower faced with the option of defaulting on a loan (Barro, 1976; Benjamin, 1978). Under this argument collateral increases the probability that the lender will recover the loan by making default costly. In more recent times the use of collateral in credit markets has been motivated as a means to alleviate information asymmetries. These two views are highly correlated: the more acute the information asymmetry between the borrower and the bank, the more likely the firm is to default. Under specific conditions collateral can effectively substitute for information (Isaksson, 2002b). The conditions suggested are: the legal system functions properly, the value of collateral is adequate, and the collateral value is not eroded over time.

In financial markets characterized by adverse selection collateral can signal a high credit quality borrower to the lender. When borrowers know their credit quality but lenders do not, the likelihood that collateral is pledged is higher for borrowers of superior credit quality (Bester, 1985; Chan and Kantas, 1985; Besanko and Thakor, 1987). Theories of collateral based on adverse selection predict that collateral is associated with high quality borrowers, who use collateral to send a signal to the lender. Banks offer potential borrowers two different types of contracts to select from: one with collateral and low interest rates, and one with no collateral and a high interest rate. High quality borrowers will select the contract with collateral so as to enjoy the lower interest rate. Low quality borrowers choose the contract with the high interest rate.

In contrast, in the presence of moral hazard it is the poor quality borrowers who are more likely to be required to pledge collateral. Boot, Thakor and Udell (1991) show that when information asymmetry is present in the form of hidden action, low quality borrowers obtain loans that require collateral while good quality borrowers get loans without collateral. When financial markets have moral hazard problems collateral gives the borrower an incentive to apply effort and reveal the actual state of his project to the bank after securing the loan (Bester, 1987, 1994).

As Balkenhol and Schutte (2001) point out, small borrowers lack assets of sufficient market value to pledge as collateral. Similarly, Berger and Udell (1998) explain that bank lending is not easily accessible to small firms because their balance sheets do not reflect adequate tangible assets that can be pledged as collateral. These firms undergo a financial growth cycle. Smaller firms, which are generally younger and informationally opaque, rely heavily on inside finance. Growth over time allows access to private external equity and private debt (banks, finance companies) and ultimately to public equity and debt markets. This implies that a small firm's probability of securing an external debt contract is positively related to the value of collateralizable assets.

The need for collateralized lending can be reduced by improving information available on borrowers. Theories of financial intermediation emphasize that banks are characterized by scale economies and/or comparative advantage in generating information about borrowers (Diamond, 1984, 1991; Boyd and Prescott, 1986). As a result of this unique ability, banks will specialize in lending to borrowers where information asymmetry is particularly acute. However, we observe that relative to other sources of finance, banks rely most on collateralized lending. This dependence on collateral may actually reduce the incentive for banks to collect information on

borrowers. Manove et al (2001) argue that in the presence of asymmetric information the use of collateral in debt contracts may reduce the screening effort of banks leading them to fund a high proportion of poor quality investment projects.

3.2.2 Collateral Substitutes

In this section the literature on key collateral substitutes is reviewed. In the context of Africa, Bigsten et al (2003) suggest that ethnicity, legal status, ownership structure, networks, firm age, keeping of records, and links with the financial sector can serve as collateral substitutes for firms requiring bank finance. Similarly, in a study on access to credit by the Micro and Small Enterprise (MSE) sector in Kenya, Kimuyu and Omiti (2000) consider legal status, ethnicity, networks, firm age, ownership structure and links with financial institutions as potential collateral substitutes for small firms in Kenya. Literature supporting the suggestions of these authors is examined.

3.2.2.1 Reputation

Although it is an intangible asset, reputation is valuable for a firm. A firm's name sends a message to the market about the reputation of the firm (Tadelis, 1999). Kreps and Wilson (1982) were among the first to formally demonstrate that markets characterised by imperfect information give rise to reputation effects. Diamond (1989) examines the role of reputation in debt markets. He argues that reputation is built from observing over time the behaviour of certain exogenous characteristics of a borrower. He finds that the value of reputation in debt markets increases in the presence of asymmetric information. In the presence of significant information asymmetry a good reputation will over time reduce the incentives of borrowers to select high-risk projects.

An infinitely repeated game model developed by Martinelli (1997), predicts that the length of a small firm's credit history will be negatively correlated with the interest rate it faces and positively correlated to the size of the loan it gets from lenders. A longer relationship allows the firm to build reputation based on repeated interaction with the lender. The model ignores the possibility of using collateral as a way of accurately describing the evolution of small business credit terms.

Nkurunziza (2005b) argues that in African countries collateral is a poor contract enforcement instrument in formal financial markets. The reasons are that these countries are characterized by corrupt legal systems, inadequate secondary markets for physical assets, and unmotivated loan officers who do not adequately enforce the collateral clause following default. Using an infinitely repeated game approach he demonstrates that as a result of this, financial contracts are maintained by reputation rather than the threat of recovering collateral. A borrower must build a good reputation with his bank over repeated interaction. He concludes that reputation is positively correlated with firm age and the threat of terminating future loans increases the likelihood that a borrower will pay back his loan in each period[13].

Isaksson (2002b) alludes to the importance of reputation effects as a contract enforcement mechanism in African financial markets. He explains that enforcement can be carried out in several ways. These include through legal action; terminating the relationship; and threatening to expose the borrower to other lenders, which would harm the reputation of the borrower.

3.2.2.2 Relationship Lending[14]

Petersen and Rajan (1994) and Berger and Udell (1995, 1998, 2002) suggest that because of high borrowing costs due to asymmetric information in credit markets, small firms benefit from relationship lending. Under this lending technology, the financial institution through contact over time collects information on the firm, the entrepreneur and the local community. Information can be obtained from a repayment history over several years, financial statements, as well as 'soft' data about the character and reliability of the entrepreneur. A key element of the relationship is its length in that its value increases with time.

Based on an infinitely repeated game analysis Boot and Thakor (1994) examine the impact of relationship lending on the collateral requirements of banks and the interest rate they charge on loans. Their model suggests that collateral requirements will be lower the longer the relationship between the borrower and the bank. It also predicts that a longer relationship will result in access to bank credit at lower interest rates. Thus, relationship lending produces valuable information

[13] The literature on African manufacturing uses firm age widely as a proxy for reputation (for example Isaksson, 2002a; Bigsten et al, 2003). Firm age is also used to measure reputation in studies from other regions (for example Berger and Udell, 1995).

[14] Much of the literature on relationship lending refers to SMEs. Evidence suggests that the majority of manufacturing firms in Tanzania and Uganda are SMEs implying that relationship lending is relevant to this study.

about the quality of the borrower. Similarly, Berger and Udell (1995) suggest that one of the benefits to a small firm from relationship lending is lower collateral requirements.

An opposing strand of the literature views relationship lending as detrimental to the financing conditions of firms. According to this line of thought, long term relationships give banks monopoly power over firms that lead to a positive correlation between the length of the relationship and the cost of debt. This is because banks have an incentive to undertake opportunistic behaviour in a contracting relationship with a firm (Fischer, 1990 in Harhoff and Korting, 1998). As an example they explain that after securing the debt contract with the firms at a low interest rate, banks may decide to raise interest rates in future periods. In a competitive banking environment it may be difficult to justify this argument given that firms can switch to other banks at a fairly low cost[15].

Greenbaum et al (1989) argue that banks can extract rents from firms because of the high costs firms would incur in conveying information about their quality to other banks. Banks will tend to set lower prices as a means of establishing a relationship that will lead to future monopoly profits. As a result, in the long run the interest rate and other non-price terms of debt are not reflective of the firms' low probability of default. Similarly, Sharpe (1990) explains that banks compete to fund profitable projects forwarded by entrepreneurs. Banks attempt to attract young firms with below cost interest rates with the expectation that these firms are 'locked-in' or 'captured' when they are old, allowing higher interest rates to be charged. Where firms can have multiple relationships with banks this 'lock-in' effect could have less impact on the cost of borrowing than what is argued by these authors.

3.2.3 Empirical Evidence on Collateral and Collateral Substitutes

Menkhoff et al (2004) examine the role of collateral in emerging markets compared to developed markets using Thailand as an example. Using a data set of 560 credit files of Thai commercial banks their evidence shows that both the prevalence and degree of collateralization are higher than what obtains in developed countries. They find that Thai banks use collateral mainly as a way of mitigating the higher credit risks of small and young firms.

[15] Opportunistic behaviour is likely to be present in SSA where the banking system is generally uncompetitive.

Collateral requirements placed on African manufacturing firms are generally very high. Based on a study of 6 countries, Bigsten et al (2003) report that the collateral required is more than twice the value of the loan. They also find that most loans in Africa are collateralized. In their empirical analysis the functioning of loan markets is modeled as a two-stage process. In the first stage the firm decides whether or not it has demand for bank credit. In the second stage they ask whether or not this demand is satisfied by the banking sector[16]. Their evidence suggests that collateral requirements placed on large firms exceed those placed on micro and medium firms. However, small firms on average face higher collateral-to-loan ratios compared to large firms.

Several empirical studies show that firm size is an important determinant of access to bank credit in African manufacturing[17]. Based on firm level data for Kenya, Biggs et al (1996) find that small firms have limited access to finance relative to large firms. They suggest that firm age, whether the firm keeps accounts, and characteristics of the owner could be used as collateral substitutes. Their results show that younger firms that do not keep records are more likely to be credit constrained. Fafchamps et al (1995) and Cuevas et al (1993) examine the nature of enterprise finance in Zimbabwe and Ghana respectively. These studies also show that firm size is an important determinant of access to bank finance.

Bigsten et al (2003) cite as their most significant finding the strong bias in credit allocation faced by small firms. This bias is present even after controlling for factors meant to explain why small firms are unable to obtain credit, such as whether the firms kept accounts and location. They also find that younger firms are more likely to be credit constrained. Firms with one owner and those that do not keep records face a higher probability of being credit constrained.

Isaksson (2002a) uses firm level panel data for the period 1993-95 to determine the factors affecting banks' decisions to extend loans to Kenyan manufacturing enterprises. He finds that an increase in the share of tangible assets in total assets significantly increases the probability that firms will obtain a long-term loan, and that banks generally prefer to lend to large firms[18]. He argues that this may indicate that the legal contract enforcement mechanism is effective in Kenya. In addition, Isaksson finds that Asian owned firms in Kenya pledge the highest amount

[16] In section 3.4.3.1 a similar approach is used to test the robustness of our results.
[17] Firm size is conventionally measured by employment in firm level studies on SSA.
[18] This is the only study we have identified that directly examines the effect of collateralizable assets on access to bank credit by African manufacturing firms.

of collateral and pay the highest interest rates and suggests that this may be a result of ability to pay relative to African owned firms.

Based on a baseline survey of the Micro and Small Enterprise (MSE) sector in Kenya, Kimuyu and Omiti (2000) find that relatively more educated entrepreneurs operating older, larger, formally registered enterprises borrow more from commercial banks. Entrepreneurs with education higher than secondary level borrow more than those with lower levels of education. They also find that older entrepreneurs have higher demand for credit citing that this reflects their experience in business, which is closely correlated with age.

Green et al (2002) investigate the factors affecting the debt-equity decisions and success of loan applications for MSEs in Kenya. They find that age has a negative effect on the probability of incurring debt. They interpret this as evidence that older firms are more likely to raise their initial capital as equity, and that borrowing has become more feasible for younger firms. In addition, more educated individuals have a higher likelihood of borrowing. Their findings also show that asset tangibility measured by owning land and being housed in permanent structure has a positive impact on the likelihood that firms will obtain bank credit.

3.2.3.1 Relationship Lending

Based on data from the National Survey of Small Business Finance, Petersen and Rajan (1994) find that small firms in the United States who enjoy close relationships with their banks have greater access to credit relative to other small firms. A small downward effect on loan interest rates is observed. They measure the firm-bank relationship by the length of the relationship and the number of banks a firm borrows from, where a longer relationship and fewer banks are interpreted as a stronger relationship. Firm age is also used to proxy for relationship strength, and is negatively related to interest rates. Using the same database as Petersen and Rajan (1994), Berger and Udell (1995) find that stronger relationships measured by length and number of lenders, lead to lower interest rates and less collateral requirements for small firms. They point out that age reflects reputation because it captures information that becomes known by the market as a whole, and not just the firms' lenders.

Harhoff and Korting (1998) examine the role of relationship lending in explaining the collateral requirements and the cost of credit faced by German SMEs. Their findings suggest that longer

more concentrated relationships are beneficial for firms. Relationship lending leads to greater credit availability and lower collateral requirements, and to a less extent, lower loan interest rates. In the case of Spanish SMEs, Canovas and Solano (2003) find that firms with more concentrated financial relationships (i.e. fewer banks per firm) access debt at a lower cost. Jimenez and Saurina (2003) find that Spanish banks are generally willing to take on more risk the closer the bank-borrower relationship while Jimenez et al (2006) find that relationship lending decreases the likelihood that collateral will be required, particularly for long-term loans.

In the case of Belgium, Degryse and Van Cayseele (1998) find that relationship lending has two opposing effects on loan interest rates. Utilising data obtained from a major Belgian bank their results show that the length of the bank-firm relationship leads to higher loan interest rates. However, widening the relationship by purchasing other products from the bank is associated with lower interest rates. Therefore, the price effect is more a function of the scope of the relationship than its length. They also find that the length of the relationship has a small negative effect on the likelihood of pledging collateral.

Several studies have found that the informational monopoly enjoyed by Japanese main banks leads them to extracts rents in the form of higher interest rates. Consequently firms with main banks in Japan tend to have lower profits (Nakatani, 1984; Weinstein and Yafeh, 1995 and 1998). Morck et al (2000) find that equity ownership by a main bank is negatively related with firm value for listed Japanese firms. Nam (2004) concludes that although relationship banking in Japan can lead to greater access to credit, it is associated with the extraction of monopoly rents and high levels of corporate inefficiency.

Menkhoff et al (2004) find that in Thailand longer credit relationships are not associated with lower collateral requirements. They argue that these relationships have no impact in terms of reducing information asymmetry between banks and their clients. Rather, their evidence suggests that longer relationships lead to lock-in effects as banks demand higher collateral. This is a surprising finding because a longer relationship is meant to reduce the information asymmetry problem that collateral is expected to address.

Based on firm level data Habyarimana (2003) estimates the effect of losing a banking relationship on firm performance in Uganda during the banking crisis of 1998-1999. He finds that firms that lost a banking relationship declined by 10-15 percent relative to unaffected firms

over the three years following the crisis. Affected firms find it difficult to borrow from uninformed lenders. Furthermore, older firms that lost a banking relationship faced larger growth declines compared to younger unaffected firms. His evidence supports the view that the banking relationship reflects valuable information to the lender.

3.3 Summary of Literature Review

Collateral plays two main roles: (1) it acts as a disincentive for default by the borrower and (2) it alleviates information asymmetry problems. Reputation and relationship lending are identified as two important collateral substitutes having a positive impact on access to bank finance. This stems from the ability of these substitutes to alleviate the information asymmetry that exists between firms and banks. Other factors that affect the likelihood that a firm will secure bank finance include the level of education and keeping of financial records.

Important gaps exist in the literature. There is limited empirical evidence on how collateral affects access to external finance by firms in SSA. Only one study (Isaksson, 2002a) has been identified that directly investigates the impact of collateralizable assets on access to bank finance by manufacturing firms in Kenya. There is also limited knowledge about how collateral substitutes affect access to bank finance in the EAC. In particular, the role of relationship lending is largely unknown.

3.4 Empirical Analysis

In this section the effect of collateral and collateral substitutes on access to bank finance in the EAC is empirically investigated. This is done do bearing in mind that the role of collateral is to a large extent dependant on the quality of the legal system.

3.4.1 Descriptive Statistics on Collateral and Collateral Substitutes

To begin, an examination of how the availability of collateral and collateral substitutes differs across the three countries is done. The study argues that collateral is an important determinant of access to bank finance. It is useful to investigate the extent to which firms' ability to raise collateral differs before testing the importance of collateral in obtaining bank finance. The literature review showed that manufacturing firms in Africa use collateral substitutes to improve

their chances of obtaining bank credit. Three collateral substitutes mentioned in the literature are financial accounts, ethnicity and a relationship with a financial institution.

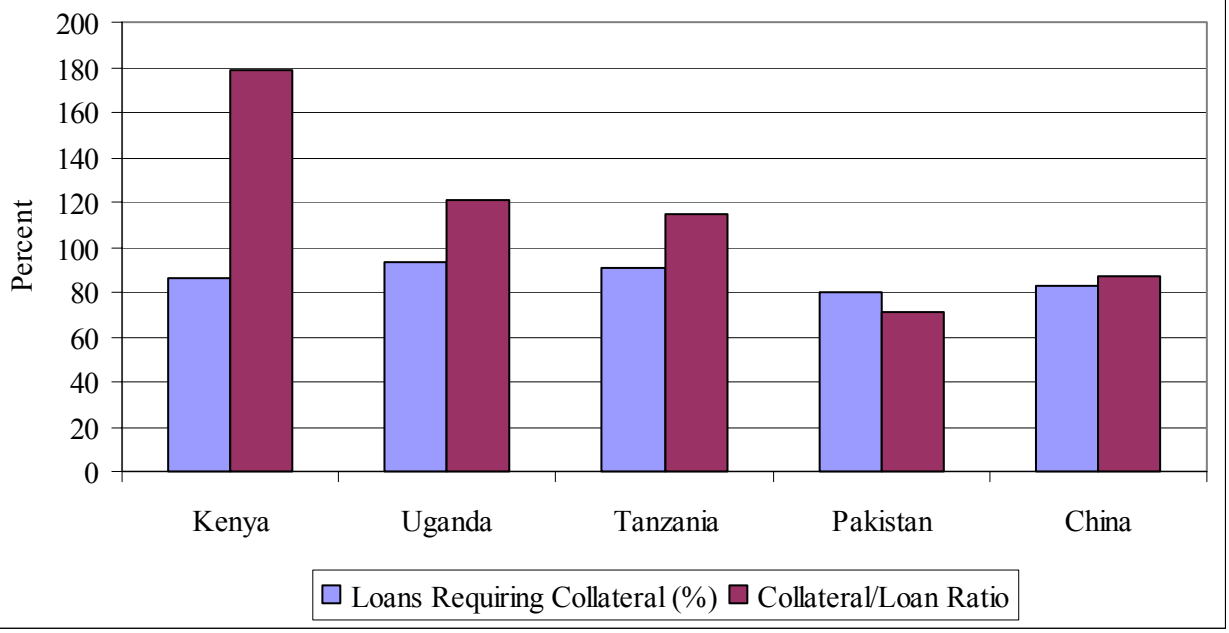
Collateral

Figure 3.1 shows that the majority of loans in all 3 countries require collateral. This suggests that collateral does play some role in these countries. Furthermore, collateral as a share of the loan value is significantly higher in Kenya than in Uganda and Tanzania[19]. The corresponding figures for Pakistan and China are 70.9 percent and 86.8 percent respectively. This is significantly lower than what one observes in the EAC. Although Kenya has the highest collateral requirements, a slightly lower share of Kenyan loans is backed by collateral compared to Ugandan and Tanzanian loans.

The extremely high collateral requirements in the EAC are a cause for concern. Apart from high enforcement costs other factors are likely to be present. Some of these factors were mentioned in chapter 2. First, the indivisibility of collateral increases the likelihood of high collateral-to-loan ratios for small loans (Isaksson, 2002a) Second, the absence of secondary markets for capital goods makes it difficult to correctly value assets pledged as collateral. Third, firms may overstate the value of their collateral as a way of improving their chances of obtaining loans. This is plausible in an environment where underdeveloped secondary markets may accurate valuation difficult. Fourth, collateral requirements may reflect central bank requirements based on the risk profile of the lending banks (Nkurunziza, 2005b).

[19] Chapter 2 showed that this is a result of the higher enforcement costs obtaining in Kenya.

Figure 3.1: Collateral Requirements in the EAC, Pakistan and China



Source: World Bank (2002/03), Investment Climate Surveys
Kenya (n=78) Uganda (n=50) Tanzania (n=45)

Table 3.1 shows the replacement values of firms' business premises and leasehold. It gives an indication of the value of real estate owned by firms. Kenyan firms appear to have more collateralizable real estate than Ugandan and Tanzanian firms.

Table 3.1: Replacement Value of Business Premises (US$)

	Kenya	**Uganda**	**Tanzania**
Mean	12,983,210,926.30	661,993.80	2,472,635.50
Standard Deviation	190,929 ,572, 445	2,080, 551.8	9,900,887.7

Source: World Bank (2002/03), Investment Climate Surveys
Kenya (n=215) Uganda (n=174) Tanzania (n=234)

The means test described below is used to test whether the mean value of real estate for Kenya is significantly different to that of Uganda and Tanzania. A description of this test can be found in standard statistics texts such as (Johnson and Bhattacharyya, 1986). The test is based on the following assumptions:

- X_1, X_2, X_{n1} is a random sample of size n1 from population 1 whose mean is denoted by μ_1 and whose standard deviation is denoted by σ_1.

- Y_1, Y_2, Y_{n2} is a random sample of size n2 from population 2 whose mean is denoted by μ_2 and whose standard deviation is denoted by σ_2.

- The samples are independent.

To test for the equality of means the following test statistic is used:

$$Z = \frac{\overline{X} - \overline{Y}}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

where:

$\overline{X}$ is the mean of the sample drawn from population 1 and $\overline{Y}$ is the mean of the sample drawn from population 2.

s_1 is the standard deviation of the sample drawn from population 1 and s_2 is the standard deviation of the sample drawn from population 2.

The Z statistics are equal to 0.99 when comparing Kenya with both Uganda and Tanzania. This means that there is no significant difference in the value of real estate between Kenya and the other countries.

Similarly, from Table 3.2 one observes that the mean replacement values for firms' machinery and equipment are higher in Kenya compared to Uganda and Tanzania. The means test is performed again yielding similar results to what was found in the case of real estate. The Z statistics are equal to 1.02 against Uganda and 1.01 against Tanzania. The analysis suggests that there is no significant difference in collateral ownership across manufacturing firms in East Africa[20]. This means that the greater access to bank finance enjoyed by Kenyan firms observed in chapter 2 cannot be attributed to these firms having more collateral. Rather, it will be explained by the relative effectiveness of collateral as an enforcement mechanism and by the relevance of collateral substitutes.

[20] This is a result of the large variation in collateral value in Kenya as shown by the standard deviations in Tables 3.1 and 3.2.

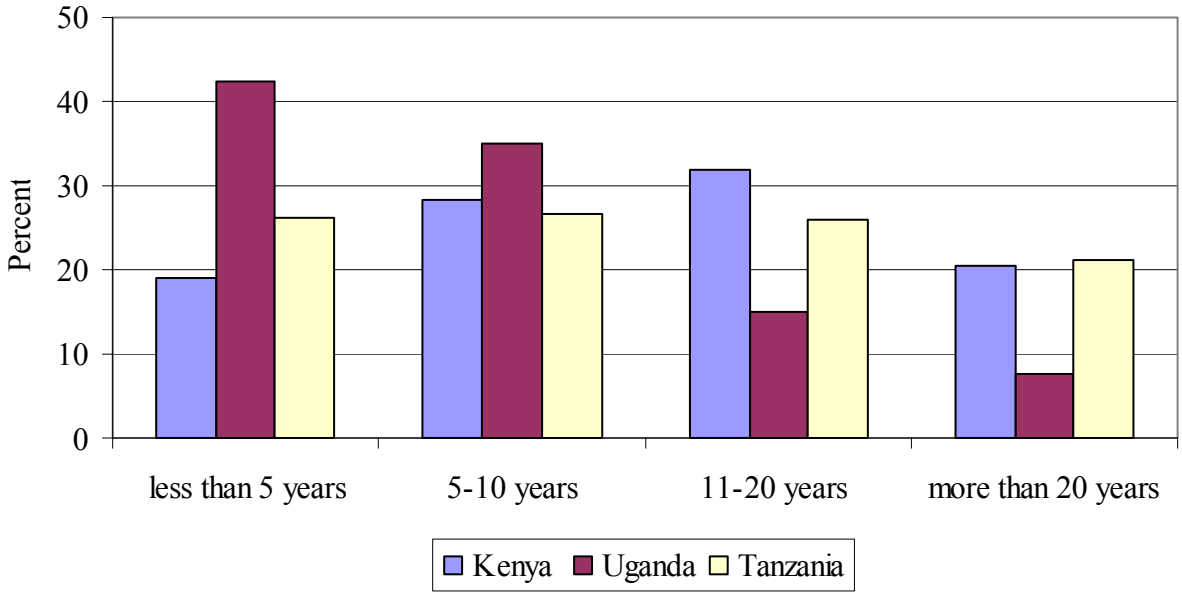
Table 3.2: Replacement Value of Machinery and Equipment (US$)

	Kenya	Uganda	Tanzania
Mean	301,668, 724.5	1,713,396.6	3,900,349.7
Standard Deviation	4,455,023,357.1	9,457,053.8	18,001,613.9

Source: World Bank (2002/03), Investment Climate Surveys
Kenya (n=229) Uganda (n=274) Tanzania (n=247)

It is clear from Figure 3.2 that Ugandan manufacturing firms have the youngest machinery and equipment in the EAC. This is largely because capital accumulation in Uganda only resumed when economic reforms were instituted in the late 1980s and early 1990s, following decades of political unrest.

Figure 3.2: Age of Machinery and Equipment



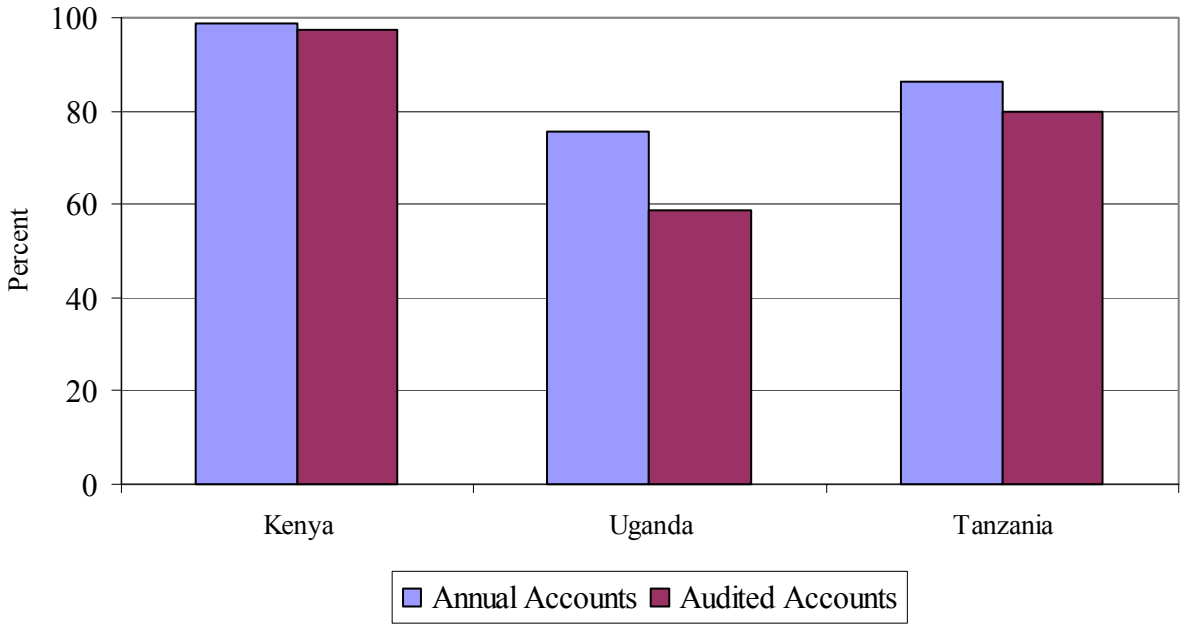
Source: World Bank (2002/03), Investment Climate Surveys
Kenya (n=238) Uganda (n=293) Tanzania (n=266)

Over 40 percent of the machinery and equipment in Uganda is less than 5 years old, while the corresponding shares for Kenya and Tanzania are 19 percent and 26 percent respectively. Figure 3.2 shows that Kenyan firms have the oldest machinery and equipment. This is again consistent with the observation that Kenyan firms are on average far older than Ugandan and Tanzanian firms.

According to Figure 3.3 almost all firms in Kenya keep annual accounts and have these accounts audited by an outside agency. Uganda has the lowest level of financial information available in

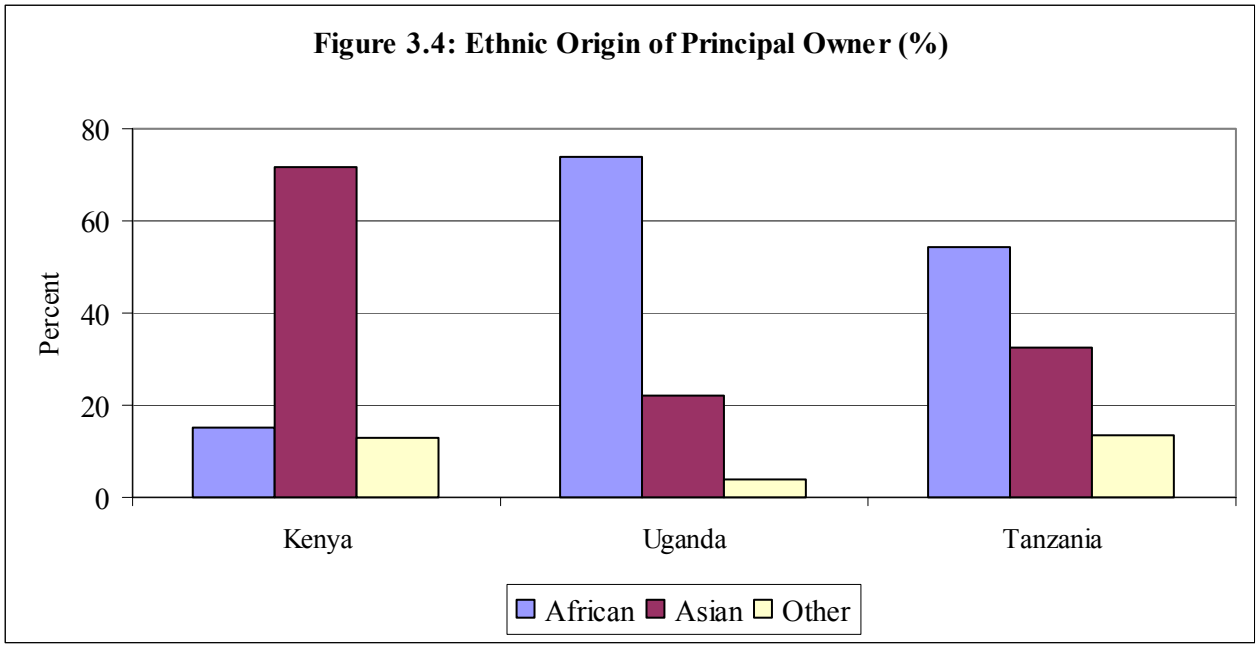
terms of both the keeping of annual accounts and having the accounts audited. The implication of this observation is that information asymmetry between lenders and firms in Kenya, is less compared to Uganda and Tanzania.

Figure 3.3: Share of Firms with Financial Accounts (%)



Source: World Bank (2002/03), Investment Climate Surveys
Kenya (n=253) Uganda (n=296) Tanzania (n=271)

Figure 3.4 shows that Kenya has the smallest share of principal owners who are African. Kenya also has by far the largest share of principal owners who are of Asian origin. In Uganda and Tanzania Africans comprise the greatest share of principal owners. This ethnic composition may be important if it is associated with linkages to the financial sector, better quality business management skills, or access to assets that can be pledged as collateral.



Source: World Bank (2002/03), Investment Climate Surveys
Kenya (n=206) Uganda (n=242) Tanzania (n=225)

Table 3.3 shows that the average length of bank relationships in Kenya is longer than in Uganda and Tanzania. This is consistent with the fact that Kenyan firms are older than their counterparts. On average Ugandan firms have the shortest relationships with banks.

Table 3.3: Length of Bank Relationship (years)

	Kenya	**Uganda**	**Tanzania**
Mean	15.0	7.3	10.0
Standard Deviation	13.4	6.3	9.6

Source: World Bank (2002/03), Investment Climate Surveys
Kenya (n=222) Uganda (n=272) Tanzania (n=237)

3.4.2 Testing of Hypotheses

The hypotheses to be tested are presented below. The variables used in the estimation and their main limitations are also discussed.

Hypothesis 1: *Firms with more collateral have better access to bank loans.*
Hypothesis 2: *Firms with effective collateral substitutes have better access to bank loans.*

Hypothesis 1 allows us to indirectly test two issues. First, the role played by collateral gives an indication as to how effective the legal system is in providing protection to creditors and enforcing debt contracts. If collateral is important for access to bank finance one can infer that the legal systems are important for the functioning of formal credit markets. Second, one can

infer whether or not secondary markets effectively facilitate the sale of collateral to recover overdue debt. If the thinness of secondary markets for real estate and equipment and machinery in SSA prohibits the meaningful valuation and sale of these assets, then one would expect collateral not to be important for access to bank finance. This means that the observed impact of collateral will give an indication of how relevant secondary markets are for valuing and facilitating the sale of real assets.

3.4.2.1 Variables and Estimation Procedures

The data used in the estimation procedure are taken from the ICA surveys completed in the ECA countries between 2002 and 2003. As explained in chapter 1, the data are mainly cross-sectional.

The dependent variable is the probability that the firm had a loan at the time of the survey in 2002/2003. The majority of firms in the study obtained their latest loans between 2000 and 2003. This is shown by Table 3.4. In Tanzania loans held by firms in 2003 were obtained in that year or in previous years. Table 3.4 shows that in the case of Kenya and Uganda all loans held in 2003 were obtained prior to that year.

Table 3.4: Percentage of Firms Receiving Latest Loan in Specific Year

	Kenya	**Uganda**	**Tanzania**
Before 1993	2.97	0	1.89
1993 -1999	21.78	20.32	9.44
2000	10.89	11.86	7.55
2001	15.84	13.56	13.21
2002	48.51	54.24	52.83
2003	-	-	15.09

Source: World Bank (2002/03), Investment Climate Surveys
Kenya (n=93) Uganda (n=60) Tanzania (n=53)

The dependent variable takes a value of 1 if the firm has a bank loan and 0 otherwise. Given that the dependent variable is binary the author estimates a probit model by maximum likelihood[21]. Thus we have equation (1) below:

Loan = 1 (1)
No Loan = 0

[21] Our estimation is done using Stata/SE 8.2.

Table 3.5 shows the share of firms reporting they have loans in each country. A higher share of Kenyan firms has loans relative to Ugandan and Tanzanian firms. Table 3.5 also shows that access to bank loans is similar between Uganda and Tanzania.

Table 3.5: Share of Firms with a Bank Loan (%)

Kenya	39.0
Uganda	20.0
Tanzania	19.2

Source: World Bank (2002/03), Investment Climate Surveys
Kenya (n=93) Uganda (n=60) Tanzania (n=53)

One may ask why the question of access to bank finance is being investigated in a binary framework rather than using the actual amount loaned to the firm. The amount of loan obtained also provides a measure of access to finance. As discussed by Nkurunziza (2005a), there are 3 important reasons why the amount of loan is not used. First, given the occurrence of credit rationing, if a firm is able to secure bank finance it overcomes an important entry barrier. In overcoming this hurdle, securing a loan is more important than the value of the loan. Over time, reputation effects become useful in negotiating the amount of the loan. Second, the amount of loan is a variable that suffers from a high level of measurement error. Firms are known to manipulate their balance sheets for reasons including tax evasion. The amount of outstanding credit is one of the variables they use for this purpose. The third reason is that many firms do not respond to this question meaning few observations for empirical analysis and a high possibility of selection bias.

Explanatory Variables

Collateral: The study has 2 measures of collateral. The first measure of collateral is the replacement value of machinery and equipment owned by the firm. The second measure is the replacement value of business premises owned by the firm. For both measures the value is for 2002 in the case of Tanzania and Uganda, and for 2001 in the case of Kenya.

Reputation and relationship lending: these are the main collateral substitutes in the model. An increase in the value of these variables is expected to reduce collateral requirements and improve the likelihood that a firm will secure a loan or overdraft. Reputation is measured by the age of the firm. Z statistics of 9.6 and 6.3 are found when comparing firm age in Kenya against firm age in Uganda and Tanzania respectively. This shows that Kenyan firms are significantly older than

Ugandan and Tanzanian firms as suggested by Table 1.7. Relationship lending is measured by the number of years that a firm has had an account with its main bank. Banks can observe cash flows through these accounts, giving an indication of the viability and spending behaviour of firms. Z statistics of 7.88 and 4.48 are found when comparing length of bank-firm relationship in Kenya against length of bank-firm relationship in Uganda and Tanzania respectively. Thus, bank-firm relationships are significantly longer in Kenya.

Firm size: is measured by the number of employees. This is standard practice in firm level studies on SSA. Size is expected to have a positive effect on access on bank finance. Z statistics of 2.35 and 3.25 are found when comparing firm size in Kenya against firm size in Uganda and Tanzania respectively. This confirms what was said in earlier chapters about Kenyan firms been substantially larger than firms in the other countries. Larger firms are perceived as safer borrowers than small firms and command greater influence in the market. Isaksson (2002b) states that firm size can also proxy for reputation because large firms have more at stake in the event that contractual agreements are breached compared to smaller firms.

Financial Records: Keeping good quality financial records reduces the asymmetry of information between a firm and the bank. The impact of financial records is measured by whether or not a firm has its records audited by an outside agency. This indicator captures the role that financial information plays in allowing a bank to monitor a firm and assess its risk. Firms that have their records audited are more likely to secure bank finance.

Type of Bank: Whether the bank is a local bank or a foreign bank can also affect access to bank finance. Foreign banks may be better capitalized than domestic banks. Alternatively, domestic banks may have a more borrower-friendly policy than their foreign counterparts. This variable takes a value of 1 if the firm's main bank is a local bank and 0 if it is not.

Ownership Structure: Whether the firm is locally-owned or foreign-owned can have a bearing on how easily firms can access bank finance. If foreign owned firms have stronger links to the financial institution (this may be the case if the main banks are foreign owned) then they may be able to secure bank finance more easily. There could also be differences in management capability, market power, and profitability between domestic and foreign firms. The variable takes a value of 1 if the firm is locally-owned and 0 otherwise.

Ethnicity: refers to whether the firm owner is African or not. Ethnicity can affect the likelihood that an entrepreneur obtains a bank loan or overdraft. Bigsten et al (2003) find evidence suggesting that African entrepreneurs have the weakest links with the financial sector.

Education: This variable refers to whether or not the firm's top manager has had post-secondary school education. Better educated managers are likely to have a more comprehensive understanding of how the banking system works and the benefits of external finance. They are also in a stronger position to present good cases for bank finance using business plans and by keeping financial records. Educational attainment is expected to have a positive impact on access to bank finance.

Industry Differences: It is possible that market power, growth opportunities and profitability may vary across industries. These unobservable differences can affect a firm's access to bank finance. Industry dummies are included to account for this.

3.4.3 Presentation and Discussion of Estimation Results

Based on the discussion in section 3.5.2, the author estimates the following equation giving the probability of a firm having a bank loan as a function of several variables:

$$Pr(Loan) = F(RVA, A, L, E, AA, LB, LO, AFR, EDU, I) \quad (2)$$

Where RVA, A, L, E, AA, LB, LO, AFR, EDU, I are the replacement value of assets owned by the firm (real estate and machinery and equipment), firm age, length of bank-firm relationship, employment, audited accounts, local bank, local ownership, African entrepreneur, education level, and industry dummies respectively. Table 3.6 shows the correlation between the two measures of collateral[22]. For all 3 countries the correlation is high. This is to be expected because firms with larger business premises are likely to be the firms with more machinery and equipment. This means that collinearity may be a problem in the model.

[22] Correlation matrices of variables used in chapters 3, 4 and 5 are presented in the appendices.

Table 3.6: Correlation between Measures of Collateral

	Kenya	Uganda	Tanzania
Correlation	0.64	0.76	0.72

Source: Authors computations

Given the problem of collinearity, separate equations are estimated for each measure of collateral. Using real estate yields very poor results. In the case of Uganda and Tanzania an insignificant positive effect is obtained. For Kenya the estimation gives a surprising significant negative effect. Real estate does not perform well as collateral in the EAC. This suggests that the legal framework around real estate is poor. This is supportive of Nkurunziza (2005b) who argues that collateral is an ineffective contract enforcement mechanism in SSA.

Machinery and equipment performs better as collateral in the EAC. The results in Table 3.7 show that the effect of the replacement value of machinery and equipment on access to bank loans is positive and significant at the 1 percent level in Uganda, and the 5 percent level in Tanzania. Collateral in these countries plays a role in the transmission mechanism. However, the value of machinery and equipment is not a significant determinant of access to bank loans in Kenya. This is in contrast with Isaksson (2002a) who found a significant effect on access to bank finance in Kenya[23]. The finding here that collateral in the form of machinery and equipment is not important for access to bank credit in Kenya is reflective of the weakness in the legal system with respect to contract enforcement observed in chapter 2. On the other hand, the value of machinery and equipment positively affects loan access in Tanzania and Uganda which have more efficient contract enforcement relative to Kenya.

The insignificant effect of collateral on access to bank finance can not be attributed to Kenyan firms as a whole having substantially greater collateralizable wealth. If Kenyan firms had significantly more collateral then differences in the value of machinery and equipment would be irrelevant in the banks' decisions to extend loans. Notably, the means test showed no evidence that Kenyan firms have more collateral than firms in the other countries.

It appears that the *type* of collateral is important. The results suggest that the legal framework is better suited to facilitate the transfer of machinery and equipment from defaulting borrowers to banks, compared to real estate. It also suggests that the secondary markets for machinery and

[23] However Isaksson (2002) used the ratio of fixed assets to total assets as a measure of tangibility. As discussed earlier we do not have data to calculate this measure.

equipment are fairly active with respect to machinery and equipment. Even if the private real estate markets in these countries are active, it appears that there is need to improve the functioning of the business real estate markets.

Table 3.7: Effect of Machinery and Equipment on Loan Access in the EAC

	Kenya	Uganda	Tanzania
Log of Replacement Value of Machinery&Equip.	-0.062	0.258***	0.175**
	(-0.72)	(3.12)	(2.05)
Log of Firm Age	-0.115	0.253	-0.329*
	(-0.70)	(1.57)	(-1.64)
Log of Length of Relationship	0.068	-0.275	-0.240
	(0.45)	(-1.56)	(-1.20)
Log of Employment	0.305**	0.207	0.180
	(2.42)	(1.37)	(1.54)
Audited Accounts	-0.087	-0.011	0.041
	(-0.15)	(-0.03)	(0.07)
Local Bank	-0.022	0.783***	-0.021
	(-0.09)	(3.08)	(-0.07)
Local Ownership	-0.113	-0.579*	0.483
	(-0.39)	(-1.77)	(0.87)
African Owner	0.237	0.313	-0.137
	(0.74)	(1.08)	(-0.45)
Education Level of Manager	0.224	0.039	0.248
	(0.98)	(0.14)	(0.76)
Agro	-0.333	-0.433	0.438
	(-1.01)	(-0.87)	(0.87)
Metal	0.263	-0.718	0.280
	(0.73)	(-1.08)	(0.46)
Furniture and Wood	0.068	0.056	0.422
	(0.16)	(0.10)	(0.54)
Chemicals	0.039	-1.511**	0.603
	(0.07)	(-2.09)	(0.99)
Construction Materials	-0.273	-1.506**	0.594
	(-0.52)	(-2.34)	(0.77)
Plastics	0.299	-0.111	0.368
	(0.73)	(-0.16)	(0.47)
Paper, Printing & Publishing	0.573	-0.623	0.440
	(1.32)	(-1.08)	(0.76)
Constant	-0.224	-6.198***	-4.43***
	(-0.17)	(-4.24)	(-2.44)
Number of Observations	149	205	143
Log-Likelihood	-93.65	-74.05	-51.66
Wald – χ^2	15.89	49.43***	33.37***
Pseudo R^2	0.08	0.29	0.25

Dependent variable: Probability that the firm had a loan at the time of the survey in 2002/2003.
*, **, and *** indicate significance at 10 percent, 5 percent, and 1 percent respectively. Numbers in parentheses are z statistics. The reference industry is textiles.

The literature review showed that collateral has an important role to play in alleviating the negative effects of information asymmetry, namely moral hazard and adverse selection. Thus, it will be more important in the countries where information asymmetry is more acute. It has been seen that information asymmetry is much more serious in Uganda and Tanzania. This is consistent with the

result that collateral significantly increases the likelihood of having bank loans in these countries, while it does not appear to affect access to loans in Kenya.

It was earlier noted that contract enforcement in Uganda and Tanzania is substantially less costly than it is in Kenya. The finding that machinery and equipment has a significant effect on access to bank loans in Uganda and Tanzania is supportive of the argument that collateral is effective where legal contract enforcement is more efficient. Thus, in an environment where legal rights are relatively weak (Uganda and Tanzania) collateral can still have an important role to play provided enforcement costs are kept low.

Based on the results, secondary markets for machinery and equipment in the EAC appear to perform an important function in facilitating the use of collateral as an enforcement mechanism for loan contracts. Interestingly, even though Kenya is a larger economy with a more developed financial sector, secondary markets appear more relevant in Uganda and Tanzania. While it is acknowledged that the costs associated with these markets are likely to be high, they still function well enough to ensure that collateral pledged by firms improves their chances of securing bank loans.

Firm size appears to be an important factor determining loan access in Kenya. This is consistent with the arguments forwarded in chapters 1 and 2 about the important role played by non-legal factors as determinants of external finance in Kenya. This shows that reputation effects are important when different types of collateral are ineffective. Reputation effects are only important in Kenya where both real estate *and* machinery and equipment are ineffective as collateral. Small Kenyan firms are still at a disadvantage in the formal loan market despite financial reforms which were in part meant to improve access to credit by these firms. The results for Kenya show that when collateral is not effective as an enforcement mechanism reputation can play a significant role. In chapter 2 it was argued that where better information availability exists (Kenya), firms will work harder to protect their reputations because they can be easily sanctioned using mechanisms that do not rely on collateral.

Notably, with the exception of reputation (firm size), none of the collateral substitutes have a meaningful effect on improving access to bank finance in any of the countries. Firm age has an insignificant negative and positive effect for Kenya and Uganda respectively. A significant negative effect obtains in Tanzania. Isaksson (2002a) also found that older firms in Kenya are less likely to

have access to bank loans. He states that it brings into question the usefulness of this variable as a proxy for repeated interaction. In the author's view it may be that older firms are able to rely more on internal sources of finance. It may also be that banks are relatively more accommodative of younger firms, and that younger firms present more profitable opportunities for banks.

The length of the bank-firm relationship has a negative impact on loan access in Uganda and Tanzania, and a positive effect in Kenya. For all countries the impact of this variable is insignificant. Similar to Menkhoff et al (2004), one could argue that having a longer bank-firm relationship does not appear to address the problem of information asymmetry in the context of non-developed countries. However, it is possible that the measure of relationship banking is inadequate. Using the length of firm's credit history would be more appropriate than the period it has held an account with a bank. Unfortunately this study does not have access to such data. Interestingly, having audited financial records has an insignificant effect on access to bank loans in all countries. In the case of Kenya this is because nearly all firms have their accounts audited. However, for Uganda and Tanzania it suggests that the quality of these audited financial statements may not be of good enough quality to meaningfully affect the lending decisions of banks.

In Kenya and Tanzania access to loans is not significantly affected by whether the bank making the lending decision is local or foreign. This is in sharp contrast with Uganda for which the coefficient on local banks is positive and highly significant. Local Ugandan banks appear to be less conservative than foreign banks. Whether the major owners of the firm are based locally does not have an important effect on access to bank loans in Kenya and Tanzania, while a significant negative effect is observed in Uganda. This suggests that local Ugandan banks are not necessarily lending more to domestic firms. African owners in Kenya and Uganda are more likely to have bank finance while they are less likely to obtain it in Tanzania. For all countries ethnic origin is an insignificant determinant of access to bank loans. The educational level of the firm's top manager has a positive insignificant effect on access to bank finance in all countries. There is no evidence to suggest that being in a particular industry has a meaningful effect on access to bank loans in all 3 countries.

Probit coefficients can not be interpreted in the same way as coefficients in standard linear regression models. They do not equal the marginal impact of the explanatory variables. To gain further insight into the model the marginal probability elasticity technique is used. This gives the marginal impact on the explanatory variable of a unit change in one variable while holding the others constant at some value. In the case of discrete variables one can obtain marginal effects

calculated as the finite changes in these variables as their values change from 0 to 1. The results are presented in Table 3.8 below.

In examining the marginal probability elasticities and marginal effects it is instructive to focus on variables that were found to be significant in the probit analysis presented in Table 3.7. These are marked with an asterisk in Table 3.8. The most striking results are for Uganda. Being a local bank in Uganda increases the likelihood of firms having loans by 0.18 percent. In contrast the probability of having a loan declines by 0.14 percent as a result of being a locally owned firm. Furthermore, being in the chemicals and construction industries reduces the probability of having a loan by 0.14 percent and 0.15 percent respectively. Firm size in Kenya also has a notable effect. A 1 percent increase in size leads to a 0.12 percent increase in the probability of having a bank loan. Interestingly, the marginal effects of machinery and equipment in Uganda and Tanzania are relatively small. The results show that a 1 percent increase in the value of collateral increases the probability of having a bank loan by 0.05 percent and 0.03 percent in Uganda and Tanzania respectively. In Tanzania a 1 percent increase in age reduces the probability of having a loan by 0.06 percent.

Table 3.8: Marginal Probability Elasticities and Marginal Effects

	Kenya	Uganda	Tanzania
Marginal Probability Elasticity			
Log of Replacement Value of Machinery&Equip.	-0.024	0.053*	0.033*
Log of Firm Age	-0.045	0.052	-0.063*
Log of Length of Relationship	0.026	-0.056	-0.046
Log of Employment	0.119*	0.042	0.034
Marginal Effect			
Audited Accounts	-0.034	-0.002	0.008
Local Bank	-0.008	0.182*	-0.004
Local Ownership	-0.044	-0.143*	0.115
African Owner	0.094	0.059	-0.026
Education Level of Manager	0.087	0.008	0.047
Agro	-0.126	-0.086	0.094
Metal	0.104	-0.101	0.060
Furniture and Wood	0.026	0.012	0.093
Chemicals	0.015	-0.140*	0.148
Construction Materials	-0.103	-0.153*	0.151
Plastics	0.118	-0.021	0.085
Paper, Printing & Publishing	0.226	-0.093	0.101

Marginal probability elasticity is the derivative of the dependent variable with respect to a continuous explanatory variable while holding the other variables constant. Marginal effect is the change in the dependent variable associated with a discrete change in a dummy variable from 0 to 1.

3.4.3.1 Robustness Checks

In this section a number of tests to check the robustness of the results are conducted. The focus is on the model reported in Table 3.8 in which machinery and equipment is found to be an important form of collateral for Uganda and Tanzania.

Model Specification

An important limitation of probit estimation by maximum likelihood is that it requires a complete specification of the distribution of the observed random variable (Greene, 2003). In the event that the correct distribution differs from what is assumed, the likelihood function will be misspecified, and the estimator will be misleading. With cross-sectional data, problems such as heteroscedasticity can arise. To account for this the results are based on an estimator due to Huber (1967) and White (1980, 1982) that is robust to several forms of misspecification error. The literature commonly refers to this as the Huber-White 'sandwich' estimator[24].

Some explanatory variables are dropped in the specifications estimated in this section. This is because of the problem of model underidentification, which occurs when one or more of the independent variables perfectly predict a particular outcome. For example, it could be that one of the industry dummies always takes a value of 1 when the dependant variable equals 0. In this case a model with finite coefficients cannot be fitted. The problem is solved in a step-by-step process. First, the variable causing the problem is removed. Second, the observations that led to the problem are taken out of the estimation. Finally the modified model using the remaining observations is fitted. This process is undertaken automatically by Stata/SE 8.2.

Endogeneity

Endogeneity arises because there are some loans dating back to the 1990s. This means that some of the collateral being used to explain loan access may not have been there prior to when firms obtained these loans. Rather, the early loans were used to obtain these assets. Based on the age structure of machinery and equipment (see Figure 3.2), it is not expected that endogeneity will be a serious problem (with the exception of Uganda). For all countries over 75 percent of loans

[24] The Huber-White estimator is used throughout this study.

were obtained between 2000 and 2003. Much of the machinery and equipment used to measure collateral was already in place at this time.

However, the possibility of reverse causality implies that the results could be biased. One way of addressing this is to consider only those loans that were obtained after the firm's assets were already in place. This is done by examining the effect of collateral on the probability that firms obtained loans in 2002 and 2003. Recall that for Tanzania and Uganda the replacement value figures are for 2002 and for Kenya these figures are for 2001. Thus, for Tanzania and Uganda new investment undertaken in 2002 is subtracted from the replacement value figures. The results are presented in Table 3.9. The model identification problem explained above leads to the dropping of some explanatory variables.

The results in Table 3.9 are largely consistent with those in Table 3.7 with regard to the effect of collateral on access to bank loans. Kenyan firms with collateral were not likely to have obtained loans in 2002 and 2003. Having taken account of possible endogeneity, the results maintain that collateral has a significant positive effect on access to bank loans in Uganda and Tanzania, although this effect is weaker for Tanzania relative to what is observed in Table 3.7. Firm size remains the most important determinant of access to bank finance in Kenya. The results also show that local banks in Uganda are responsible for extending these recent loans. African entrepreneurs are also more likely to obtain credit in Uganda suggesting that policies aimed at improving access to bank finance to this group have had some success. This is also consistent with the lending behaviour of local banks that is observed.

A longer bank-firm relationship in Uganda and Tanzania has a significant negative impact on loan access. This indicates that newer relationships are more likely to be based on demand for credit while older relationships may emphasise the keeping of an account. The type of relationship between banks and firms appears to have evolved over time in these 2 countries. Finally, one sees that educational attainment significantly affects loan access in Tanzania. This could be the result of improvements in the quality of management skills in recent years. Moreover, the weaker effect of collateral compared to Table 3.7 suggests that for loans obtained in Tanzania between 2002 and 2003, educational attainment was a useful collateral substitute to some extent.

Table 3.9: Explaining Loans Obtained in 2002 and 2003

	Kenya	Uganda	Tanzania
Log of Replacement Value of Machinery&Equip.	-0.119	0.283***	0.166*
	(-1.15)	(2.58)	(1.91)
Log of Firm Age	0.088	0.225	-0.210
	(0.45)	(1.01)	(-0.82)
Log of Length of Relationship	-0.105	-0.349*	-0.489*
	(-0.60)	(-1.65)	(-1.81)
Log of Employment	0.358**	0.251	0.053
	(2.19)	(1.32)	(0.42)
Audited Accounts	-0.148	-0.073	-0.474
	(-0.22)	(-0.20)	(-0.71)
Local Bank	-0.458	1.025***	-0.331
	(-1.56)	(3.49)	(-0.95)
Local Ownership	0.133	-0.548	-
	(0.39)	(-1.33)	-
African Owner	0.142	0.624*	-0.178
	(0.36)	(1.67)	(-0.50)
Education Level of Manager	0.221	-0.070	0.726*
	(0.80)	(-0.21)	(1.77)
Agro	-0.267	-0.470	0.621
	(-0.66)	(-0.88)	(1.05)
Metal	0.314	-	0.020
	(0.68)	-	(0.03)
Furniture and Wood	0.209	0.183	0.482
	(0.42)	(0.30)	(0.05)
Chemicals	-0.380	-	0.641
	(-0.56)	-	(0.93)
Construction Materials	0.160	-1.168*	-
	(0.25)	(-1.74)	-
Plastics	0.363	-	0.672
	(0.73)	-	(0.64)
Paper, Printing & Publishing	1.094**	-0.323	0.009
	(2.36)	(-0.48)	(0.01)
Constant	-0.095	-7.203***	-3.37**
	(-0.06)	(-3.75)	(-1.79)
Number of Observations	115	159	122
Log-Likelihood	-62.57	-48.72	-36.62
Wald $-\chi^2$	14.28	33.28***	25.73***
Pseudo R^2	0.10	0.26	0.33

Dependent variable: Probability that a firm obtained a loan in 2002/2003.
*, **, and *** indicate significance at 10 percent, 5 percent, and 1 percent respectively. Numbers in parentheses are z statistics. The reference industry is textiles. In order for the model to be properly identified the metal, chemicals and plastics industry dummies are dropped for Uganda. In the case of Tanzania the local ownership variable and the construction dummy are dropped.

Including Profitability as an Explanatory Variable

An important factor determining whether or not firms are able to secure bank finance is profitability. Profitability controls for the observable risk of the borrower that influences the ability to repay the loan. The effect of profitability is ambiguous. Banks would be more willing to lend to profitable firms than to unprofitable ones. On the other hand, the pecking order theory of capital structure (Myers, 1984) suggests that firms prefer to finance investment with internal sources. However, profitability has been excluded up to this point because its inclusion leads to

the loss of a large number of observations, as many firms do not provide the data required to calculate it. Nevertheless, the importance of this variable both theoretically and empirically requires that the study explores its impact on access to bank finance.

The data allows us to measure profitability using the ratio of net income to replacement cost of fixed assets. For Kenya and Uganda the profitability figure is for 2001 and for Tanzania the figure is for 2002. Profitability is to a large extent a signaling variable. This means that the appropriate variable to use is expected profitability. Given that the data is cross sectional this variable is not available and the author makes do with current profitability. It is acknowledged that this is not a very good proxy for expected profitability. This is partly why we have included it as a robustness check rather than in the main regressions. However, it is anticipated that some insight into the impact that profitability has on access to bank finance will be obtained.

Table 3.10 shows the estimation when profitability is included as an explanatory variable. The impact of collateral observed in Table 3.10 is similar to what one observes in Table 3.9 and 3.7. Moreover, the results show that profitability is not important for all three countries. This surprising finding could be the result of the data problems that have been highlighted.

Table 3.10: Including Profitability to Explain Loan Access in the EAC

	Kenya	Uganda	Tanzania
Log of Replacement Value of Machinery&Equip.	-0.057	0.221**	0.291***
	(-0.39)	(1.95)	(2.47)
Log of Firm Age	-0.518	0.187	-0.238
	(-0.23)	(0.73)	(-0.96)
Log of Length of Relationship	-0.046	-0.295	-0.502**
	(-0.23)	(-0.93)	(-2.24)
Log Employment	0.255*	0.165	0.197
	(1.81)	(0.73)	(1.20)
Profitability	0.002	0.002	-0.090
	(0.68)	(0.37)	(-0.53)
Audited Accounts	-0.107	0.525	-
	(-0.16)	(1.16)	-
Local Bank	-0.034	0.754**	0.122
	(-0.10)	(2.06)	(0.36)
Local Ownership	0.065	-0.418	-0.157
	(0.16)	(-0.91)	(-0.23)
African Owner	0.189	0.541	-0.116
	(0.44)	(1.30)	(-0.33)
Education Level of Manager	0.248	0.083	0.079
	(0.84)	(0.20)	(0.18)
Agro	-0.462	0.186	0.811
	(-1.12)	(0.30)	(1.60)
Metal	0.303	-0.086	0.786
	(0.70)	(-0.10)	(1.16)
Furniture and Wood	0.537	0.680	1.305
	(0.97)	(0.91)	(1.50)
Chemicals	0.370	-0.953	1.388**
	(0.47)	(-1.08)	(2.06)
Construction Materials	-0.133	-	0.760
	(-0.17)	-	(0.91)
Plastics	-0.118	-	0.740
	(-0.23)	-	(0.89)
Paper, Printing & Publishing	0.632	-0.387	0.672
	(1.22)	(-0.46)	(0.93)
Constant	1.129	-6.104***	-6.834***
	(0.45)	(-3.15)	(-3.05)
Number of Observations	102	93	93
Log-Likelihood	-58.88	-38.97	-36.52
Wald $-\chi^2$	24.07	37.74***	28.86**
Pseudo R^2	0.16	0.28	0.26

Dependent variable: Probability that the firm had a loan at the time of the survey in 2002/2003.
*, **, and *** indicate significance at 10 percent, 5 percent, and 1 percent respectively. Numbers in parentheses are z statistics. The reference industry is textiles. In order for the model to be properly identified the construction and plastics industry dummies are dropped for Uganda. In the case of Tanzania the audited accounts variable is dropped.

Using an Alternative Measure of Collateral

To test further the robustness of the results an alternative measure of collateral is used. This measure is the share of the firm's machinery and equipment that is above ten years of age. Strictly speaking, this variable indicates a lack of collateral. Old machinery and equipment is harder to value and to sell in secondary markets. As a result, banks will be less willing to accept it as collateral. A larger share of old machinery and equipment will have a negative effect on access to bank finance. This alternative variable can address 2 problems associated with measuring collateral using replacement value. First, when the capital stock is very old as it is in Kenya and Tanzania, assigning a meaningful monetary value to these assets could be difficult. Second, firms can easily manipulate these figures to avoid tax obligations or to enjoy certain benefits put in place by government. Table 3.11 shows the results using the alternative measure of collateral. The profitability variable from the previous model is retained to see whether it will yield a different result in another model specification.

The share of machinery and equipment older than ten years of age has a significant negative effect on access to bank loans in Uganda and Tanzania. This means that not having collateral substantially reduces the likelihood that firms can access bank finance. It is consistent with the results of the previous specifications which showed that collateral has a meaningful positive impact on loan access in these two countries. In Kenya this variable has an insignificant positive effect. This is also in line with the results thus far. The results have proved to be robust to different specifications and alternative measures of collateral. Notably, in this last model profitability has a significant negative effect on loan access in Uganda, supportive of the pecking order hypothesis. This is also the only model where the explanatory variables are jointly significant for Kenya.

Table 3.11:An Alternative Measure of Collateral to Explain Loan Access in the EAC

	Kenya	Uganda	Tanzania
Share of Capital more than 10 years old	0.005	-0.017**	-0.015***
	(1.41)	(-2.39)	(-2.78)
Log Firm Age	-0.631***	0.551**	-0.013
	(-3.08)	(2.05)	(-0.05)
Log of Length of Relationship	-0.077	-0.358	-0.448**
	(-0.38)	(-1.10)	(-2.25)
Log Employment	0.270**	0.469***	0.469***
	(1.92)	(2.79)	(2.89)
Profitability	0.002	-0.008**	-0.341
	(0.99)	(-2.21)	(-1.50)
Local Bank	-0.026	0.680*	0.170
	(-0.07)	(1.76)	(0.49)
Local Ownership	0.112	-0.143	0.059
	(0.27)	(-0.30)	(0.09)
African Owner	0.109	0.062	0.394
	(0.26)	(0.14)	(1.00)
Education Level of Manager	0.247	0.404	0.473
	(0.83)	(0.97)	(1.13)
Agro	-0.576	0.129	0.199
	(-1.35)	(0.19)	(0.31)
Metal	0.222	-0.592	0.800
	(0.49)	(-0.73)	(1.07)
Furniture and Wood	0.371	0.424	0.576
	(0.68)	(0.55)	(0.72)
Chemicals	0.531	-0.707	0.428
	(0.67)	(-0.69)	(0.50)
Construction Materials	-0.113	-	0.273
	(0.02)	-	(0.35)
Plastics	-0.166	-	0.111
	(-0.32)	-	(0.12)
Paper, Printing & Publishing	0.525	-0.031	0.561
	(0.98)	(-0.04)	(0.67)
Constant	0.356	-3.051***	-2.231*
	(0.31)	(-2.72)	(-2.14)
Number of Observations	100	92	101
Log-Likelihood	-57.20	-37.74	-33.44
Wald $-\chi^2$	25.48*	32.81***	25.61*
Pseudo R^2	0.17	0.28	0.33

Dependent variable: Probability that the firm had a loan at the time of the survey in 2002/2003.
*, **, and *** indicate significance at 10 percent, 5 percent, and 1 percent respectively. Numbers in parentheses are z statistics. In the case of Uganda the model is properly identified when the construction materials and plastics industry dummies are dropped. The reference industry is textiles.

Possible Selection Bias

Another problem that arises with cross-sectional data is selection bias (see Heckman, 1979). In the context of the problem one could argue that 2 decisions are taken, one by firms and the other by banks. First, firms must make a decision to apply for a bank loan. That is, firms decide whether they have demand for bank loans.

After firms decide to apply for credit, banks must decide whether or not to extend loans to these firms. In their decision to supply loans, banks will be interested in maximizing their expected profits. This means that in the event that firms default, banks can effectively use the collateral mechanism to recoup the loan. The ability of firms to pledge collateral is among the key determining factors in the banks' decision.

Similar to Bigsten et al (2003) the 2 decisions can be viewed as 2 stages of the loan market process. Selection bias could be present if one investigates the decision by banks to provide credit without first examining the decision by firms to apply for it. This 2 stage process can be estimated using a bivariate probit model with sample selection, otherwise known as a Heckman probit. An equation for each stage is estimated. The model assumes that the errors from these two equations have a standardized bivariate normal distribution with correlation coefficient ρ, (for a detailed discussion see Dubin and Rivers, 1990).

To explain the first stage, explanatory variables that are most useful in explaining loan demand are used. Firms decide based on the extent to which their own funds are unable to meet their working capital and investment requirements, and the availability of collateral and collateral substitutes. Entrepreneurs may be more willing to apply for loans from locally owned banks if these banks are perceived as being less conservative than foreign banks. It is expected that demand for bank loans will be affected by ethnicity. African entrepreneurs are likely to have less access to internal sources of finance. Similarly, locally owned firms could have less access to internal sources compared to foreign firms. More highly educated entrepreneurs are in a better position to lodge successful loan applications. They can formulate better business plans and are less likely to be intimidated by the paper work associated with applying for a loan. Larger firms have greater market power and more reputation. Their demand for loans is expected to be higher than for small firms. Firm age will also affect loan demand. Older firms may have better access to retained earnings, thus have less demand for loans. Alternatively, older firms could have more reputation which increases loan demand. Industry specific characteristics could also explain the demand for loans.

Collateral is expected to be the key factor in the second stage. Other factors that are crucial for the second stage include the length of the bank-firm relationship and whether or not the bank is locally owned. The literature suggests that relationship banking explains bank lending behaviour more than it does firm loan demand. Locally owned banks may be less conservative in their

lending practices compared to traditionally conservative foreign banks. Furthermore, banks are more likely to provide loans to firms that keep audited accounts. Larger, older firms will be viewed as more credit worthy than smaller, younger ones. Again, industry specific differences may be important for bank decision to provide credit.

The results of the Heckman probit are given in Table 3.12 below. The replacement value of machinery and equipment is used to measure collateral. Convergence was obtained only for Uganda and Tanzania. This is not surprising given the poor explanatory power of the previous models for Kenya. Moreover, Uganda and Tanzania are the countries of interest given that collateral was found to be insignificant in Kenya. Attempting to include the profit variable also led to non-convergence so it is excluded in the model reported in Table 3.12.

The results suggest that there is no sample selection bias in either country. This is similar to the findings of Bigsten et al (2003). However, the sample selection model does provide some interesting results. It shows that in Uganda collateral is not significant for the decision made by banks, but is important for the decision made by firms. This suggests that the low cost of enforcement affects firm behaviour, but not bank behaviour. Collateral is not necessarily viewed as an effective enforcement mechanism by Ugandan banks. However, Ugandan firms seem to rely on collateral to signal their quality to banks. Firms without collateral are unable to send such a signal and thus are less likely to apply for loans.

In contrast, collateral is unimportant for the decision to apply for loans in Tanzania, but is significant for the decision to supply credit. Thus, in Tanzania the legal environment affects bank behaviour more than it does the decisions taken by firms. This means that Tanzanian banks view collateral as an effective enforcement mechanism. This finding agrees with the substantially higher share of Tanzanian firms whose loan applications were rejected due to inadequate collateral observed in chapter 2. In Tanzania, banks clearly prefer to provide loans to firms with collateral.

Table 3.12: Sample Selection Model

	Applied for a Loan (Selection Equation)			
	Uganda	z-statistic	Tanzania	z-statistic
Log of Replacement Value of Machinery&Equip	0.141***	2.43	0.030	0.47
Local Bank	0.497**	2.30	-0.122	-0.47
Log of Employment	0.097	0.122	0.219*	1.80
Log of Firm Age	0.284**	2.12	-0.094	-0.77
African Owner	0.361	1.42	0.710***	2.93
Local Ownership	-0.513*	-1.73	0.531	1.02
Education Level of Manager	-0.071	-0.30	0.207	0.77
Agro	-0.432	-1.08	0.352	0.87
Metal	-0.748	-1.48	0.373	0.74
Furniture	-0.397	-0.90	-0.274	-0.54
Chemicals	-0.398	-0.72	0.502	1.04
Construction	-0.686	-1.44	0.625	0.90
Plastics	5.902***	11.11	0.758	1.06
Paper	-0.905*	-1.83	0.235	0.49
	Obtained a Loan (2nd Stage Probit)			
	Uganda	z-statistic	Tanzania	z-statistic
Log of Replacement Value of Machinery&Equip	0.183	1.25	0.237**	2.12
Log of Length of Relationship	-0.614**	-2.29	-0.080	-0.38
Log of Employment	0.221	1.20	0.292	1.53
Log of Firm Age	-0.151	-0.80	-0.518*	-1.74
Audited Accounts	0.128	0.28	0.339	0.56
Local Bank	0.343	0.85	-0.286	-0.62
Agro	-0.468	-0.75	0.009	0.01
Metal	-0.587	-0.66	0.473	0.60
Furniture	-0.060	-0.09	1.168	1.02
Chemicals	-1.661**	-1.93	0.240	0.27
Construction	-2.045**	-2.22	0.241	0.23
Plastics	-1.353*	-1.69	0.218	0.24
Paper	0.150	0.20	0.071	0.09
Constant	-2.062	-0.77	-5.50***	-2.65
Number of Observations	205		145	
Log-Likelihood	-151.60		-109.41	
Wald $-\chi^2$	21.25*		29.81***	
Wald Test on Selection Term	1.48		0.33	

Dependent variables: In stage 1 is the probability that a firm applied for a loan. In stage 2 is the probability that the firm obtained the loan.
*, **, and *** indicate significance at 10 percent, 5 percent, and 1 percent respectively. The reference industry is textiles.

It is worth noting that African entrepreneurs in Tanzania are more likely to apply for loans than entrepreneurs from other ethnic groups. This confirms the author's thoughts about African entrepreneurs having less access to internal sources of finance. The results also show that better access to loans from local banks in Uganda is a result of more applications being made to these banks, not necessarily because they banks are more likely to provide loans. In addition, although Ugandan firms in the plastics industry have by far the greatest demand for loans relative to firms in other industries, banks are less likely to provide credit to these firms. As in Table 3.8, the chemicals and construction materials industries in Uganda can be expected to receive less credit.

3.5 Conclusions

Existing literature suggests that given the poor state of the legal systems in SSA countries, collateral is ineffective as a mechanism of enforcing formal loan contracts. However, the empirical evidence on this issue is extremely limited. This chapter attempted to address this gap. Given the argument that collateral may be unable to play its role adequately in SSA, this paper also investigated the role that collateral substitutes can play to improve access to bank finance. The main contribution of this paper in this regard was to examine the role, if any, of relationship banking.

The chapter found that a very high proportion of loans are collateralised in the 3 EAC countries. Moreover, firms in all countries have assets that they are able to pledge as collateral. The results based on probit estimations showed that the replacement value of machinery and equipment has a significant effect on access to bank loans in Uganda and Tanzania, but not in Kenya. This finding is robust across several model specifications, and alternate measures of collateral. Collateral has a role to play in the transmission mechanism in Uganda and Tanzania. This is interpreted as evidence supporting the view that collateral is more relevant for debt contracts when the costs of enforcement are kept relatively low. The marginal probability elasticity of collateral was however found to be relatively small for both countries. Although collateral is important, it is not the most important determinant of access to bank loans.

The analysis showed that collateral in the form of real estate does not have an effect on loan access in all 3 EAC countries. This suggests that the legal environment in these countries, particularly in Uganda and Tanzania, is better suited to support creditors trying to repossess machinery and equipment compared to creditors attempting to repossess real estate. The results show that in the context of SSA countries, it is not only whether firms have collateral that is important. Perhaps more

crucial in these countries where weaknesses in the legal systems exist, is the *type* of collateral that firms own.

Collateral addresses information asymmetry problems that are abundant in Africa, and therefore should play some role in bank lending. In line with this view, the results showed that collateral has an important role to play where information asymmetry is more acute. Interestingly, having audited accounts does not significantly improve access to bank loans. Thus, the countries in the EAC (particularly Uganda and Tanzania) will benefit from improving the quality of their financial information.

The most important collateral substitute in the EAC appears to be reputation. It is particularly important in Kenya where both real estate and machinery and equipment are found to be ineffective as contract enforcement mechanisms. Little evidence was found supporting the hypothesis that relationship lending can have a positive effect on access to bank finance. Evidence from Uganda and Tanzania indicates that the type of relationship between banks and firms has evolved over time. Recent relationships are more likely to be credit based than older ones. The evidence is to some extent consistent with the limited studies pertaining to other non-developed countries. It shows that there may be a need to improve on the quality of information available to banks in their lending relationships with firms, and that researchers need to explore innovative avenues of solving information asymmetry that are more relevant to SSA. However, the results may also point to the limitations the data impose on measuring relationship lending adequately.

The sample selection model gave interesting insight into the role of collateral. According to this model, collateral is only important for the decision to apply for loans in Uganda, not for the decision to supply credit. This suggests that despite Uganda having the lowest enforcement costs in the EAC, banks in that country do not necessarily view collateral as an effective enforcement mechanism. Rather it is the firms that see a meaningful role for collateral. Ugandan firms appear to use collateral to signal their quality to banks. Firms without collateral are not in a position to send such a signal and thus are less likely to apply for bank finance. In contrast, Tanzanian banks supply credit based on collateral although firms do not consider collateral to be an important determinant in their decision to apply for credit. The sample selection results suggest that from the point of view of banks, secondary markets for machinery and equipment play more of a role for the functioning of the collateral mechanism in Tanzania compared to Uganda.

CHAPTER 4: THE LEGAL ENVIRONMENT AND NON-BANK FINANCE: TRADE CREDIT AND LEASING FINANCE

4.1 Introduction

Trade credit is a very important source of external finance for African manufacturing firms. For example, it is the most important source of finance for Zimbabwean firms accounting for up to a third of all outstanding balances across all size categories (Fafchamps et al, 1995). It is reported to be the most important source of non-bank credit for Kenyan firms (Fafchamps, 1994). Based on a sample of six countries, Bigsten et al (2003) report that for the majority of manufacturing firms trade credit is the most important source of finance for working capital needs. Trade credit was received by 62 percent of the sampled firms. Therefore, continued research into the nature of trade credit in Africa is a meaningful exercise that can provide useful insights on ways to improve credit access by manufacturing firms.

A key contribution of this chapter is to empirically examine how collateral affects the likelihood that a firm uses trade credit. If trade credit is a viable substitute for bank finance then a negative relationship between collateral and trade credit is expected. This would indicate that trade credit is useful in an environment where firms do not have adequate collateral, or where weaknesses in the legal system make the collateral mechanism ineffective. This chapter also examines how the legal environment affects the supply of trade credit. Trade credit has the potential to bypass some of the weaknesses that characterize legal systems in African countries because it does not depend directly on collateral. However, although trade credit is not collateralised, it still requires that those providing it use the court system to resolve disputes over payments.

Another contribution of this chapter is to assess the role of formal mechanisms that are not based on the court system in settling disputes between firms. Specifically, the author examined whether membership to a business association can be beneficial in resolving disputes. Previous works have focused more on how informal mechanisms (for example networks based on ethnicity) affect trade credit. It is also important to examine whether formalized institutions can supplement the legal system, particularly because it may be easier to pursue policies that can enhance their effectiveness as compared to informal institutions.

Much less is known about the use of leasing finance in African manufacturing compared to bank finance and trade credit. This is partly attributed to the fact that leasing finance is generally still in its infancy in Sub-Saharan Africa (SSA) (Kisaame, 2003). To the best knowledge of the author this chapter is the first attempt to examine the relationship between measures of the legal environment and leasing finance in African manufacturing.[25] The legal environment is expected to be an important factor given that leasing is based on a formal contractual agreement between the lessor and lessee.

4.2 Trade Credit

4.2.1 Literature Review

An examination of the literature motivating the use of trade credit is conducted in this section. Both theoretical and empirical literature is examined. Important gaps are identified that provide guidance in formulating meaningful hypotheses to be tested in the study.

Supply Side Theories of Trade Credit

The literature has several explanations for why firms extend trade credit. One of the oldest views explain trade credit to be a result of financial market imperfections. This is referred to as the financial or liquidity motive and arises mainly due to imperfections in credit markets. This motive stems from the fact that some firms have easier access to credit markets compared to their customers, providing them with an incentive to use their borrowing capacity to pass credit to these customers (Schwartz, 1974). It is argued by Emery (1984) that the existence of barriers to bank credit and the resulting non-competitive rents they generate presents an opportunity for non-financial firms to extend credit to excluded market participants.

The imperfect financial markets view of trade credit leads to the argument that bank credit is 'redistributed' to financially weaker firms by more financially sound firms in the form of trade credit. The redistribution hypothesis was first proposed by Meltzer (1960) and supported by among others Petersen and Rajan (1997) and Nilsen (2002). According to Love et al (2005), for redistribution to actually occur it must be the case that some firms are able to raise external

[25] We note that Kisaame (2003) and Mutesasira et al (2001) provide some discussion on the relationship between the legal environment and leasing finance in Uganda and Tanzania.

credit, which they then pass on to weaker firms. Related to the redistribution argument is the 'complementarity hypothesis' of Demirguc-Kunt and Maskimovic (2001). The complementarity view argues that trade credit use is greater in countries with large and efficient financial intermediary sectors. Non-financial firms act as agents for financial intermediaries by lending to and borrowing from other firms when they have a comparative advantage in enforcing these credit contracts.

The extent to which the intermediate goods supplied can serve as collateral also affects the willingness of suppliers to extend trade credit (Mian and Smith, 1992; Petersen and Rajan, 1997). The more durable the goods supplied, the more valuable they are as collateral and hence the more credit the supplier can extend to buyers. In addition, the longer the intermediate goods remain in their original state the more useful they are as collateral to the seller who can repossess them and sell them to another buyer. This means that the state and quantity of raw materials held in inventory by buyers has an impact on the decision of suppliers to provide trade credit. Frank and Maskimovic (2004) explain that inputs provide collateral supporting trade credit while finished goods do not. The proportion of the sale that is financed by trade credit increases with the value that can be recovered in the event of repossession.

Asymmetric information can also be found in product markets. This implies that there will be uncertainty about the quality of goods delivered by suppliers. In this instance trade credit arises out of a verification motive. By providing trade credit, suppliers give buyers a period to verify the product prior to payment (Smith, 1987). Trade credit sends a positive signal about the quality of the product by affording the buyer an inspection period through deferred payment. This can give the supplier a distinct advantage over competing suppliers.

Price discrimination can lead suppliers to extend credit to their buyers (Meltzer, 1960; Petersen and Rajan, 1997). Given that credit terms are on the whole uniform for buyers of varying credit quality, low quality buyers enjoy an effective reduction on the price of goods and services (Petersen and Rajan, 1994). Low credit quality firms have relatively inelastic demand, allowing suppliers to exploit high profit margins. With respect to high quality borrowers the price of trade credit will be considered as too high, motivating them to make quick repayments. In contrast, risky buyers find the cost of trade credit lower than other sources such as bank credit. An alternative explanation for price discrimination is that the supplier has an interest in the long-

term survival of the buyer. The supplier factors in the present value of profits on future sales in extending trade credit. Thus, the supplier is viewed as having a quasi equity stake in the firm.

Trade credit terms can be used to strengthen the competitive position of suppliers. According to the sales promotion motive, trade credit terms are effective in increasing or maintaining market share, and in downloading excess inventory (Nadiri, 1969). Extending trade credit allows a supplier to gain an advantage over the competition because the buyer is continuously holding his products. At the same time, the seller transfers inventory costs (for example storage costs) to the buyer. Based on this argument the length of the credit terms will be positively related to the amount of time the goods are part of the buyer's inventory. Trade credit is also used to establish long-term relationships with buyers in the expectation that they will provide a loyal clientele for the products of the seller. In this case trade credit is an investment used to maintain sales at a given threshold within a secure relationship between suppliers and buyers (Ziane, 2004).

Demand Side Theories of Trade Credit

Trade credit demand can also be motivated by the presence of financial and product market imperfections. The basis for these theories is the presence of information asymmetry between suppliers and their customers (see Ferris, 1981). With regard to financial markets the decision to take trade credit depends on the availability and relative prices of alternative sources of finance. Credit rationing as an equilibrium result in loan markets (Stiglitz and Weiss, 1981) implies that firms may demand trade credit at rates higher than those required by banks and other financial institutions. Given that credit rationing by banks is a function of risk, firms perceived to be high risk are likely to have a higher demand for trade credit.

Related to the imperfect financial markets argument is the observation that trade credit demand arises because suppliers do not have the traditional collateral requirements of banks (see for example Fafchamps, 1997). The relationship between the supplier and the buyer generates information that improves the monitoring and enforcement of payments (Petersen and Rajan, 1997). This implies that compared to bank credit, trade credit is less dependent on formal collateral as a means to signal the credit quality of the buyer. Cunat (2004) develops a model showing that the lower the level of collateralizable assets a firm has, the higher the expected demand for trade credit.

When information asymmetry is present in product markets, firms demand trade credit because it affords them a period to inspect the quality of the product prior to paying. Smith (1987) explains that this sends a signal about the quality of the product. Incomplete information about the quality of the goods or the characteristics of the seller may encourage buyers to use trade credit rather than pay cash. This provides them with some protection against opportunistic behaviour by the seller.

Trade credit demand is also said to arise from a transactions cost motive. According to this view trade credit reduces transactions costs by promoting efficiency in cash management (Ferris, 1981; Petersen and Rajan, 1997). Trade credit reduces the frequency with which payments must be made to suppliers, and the cost of holding cash balances. Even if capital markets were perfect, uncertainty about whether delivery and payments will be synchronized leads to costs associated with holding idle resources in the form of cash balances. By using trade credit firms can accumulate their payment obligations and pay them at regular intervals. This allows them to estimate their cash requirements with greater certainty and consequently to hold smaller cash balances. The implication of this is a lower opportunity cost of holding cash than would have been the case without trade credit.

4.2.2 Empirical Evidence on Trade Credit

African and International Evidence

Using RPED data, Fafchamps et al (1994) find that the use of trade credit in Kenya increases with firm size. Their evidence suggests that micro enterprises are rationed out of the trade credit market and that small firms in Kenya are not heavy users of trade credit. Ethnicity is also found to be an important factor, with Black-owned enterprises receiving the least trade credit. They also find that almost all firms that provide trade credit experience some problems with payment. 58 percent of firms stated that legal action would be the most likely reaction to non-payment. However, given the size of transactions required to justify the costs associated with courts and lawyers, legal enforcement is used mainly by large firms.

Bade and Chifamba (1994) find that in the case of Zimbabwe firms are more likely to secure trade credit if they purchase regularly in bulk, if they are more profitable, and if they have an overdraft facility. Fafchamps et al (1995) show that larger firms and non-Black owned firms are

more likely to receive trade credit in Zimbabwe. Discrimination against blacks exists regardless of firm size. They find that the initial response of firms to payment problems is direct negotiation. Should negotiations fail firms proceed to hire a lawyer and threaten to take legal action.

In a later study on trade credit in Zimbabwe Fafchamps (1997) finds that Zimbabwean firms use a combination of formal screening, statistical discrimination, reputation and acquaintance in selecting recipients of trade credit. Large firms use credit application forms, and bank and trade references to screen firms applying for trade credit. Reputation and relationships are found to be important mechanisms for accessing trade credit and enforcing payment.

Fafchamps (1999) finds that network effects (the impact of socialization and information sharing) are significant determinants of access to supplier credit by Black-owned and female headed enterprises in Kenya and Zimbabwe. He finds that ethnicity and gender have minimal effects on access to bank credit. However, these attributes have a strong negative impact on the ability of entrepreneurs to access trade credit. His results indicate that blacks and women are penalized for their lack of connections with the business community, and their inability to effectively signal their credit worthiness amongst a pool of inexperienced micro enterprises.

Fisman and Raturi (2000) investigate the impact of competition on relationship development using trade credit data for 5 African countries. They show that competition among firms has a positive effect on incentives to establish long-term cooperative relationships. For an average firm the probability of obtaining trade credit increases from 40 percent to 60 percent after switching from a monopolistic market to a competitive supplier market. A high level of competition makes switching suppliers very costly and hence promotes 'lock-in' between suppliers and buyers. Based on data for 5 African countries Fisman (2001) finds that supplier credit has a positive impact on capacity utilization. He argues that an increase in trade credit may have a significant positive effect on productivity. His results also suggest that supplier credit is particularly important for firms with high liquidity constraints.

Using firm level data for a group of 6 emerging economies, Love et al (2005) investigate the effect of financial crises on trade credit use. They find that financially weaker firms are more likely to reduce the provision of trade credit to their customers in the event of a financial crisis. Their findings also indicate that firms with a higher dependence on short-term bank debt are the

main suppliers of trade credit during non-crisis periods. During times of crisis they observe a significant positive relationship between bank credit growth and the provision of trade credit. They conclude that their results are consistent with the 'redistribution hypothesis' of trade credit provision. That is, firms successful in securing bank finance 'redistribute' it to firms unable to do so in the form of trade credit.

Cunat (2004) develops a model in which trade credit arises from the commercial and technological links between firms. Based on a sample of UK firms he finds that trade credit increases with firm age. This is taken as support for the hypothesis that trade credit is a result of specificity between a supplier and its customers. In addition, trade credit is used once other forms of credit have been fully utilized. He also finds that the share of trade credit relative to other forms of finance is significantly affected by collateral. Lower levels of collateral are associated with a higher proportion of trade credit. This is considered to be consistent with the view that firms exhaust other sources of credit before using trade credit.

One of the most widely cited empirical works on trade credit is Petersen and Rajan (1997). The study is based on American small firms using data from the National Survey of Small Business Finances. They find that firms of higher credit quality (measured by size and profitability) receive more credit. Suppliers are found to have an advantage in information acquisition compared to financial institutions. For example, suppliers can visit buyers more often than banks can. The size and timing of the buyer's orders also indicate the state of the buyer's business. Their results also show that the higher the proportion of raw materials in inventory, the greater the amount of trade credit provided. Their conclusion is that suppliers have a financing advantage stemming from their low cost of information acquisition and their ability to efficiently liquidate assets.

Wilson et al (1997) investigate the determinants of trade credit usage for a sample of small UK firms. Firms with a higher degree of financial risk (proxied by profitability and the debt ratio) have a greater demand for trade credit. Business risk (proxied by firm age) is positively related to trade credit demand. Firms with more concentrated ownership use relatively more trade credit. They argue that this suggests owner-managers take more risk than hired managers. Using a sample of French SMEs, Ziane (2004) examines the determinants of trade credit use. He finds that a higher volume of transactions, and greater financial and business risk, are associated with a greater demand for trade credit.

4.2.3 Some Evidence on the Link between Trade Credit and the Legal Environment

The empirical evidence surveyed thus far tests the standard theories of trade credit. Given that there is no clear theoretical basis for linking trade credit to the legal environment, empirical evidence on this relationship is limited. Nevertheless some studies do exist, and are reviewed in this section.

Demirguc-Kunt and Maksimovic (2001) find that the usage of trade credit compared to bank credit declines as the efficiency of the legal system increases. They obtain this result based on a sample of 39 developed and developing countries. They also find that trade credit is more prevalent in countries with better developed financial systems. This finding is particularly strong when the share of government ownership in the banking sector is low, implying greater efficiency in financial intermediation. Their evidence is supportive of the 'complementarity view' of trade credit.

Bigsten et al (2000) find that small manufacturing firms in Africa prefer direct negotiation to legal action when settling contractual disputes over late payments for trade credit and late delivery of inputs. Mainly large firms use lawyers and courts in the event that negotiations fail. They argue that this might reflect a cultural preference for non-confrontational methods of settling disputes. The length of the relationship between parties is found to reduce the probability of going to court. Their evidence suggests that countries with better legal institutions are also the countries where breach of contract and the use of lawyers are most prevalent. They interpret this observation to mean that firms operating under good legal institutions take more risk, which promotes trade and leads to more cases of contractual breach and consequently more usage of courts and lawyers. Their conclusion is that the African manufacturing sector operates in an environment where contractual disputes are frequent but are mainly dealt with through direct negotiation.

McMillan and Woodruff (1999) explore how Vietnamese firms prevent disputes without the use of courts based on a survey of manufacturing firms. They find that firms cannot rely on courts, and thus use repeated game incentives in their contractual agreements. 90 percent of managers surveyed reported that courts are irrelevant in enforcing contracts or resolving disputes. In this context contracting is upheld by the threat of loss of future business. Firms also rely on additional mechanisms depending on the risk of business partners. Transactions involving greater

risk are characterized by more elaborate governance structures involving written contracts and advance payment. They also find that firms investigate potential trading partners prior to entering a relationship, in some cases relying on social networks for information.

Using firm-level data Hendley et al (2000) investigate how Russian firms enforce agreements with trading partners. They find that Russian firms have a strong preference for using direct enterprise-to-enterprise negotiation to resolve contractual problems. Their results also suggest that firms prefer doing business with long term partners, an observation that is consistent with the difficulties of doing business in Russia. Furthermore, they find that many Russian firms use the courts to resolve disputes. During 1996 40 percent of surveyed firms had initiated 6 or more law suits. They conclude that after direct negotiation between firms, threatened or actual use of courts is the most important method of contract enforcement in Russia.

According to Johnson et al (2002a) courts have a role to play even when they function inefficiently. They identify 2 roles for courts. First, they ensure that bills are paid. Second, they help to clarify the responsibilities of the contracting parties in the event of dispute, which facilitates their day-to-day interaction. Based on a group of 5 post-communist countries, they find that entrepreneurs who state that the courts work provide significantly more trade credit than entrepreneurs who state that courts do not work. They highlight that these countries all scored poorly in international comparisons measuring the fairness of the judiciary. They also find that functioning courts make it easier for new relationships to be established, implying that they act to stimulate business activity.

Shvets (2006) empirically investigates how the predictability of court decisions affects the willingness of creditors to provide loans in Russia. She defines predictability as the ability of entrepreneurs to predict a court decision in a particular case based on information available to them. This information is based on what they know about the written law and what they have observed about enforcement through the courts in the past. Based on firm level data she finds that judicial predictability has no effect on the size of trade credit. However, it has a significant positive effect on both the likelihood and size of bank credit. She argues that her findings are consistent with the view that compared to banks, trade credit suppliers have opportunities for better monitoring of borrowers and alternative methods of contract enforcement which rely less on courts.

Based on a group of 5 transition economies Pyle (2005) examines whether membership to a business organization contributes to the level of inter-firm communication about disputes with trade partners. He assumes that access to the association's information network reduces the risk associated with providing trade credit by aiding relational contracting and reducing informational asymmetries. His evidence shows that some business associations significantly increase the flow of information relating to contractual disputes even after controlling for pre-existing informal communication. He also finds that if firms are skeptical about the ability of courts to protect them from opportunistic behaviour by trade partners, they may be more active in using the business association as a means of finding out information about their partners' past behaviour.

4.2.4 Summary of Literature Review on Trade Credit

In the case of Africa, firm size and ethnicity are found to be important factors affecting access to trade credit by manufacturing firms. Interestingly, large firms providing trade credit in Zimbabwe use bank references as a basis for selecting recipients of trade credit. Firms with overdraft facilities are more likely to obtain trade credit. This implies that it is firms that are able to access bank credit that will be able to obtain trade credit. If this is the case trade credit will be complementary to bank credit rather than substitute for it.

The literature review indicates that the empirical evidence on the relationship between the legal environment and trade credit is limited, particularly so for SSA. More research is required to obtain a better understanding of this relationship. Finally, to the best knowledge of the author there is no study that examines how membership in a business association affects dispute resolution among firms in SSA. This study aims to fill these gaps.

4.3 Empirical Analysis of Trade Credit Use and Supply in the EAC

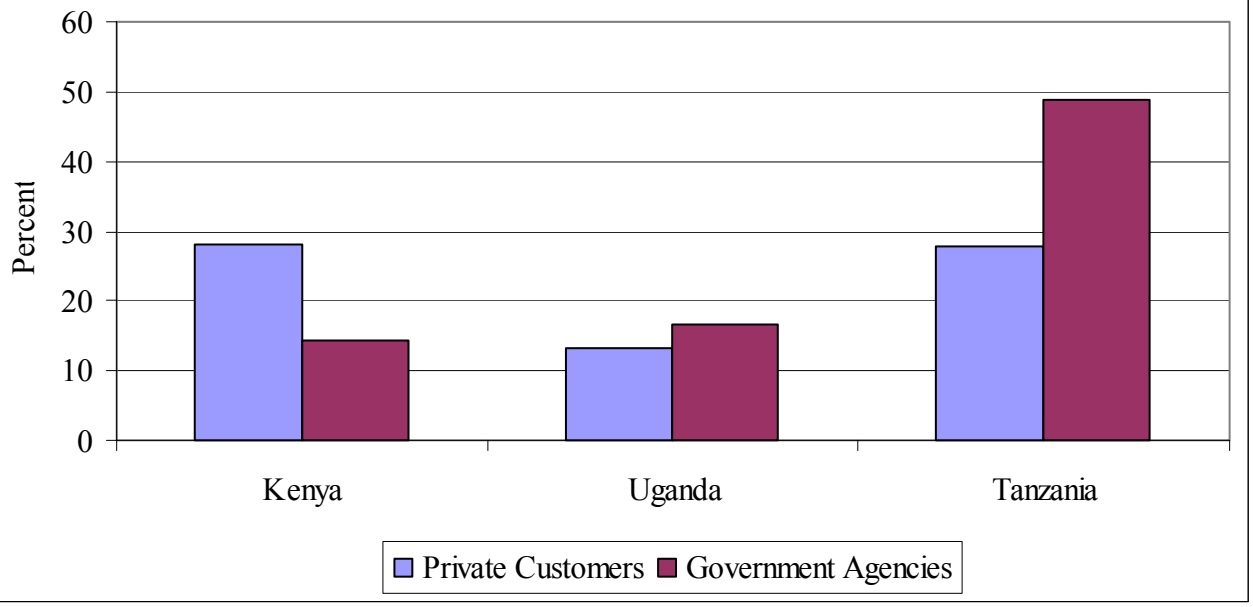
In this section descriptive and parametric analyses of trade credit use and supply in the EAC are undertaken. The investigation is based on 4 hypotheses.

Hypothesis 1: The quality of the legal system affects the extent to which firms use courts to settle payment disputes.

Rationale: Firms operating in an environment where their rights as creditors are clearly defined will be more willing to use the courts to enforce these rights in the event of a dispute. In addition, lower enforcement costs will encourage firms to make greater use of courts.

Hypothesis 1 is tested by examining how the extent to which the use of courts to settle disputes correlates with the legal indicators in chapter 2. The first observation is that the problem of overdue payments appears to be most serious in Tanzania, particularly with respect to government agencies. Notably, in Kenya, 28 percent of sales to private agents result in overdue payments. Overdue payments occur least in Uganda where on average 13 and 17 percent of private customers and government agencies pay late respectively.

Figure 4.1: Average Share of Sales Resulting in Overdue Payments (%)



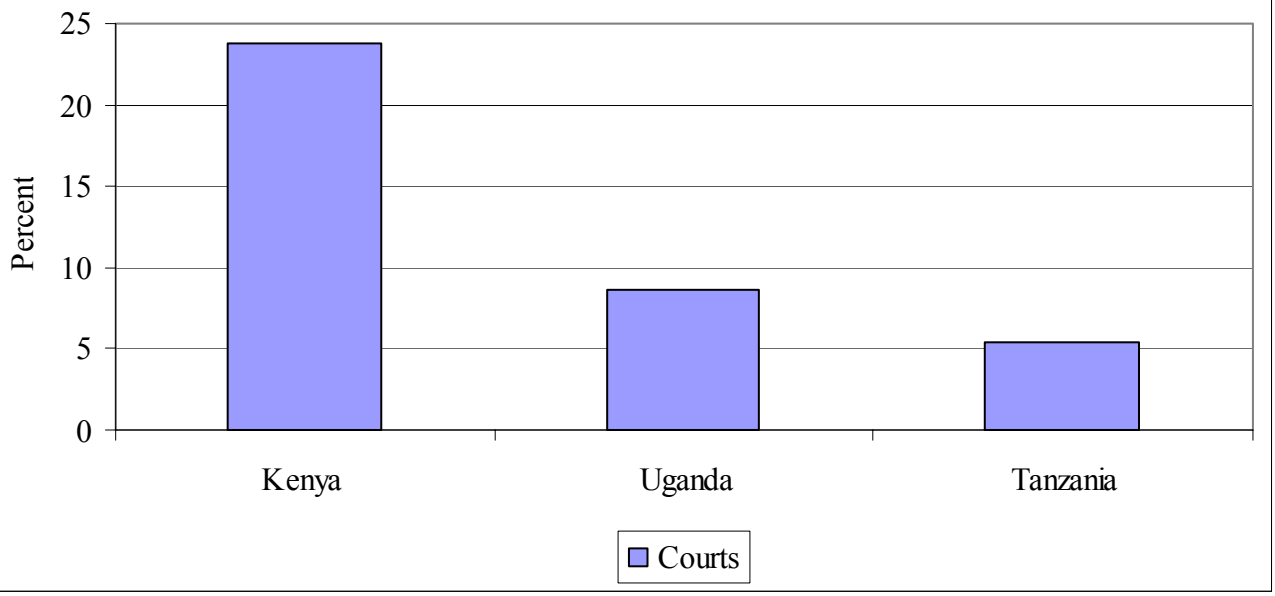
Source: World Bank (2002/03), Investment Climate Surveys
Kenya (n=223) Uganda (n=293) Tanzania (n=123)

Based on Figure 4.1 one may expect that the use of courts would be greatest in Tanzania. However, Figure 4.2 shows that Tanzania has the least court usage. Kenyan firms are far more likely to use courts as a means of resolving disputes. It appears as though an environment of better legal protection is associated with more use of courts. Consistent with hypothesis 1, Kenya with significantly better creditor rights than the other two countries (see chapter 2), has a significantly greater share of firms using courts. It is likely that trade credit contracts in Kenya are more clearly covered in the written law compared to Uganda and Tanzania. In addition, although Kenya and Uganda have a smaller share of firms with overdue payments than Tanzania, they have a higher

share of firms using courts. Chapter 2 showed that Tanzania has the poorest quality written law which may explain why firms hardly use courts to resolve trade credit disputes. However, contrary to hypothesis 1, Figure 4.2 shows that enforcement does not matter much for the prevalence of court use. Kenya which has the most costly enforcement also has the highest use of the court system.

Recall from chapter 2 that contract enforcement in Kenya is costlier than in Uganda and Tanzania. This is for both indicators, namely the number of days it takes to recover overdue debt and the percentage of debt paid. One may ask whether these indicators are appropriate as measures of enforcement. It is possible that there could be reverse causality between the cost of enforcement and demand for court services. For example, higher demand for court use in Kenya may lead to a backlog of cases resulting in long waiting periods before disputes are resolved. This demand for court services is not present in the other countries and may partly explain why the cost of enforcement measured in terms of days to recover overdue debts is higher than in the other countries.

Figure 4.2: Share of Firms that use Courts (%)



Source: World Bank (2002/03), Investment Climate Surveys
Kenya (n=89) Uganda (n=52) Tanzania (n=98)

Looking at Figure 4.1 and 4.2, it is interesting to note that Tanzania which has the smallest share of firms using courts also has on average the largest share of sales resulting in overdue payments. This suggests that the alternative enforcement mechanisms being used in Tanzania are ineffective to some extent. An enforcement mechanism is effective not only because it efficiently and fairly resolves a

dispute, but also because it poses a credible threat to deter firms that have received trade credit from taking advantage of their suppliers. Kenya has the greatest share of private customers not honouring their payments in a timely manner. This opportunistic behaviour may reflect the high enforcement costs. That is, firms anticipate that court action is too costly for their suppliers and default as a result. In contrast, Uganda which has the lowest enforcement costs has on the whole the least problems with overdue payments. In particular, a substantially lower share of private customers in Uganda fails to pay on time. This suggests that the threat of court action in Uganda is a credible threat because the courts are relatively efficient. It may partly explain why there is a smaller share of Ugandan firms actually using the courts compared to Kenya.

Therefore, the analysis suggests that courts are more important for resolving disputes in Kenya than in Uganda and Tanzania. However, courts appear to be more of a deterrent to opportunistic behaviour in Uganda relative to the other 2 countries. This is mainly a function of the more efficient enforcement that obtains in Uganda. Courts are least important in Tanzania where both legal rights and enforcement are relatively weak.

Hypothesis 2: Membership in a business association is more useful for resolving disputes when courts are less efficient.

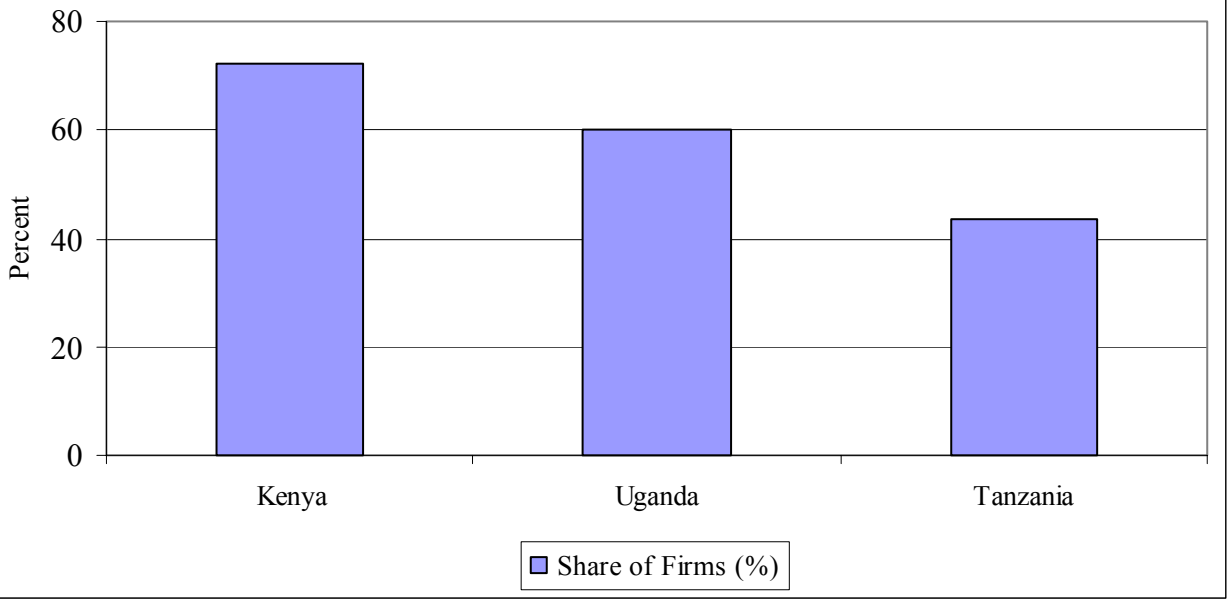
Rationale: Business associations provide a channel through which firms can settle contractual disputes without having to incur the high costs associated with using courts. These associations can also enhance the flow of information between firms and therefore potentially reduce mistrust between firms.

Hypothesis 2 is tested by examining the correlation between firm perceptions about how effective business associations are in settling disputes, and the measures of contract enforcement presented in chapter 2. Firms were asked to rate the services provided by their association is resolving disputes on a scale from 0 to 4, where 0 means the services have no value and 4 means they have critical value.

Figure 4.3 shows that Kenya has the highest share of firms belonging to business associations while Tanzania has the least. This suggests that there may be more benefits from being a member of an association in Kenya compared to the other countries. For example, Kenyan associations

could provide better service in terms of lobbying government. More relevant to the study, it may be that Kenyan associations are better equipped to deal with disputes over trade credit payments.

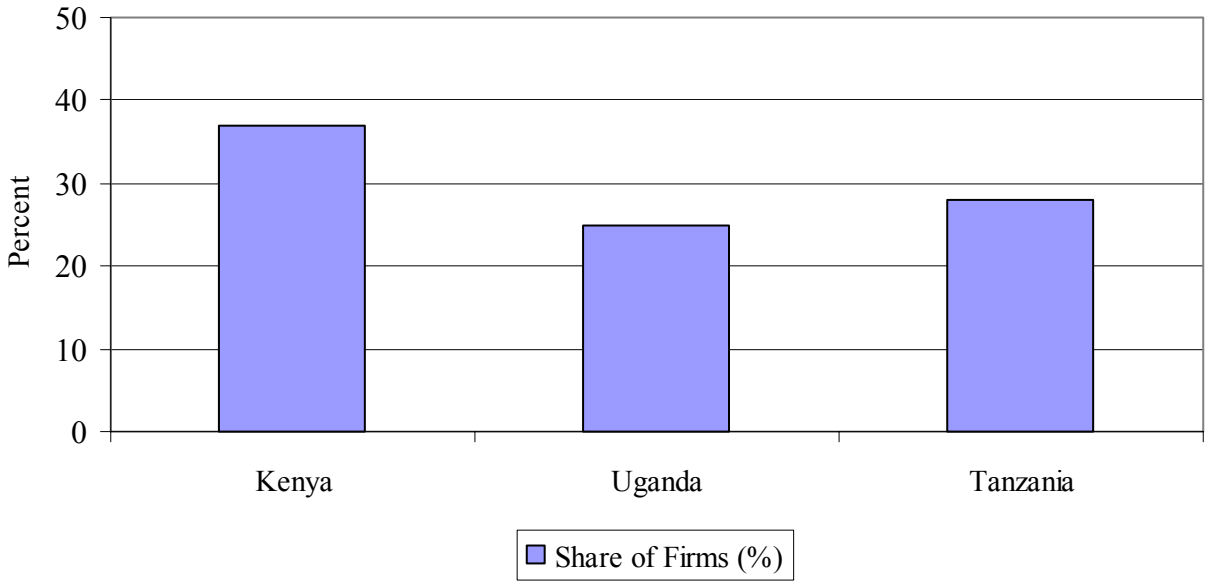
Figure 4.3: Share of Firms Belonging to a Business Association (%)



Source: World Bank (2002/03), Investment Climate Surveys
Kenya (n=282) Uganda (n=180) Tanzania (n=264)

Figure 4.4 shows that a larger share of firms in Kenya consider business associations to be useful in resolving disputes. Associations carry out this role least in Uganda. This evidence supports the hypothesis: courts are least efficient in Kenya and most efficient in Uganda. It appears that associations can complement an inefficient court system as a mechanism for dispute resolution.

Figure 4.4: Share of Firms Rating Associations as Useful in Resolving Disputes(%)



Source: World Bank (2002/03), Investment Climate Surveys
Kenya (n=210) Uganda (n=141) Tanzania (n=123)

Hypothesis 3: The availability of collateral has a negative effect on the likelihood that firms use trade credit.

Hypothesis 3 is tested by estimating a probit model. The dependant variable is the probability that a firm uses trade credit. There is no data on the amount of trade credit. Moreover this indicator is likely to suffer from the same problems described for the amount of bank loan in chapter 2. Hence, the dependent variable is given by equation (1):

Use Trade Credit = 1 (1)
Do Not Use Trade Credit = 0

Table 4.1 shows that most firms in Kenya use trade credit. The use of trade credit is substantially less in Uganda and Tanzania.

Table 4.1: Firms with Trade Credit

	Kenya	**Uganda**	**Tanzania**
Trade Credit	225 (91%)	178 (60%)	169 (62%)
No Trade Credit	22 (9%)	121 (40%)	103 (38%)
Total	247	299	272

Source: World Bank (2002/03), Investment Climate Surveys

The explanatory variables are:

Collateral ownership: Collateral can have a positive or negative impact on trade credit use. A negative impact can be registered if trade credit and bank finance are substitutes. In this case collateral allows firms better access to bank finance, which reduces their demand for trade credit. On the other hand if trade credit and bank finance are complements then collateral will have a positive impact on trade credit use. Firms with better access to bank finance through collateral will also make more use of trade credit. Collateral is measured using the replacement value of machinery and equipment. This is because unlike the replacement value of real estate, this variable was found to have a significant positive effect on access to bank loans for Uganda and Tanzania in chapter 3.

Access to bank loans: Loans can serve as substitutes for trade credit with respect to the working capital needs of firms. At the same time, bank loans and trade credit can be complementary. Having a loan may signal to the suppliers of trade credit that the firm has a low credit risk. Also, if a credit history is required to obtain trade credit then firms with loans are in a better position. This means that the effect of having a bank loan is ambiguous.

Firm age: Older firms are assumed to have stronger links with their suppliers and to have greater reputation. This is expected to give them better access to trade credit. However, older firms may have better access to internal sources of finance and hence use trade credit less. Thus firm age also has an ambiguous effect.

Firm size: Larger firms are likely to have more established links with suppliers and greater market power allowing them greater access to trade credit. On the other hand, like older firms, larger firms may also have better access to internal sources of finance. Moreover, chapter 3 showed that larger firms have better access to bank finance. Size also carries an ambiguous effect.

Profitability: More profitable firms are in a better position to secure trade credit because the likelihood that they will repay is higher relative to less profitable firms. However, profitable firms are likely to have less need for trade credit. The effect of profitability is also ambiguous[26].

Local ownership: Locally owned firms may enjoy stronger network effects with their suppliers compared to foreign owned firms. These firms are expected to have greater usage of trade credit.

Ethnicity: Empirical evidence on Africa shows that Black entrepreneurs are less likely to secure trade credit relative to entrepreneurs from other race groups.

Financial records: Whether or not firms have their financial records audited by an outside agency is expected to have a positive impact on access to trade credit by improving information available to the supplier.

Education: It is expected that more educated entrepreneurs are in a better position to make a case for trade credit.

Region: Regions with a higher level of business activity are likely to be characterized by greater use of trade credit. On the other hand firms in these regions are likely to have the greatest access to bank finance and may therefore require less trade credit. The main industrial regions in Kenya, Uganda and Tanzania are Nairobi, Central and Dar-es-Salaam, respectively.

Industry Differences: Industry dummies are included to account for any unobservable differences across industries. For example network effects may be stronger in some sectors, while intermediate goods may serve better as collateral in others.

Following from the discussion above, the author estimates equation (2):

$$\Pr(\text{Use Trade Credit}) = F(RVA, L, A, E, PROF, AA, LO, AFR, EDU, I) \quad (2)$$

Where RVA, L, A, E, PROF, AA, P, LO, AFR, EDU, I are the replacement value of machinery and equipment, access to bank loans, firm age, employment, profitability, audited accounts, local ownership, African entrepreneur, education level, and industry dummies respectively.

[26] Although profitability was only included as a robustness check in chapter 3 due to data limitations, in this chapter we include it from the start. This is mainly because we have fewer explanatory variables in this chapter compared to chapter 3.

The probit estimation is done for only Uganda and Tanzania. There are several reasons for focusing on these two countries. The argument that trade credit can alleviate credit constraints caused by inadequate collateral requires that the discussion focuses attention on those countries where collateral constraints actually exist. Chapters 2 and 3 showed that collateral constraints are present in Uganda and Tanzania, but not in Kenya. Secondly, a very large proportion of Kenyan firms have access to trade credit. It is Uganda and Tanzania that would benefit from a significant increase in the availability of this source of finance.

Thirdly, Uganda and Tanzania have far less access to short term bank finance (i.e. overdraft facilities) compared to Kenya. Better access to trade credit in these 2 countries can significantly improve the ability of firms to meet their working capital requirements. Fourthly, only in these 2 countries was collateral important for access to bank finance. This implies that collateral will only be important in these 2 countries for the firm's decision over whether to obtain bank finance or trade credit. Finally, given the large proportion of Kenyan firms that have access to trade credit the model is likely to have very low explanatory power for this country. The analysis shows that the estimation would be based on 89 nonzero outcomes and only 10 zero outcomes. More meaningful results would be obtainable if a larger sample size was available. The results of the estimation are given in Table 4.2 below. Like in chapter 3, the estimation obtains the Huber-White robust estimator.

The effect of collateral on access to trade credit differs strongly between the 2 countries. In Tanzania collateral has a negative significant effect. In contrast, collateral has a positive significant effect on access to trade credit in Uganda. This means that for Tanzanian firms trade credit does alleviate the problem of inadequate collateral for firms with demand for bank finance. Thus, trade credit can serve as a substitute for bank loans. However, for Ugandan firms collateral appears to enhance not only access to bank finance, but trade credit as well[27]. The high level of information asymmetry in Uganda (see chapter 2 and 3) may be part of the reason for this. Also recall from chapter 2 that Uganda was found to have the lowest enforcement costs for overdue debt. This would encourage the use of collateral in trade credit arrangements. It also suggests that trade credit and bank finance are complementary in Uganda.

[27] This is a surprising result because the literature has not shown that firms ask for collateral when they extend trade credit.

Table 4.2: Explaining Access to Trade Credit in Uganda and Tanzania.

	Uganda	Tanzania
Log of Replacement Value of Assets	0.214*	-0.167*
	(1.88)	(-1.89)
Bank Loan	0.783**	-0.288
	(2.08)	(-0.71)
Log Firm Age	-0.180	-0.163
	(-0.83)	(-1.03)
Log Employment	0.146	0.508***
	(0.67)	(3.20)
Profitability	-0.011	-0.008
	(-1.06)	(-0.66)
Accounts Audited	0.241	0.256
	(0.55)	(0.62)
Local Ownership	-0.392	0.857
	(-0.73)	(1.51)
African Owner	0.362	-0.035
	(0.76)	(-0.11)
Education level of Manager	0.127	0.263
	(0.33)	(0.77)
Region	-0.544*	0.477
	(-1.65)	(1.56)
Agroindustry	0.297	-0.298
	(0.42)	(-0.66)
Metal	0.927	-0.209
	(1.06)	(-0.40)
Furniture and Wood	0.851	-0.236
	(1.16)	(-0.46)
Chemicals	-0.069	0.723
	(-0.08)	(1.08)
Construction Materials	0.123	-0.041
	(0.16)	(-0.06)
Paper, Printing & Publishing	0.923	0.815
	(1.07)	(1.01)
Constant	-3.828**	1.821
	(-2.01)	(1.30)
Number of Observations	112	118
Log-Likelihood	-55.84	-60.09
Wald – χ^2	45.13***	29.17***
Pseudo R^2	0.25	0.21

Dependent variable: Probability that a firm uses trade credit.
** and *** indicate significance at 5 percent and 1 percent respectively. Numbers in parentheses are z statistics. For the model to be properly identified the plastics industry dummy is dropped for both countries. The identification problem was explained in detail in chapter 3.

Access to bank loans significantly increases the likelihood that firms use trade credit in Uganda. That is, trade credit and bank finance are strong complements (the complementarity is consistent with the positive impact of collateral on trade credit use). This implies that having bank finance sends a positive signal to the providers of trade credit. In an environment where information asymmetry is acute as is the case in Uganda, a credit history with banks appears to improve access to trade credit. In contrast, having a bank loan has a negative insignificant effect on trade

credit use in the case of Tanzania. This lends further support to the view that bank loans and trade credit are substitutes to some extent in Tanzania.

Older firms in both countries are less likely to use trade credit. For both countries firm age has an insignificant effect. Larger firms are more likely to use trade credit. In Tanzania the effect of size is significant at the 1 percent level, while it is insignificant for Uganda. It may be that size proxies for reputation as argued by Isaksson (2002b). This implies that trade credit may not be a very effective solution to the financing needs of smaller firms, particularly in the case of Tanzania.

Having audited financial accounts has a positive effect on trade credit access in both countries, although this effect is insignificant. In chapter 3 it was found that having audited accounts does not significantly affect access to bank finance. In order for financial information to have a meaningful effect on access to external finance, it may require an improvement in its quality.

Whether the firm is locally owned has a positive insignificant effect on the probability that firms use trade credit in Tanzania. In Uganda being locally owned has a negative insignificant effect. Being African improves access to trade credit in Uganda, but has a negative impact for Tanzania. However for both countries the effect of this variable is insignificant. This means that network effects based on ownership structure and ethnicity are weak. The level of education attained by the firm's manager has a positive insignificant effect in both countries. In the case of Uganda being in central region has a significant negative effect on trade credit use. This suggests that firms in this region may have better access to bank finance relative to firms in other regions. In contrast being in Dar-es-Salaam has a positive insignificant effect. There is no evidence to suggest that being in a particular industry is critically important for whether or not firms use trade credit.

As in chapter 3, the discussion of marginal probability elasticities and marginal effects is based on variables found to be significant in the probit estimation. These are marked with an asterisk in Table 4.3. Uganda has 3 significant variables, namely collateral, access to bank loans and geographical region. Table 4.3 shows that a 1 percent increase in the value of collateral increases the probability of having trade credit by 0.08 percent. Having a bank loan increases the likelihood of using trade credit by a fairly large magnitude of 25 percent. Thus, the complementarity of bank finance and trade credit appears to be quite strong in Uganda. Being in

the central region has a large effect on reducing the probability of using trade credit. In Tanzania a 1 percent increase in the value of collateral reduces the probability of using trade credit by 0.06 percent and a 1 percent increase in size raises the probability of using trade credit substantially, by 0.18 percent.

Table 4.3: Marginal Probability Elasticities and Marginal Effects (Trade Credit Use).

	Uganda	Tanzania
Marginal Probability Elasticity		
Log of Replacement Value of Assets	0.078*	-0.058*
Log Firm Age	-0.065	-0.057
Log Employment	0.053	0.177*
Profitability	-0.004	-0.003
Marginal Effect		
Bank Loan	0.250*	-0.105
Accounts Audited	0.088	0.092
Local Ownership	-0.134	0.229
African Owner	0.135	-0.012
Education level of Manager	0.046	0.092
Region	-0.185*	0.158
Agroindustry	0.106	-0.106
Metal	0.258	-0.076
Furniture and Wood	0.265	-0.085
Chemicals	-0.025	0.207
Construction Materials	0.043	-0.014
Paper, Printing & Publishing	0.256	0.225

Marginal probability elasticity is the derivative of the dependent variable with respect to a continuous explanatory variable while holding the other variables constant. Marginal effect is the change in the dependent variable associated with a discrete change in a dummy variable from 0 to 1.

Effect of the Legal Environment on Trade Credit Supply

The willingness of firms to supply trade credit is expected to increase if they have a positive view about the quality of the legal system. They will be more likely to extend trade credit if they expect to recover overdue payments through the courts in an efficient manner. On the other hand, if firms feel they are unable to effectively recover overdue payments through the courts, they will provide less credit. This argument leads us to the next hypothesis:

Hypothesis 4: Trade credit supply increases with the efficiency of the court system.

Hypothesis 4 is tested using a probit model. The dependant variable is whether or not the firm sells some of its goods on credit as given by equation (3).

Sell Goods on Credit = 1 (3)
Do Not Sell Goods on Credit = 0

Firm perceptions about the judiciary are used to proxy for the quality of the legal environment. Firms were asked the extent to which they felt the judiciary would enforce their property rights in business related disputes. Responses ranged from 1 (fully disagree that judiciary will enforce) to 6 (fully agree that judiciary will enforce). A binary variable that takes a value of 1 for firms that have confidence in the judiciary and 0 otherwise is constructed. The expectation is that firms which have greater confidence in the judiciary will supply more trade credit. With the exception of whether or not a firm has its accounts audited and profitability, all explanatory variables from the estimation presented in Table 4.2 are retained[28].

The rationale for the other explanatory variables included in the model is as follows: Firms with bank loans are in a better position to provide trade credit according to the 'redistribution view'. Older firms have stronger networks and are thus better positioned to provide credit. Larger firms are likely to have more financial resources available for lending to other firms. Due to network effects locally owned firms may supply more trade credit. However, these firms may have fewer resources than foreign firms. Similarly, African owned firms may wish to provide trade credit due to network effects but may be constrained from doing so due to inadequate resources. The education level of management will impact a firm's ability to assess the viability of a potential trade credit recipient. This variable refers to whether or not the firm's top manager has had post-secondary school education. Regions with a higher level of business activity are likely to be characterized by greater trade credit supply. Finally, firms in some industries may be better positioned to supply trade credit. The results are presented in Table 4.4.

Confidence in the judiciary has a highly significant positive effect on trade credit supply in Uganda. This is similar to the findings of Johnson et al (2002a) and supportive of hypothesis 4. In chapter 2 it was found that Uganda has the least costly court enforcement. Ugandan firms can have confidence in the judiciary because in practice recovering overdue debt is less costly than in the other EAC countries. This provides an incentive to increase the supply of trade credit. However, for Tanzania one observes an unexpected negative (insignificant) effect. This is surprising, implying that firms that rely less on the court system are more likely to supply trade credit. It is nevertheless consistent with the relatively small share of Tanzanian firms that use

[28] Although profitability may affect a firms ability to supply trade credit it is excluded from the model because of the underidentification problem.

courts to resolve disputes observed in Figure 4.2. Informal means of resolving disputes may be more effective in Tanzania. This result may also be due to data problems.

Table 4.4: Explaining Trade Credit Supply in Uganda and Tanzania.

	Uganda	Tanzania
Confidence in the Judiciary	0.601***	-0.326
	(2.91)	(-1.03)
Bank Loan	0.017	0.684*
	(0.07)	(1.67)
Log Firm Age	0.062	-0.008
	(0.46)	(-0.06)
Log Employment	0.094	0.174
	(0.83)	(1.56)
Local Ownership	-0.545*	0.383
	(-1.68)	(0.76)
African Owner	0.015	0.063
	(0.05)	(0.23)
Education level of Manager	0.420*	-0.072
	(1.66)	(-0.26)
Region	-0.057	-0.059
	(-0.27)	(-0.24)
Agroindustry	-1.045**	0.274
	(-2.23)	(0.65)
Metal	-0.329	0.862*
	(-0.58)	(1.72)
Furniture and Wood	-0.601	-0.236
	(-1.24)	(-0.54)
Chemicals	-	0.233
	-	(0.48)
Construction Materials	-1.173**	0.126
	(-2.24)	(0.19)
Plastics	-0.248	-
	(0.32)	-
Paper, Printing & Publishing	0.067	-
	(0.11)	-
Constant	0.803	0.000
	(1.16)	(0.00)
Number of Observations	209	159
Log-Likelihood	-118.94	-78.91
Wald $-\chi^2$	39.10***	19.98*
Pseudo R^2	0.14	0.10

Dependent variable: Probability that a firm supplies trade credit.
** and *** indicate significance at 5 percent and 1 percent respectively. Numbers in parentheses are z statistics. For the model to be properly identified the chemicals industry dummy is dropped for Uganda, while the plastics and paper industry dummies are dropped for Tanzania.

Firms with bank loans are more likely to extend trade credit in both countries. This effect is only significant in Tanzania, at the 10 percent level. It implies that the 'redistribution effect' is present to some extent. If firms are redistributing bank finance as trade credit, then the benefits to improving the legal environment are enhanced. This is because a better legal system improves

the likelihood that firms unable to secure bank finance directly receive it indirectly as trade credit.

Size and age are insignificant in both countries. Locally owned firms supply significantly less trade credit in Uganda. This is a surprising result which is contrary to the assertion of network effects. Local ownership has a positive insignificant effect in Tanzania. In both countries being African does not have a meaningful effect on trade credit supply. This finding suggests that network effects based on ethnicity are weak in these 2 countries. Educational attainment of management has a positive significant effect in Uganda, but is insignificant in Tanzania. This suggests that educated managers in Uganda are better at identifying profitable opportunities in other firms. Operating in the main business region has a negative insignificant effect on trade credit supply in both countries. Finally, being in the agro and construction industries in Uganda has a significant negative effect on whether or not a firm supplies trade credit, while being in the metal industry in Tanzania has a positive effect.

Table 4.5 shows the marginal effects of the explanatory variables. As before, the focus of the discussion is on variables found to have a significant effect on the dependent variable. These are marked with an asterisk.

Table 4.5: Marginal Effects (Trade Credit Supply).

	Uganda	Tanzania
Marginal Effect		
Confidence in Judiciary	0.212*	-0.102
Bank Loan	0.006	0.160*
Local Ownership	0.180*	0.096
Education level of Manager	0.150*	-0.021
Region	-0.021	-0.017
Agroindustry	-0.382*	0.076
Metal	-0.127	0.184*
Furniture	-0.231	-0.071
Chemicals	-	0.062
Construction Materials	-0.440*	0.035
Plastics	-0.095	-
Paper	0.025	-

Marginal effect is the change in the dependent variable associated with a discrete change in a dummy variable from 0 to 1.

Ugandan firms that have confidence in the judiciary are 21 percent more likely to supply trade credit. This lends strong support to the view that an efficient court system enhances the availability of external finance. Locally owned firms are 18 percent less likely to extend trade credit and the

probability that managers with post-secondary education supply trade credit is 15 percent higher than for their counterparts. Industry effects are large: firms in the agro and construction industries are 38 percent and 44 percent less likely to provide trade credit respectively. In Tanzania firms with bank loans are 16 percent more likely to supply trade credit. The implication of this is that the 'redistribution effect' is at work in Tanzania. Being in the metal industry is associated with an 18 percent higher likelihood of providing trade credit.

4.4 Leasing Finance

In this section attention is turned to leasing finance. Because the data on leasing is very limited, simple tabular analysis forms the basis of the discussion. To begin, a review of the theoretical literature motivating the use of leasing finance and of relevant empirical works is done.

4.4.1 Literature Review

The use of leasing is motivated as a means of addressing high interest rates and collateral requirements of bank lending (Gallardo, 1999; El-Gamal et al, 2001; Balkenhol and Schutte, 2001). In leasing arrangements the asset being leased serves as collateral because it remains in the ownership of the lessor for the duration of the lease term (Dossani and Kenney, 2002). Thus leasing addresses the problem of inadequate collateral faced by the firm and provides an effective security mechanism for the lessor. In a large number of developing countries where bank credit is not available to small firms, leasing may be the only form of long term financing available to these firms for fixed assets (Bass and Henderson, 2000). According to Havers (1999), leasing is likely to be of special interest to manufacturing firms which have a significant need for capital equipment.

Leasing is based on the premise that profits are generated by asset use rather than asset ownership (Gallardo, 1999). That is, a firm with a positive NPV project should be able to undertake an investment on the strength of the expected cash flows, and should not be hindered by a lack of assets to pledge as collateral. Leasing is more focused on the lessee's ability to generate cash flow from business operations to service lease payments, rather than the need for the lessee to pledge collateral because the lessor-financier retains ownership of the asset during the term of the lease.

According to Westley (2003), leasing alleviates the problem of contract enforcement associated with collateral by providing the lessor with a stronger legal position for equipment seizure and sale, compared to bank lending. This is because the lessor owns the leased equipment and as such no one else can have a legal claim to it. He argues that leasing eliminates the costs, time delays and risks associated with court involvement in enforcing the collateral clause. Furthermore, the owner has more flexibility over what to do with the leased asset once it has been seized because he owns it, in contrast to an asset that belongs to a defaulting borrower.

Similarly, Balkenhol and Schütte (2001) state that because the leased equipment remains the property of the lessor, there are no costs involved in verifying property rights. They also explain that in the event that the lessee is negligent, enforcement and repossession are automatic and do not require court action. This benefit leads Eisfeldt and Rampini (2005) to suggest that leasing may be particularly important in environments where legal enforcement is weak.
El-Gamal et al (2000) argue that leasing reduces the agency problems associated with moral hazard because the cost associated with inspecting the leased object are significantly lower than the cost of monitoring the agents' activities. However, Eisfeldt and Rampini (2005) explain that the separation of ownership and control over the leased equipment can lead to a significant agency problem with respect to its care and handling. This cost needs to be weighed against the benefit of leasing with regard to repossession of the leased item.

Although repossession is straight forward under leasing, Westley (2003) and Bass and Henderson (2000) argue that the legal framework is still important for the effectiveness of leasing contracts. A conducive legal environment can be created through specific leasing laws that define and recognize the rights and obligations of each party in the leasing contract. According to Miceli et al (2001), the agency problems that arise from separating ownership and control of the leased item suggest that an efficiently designed lease contract will include aspects of property law, contract law, or both.

4.4.2 Empirical Evidence on Leasing Finance

Ang and Peterson (1984) empirically investigate the extent to which leasing is a substitute for debt based on a sample of approximately 600 firms. Although theory suggests that leases and debt are substitutes, their evidence indicates that leases and debt are complements. Greater use of debt is associated with greater use of leasing for each year from 1976 to 1981.

Based on a survey of 25 Micro Finance Institutions (MFIs) in Latin America, Westley (2003) find that equipment loans and leases account for on average 20.8 percent of overall loan and lease portfolios. He finds that although equipment lending is well established in Latin America, leasing is still in the early stages of development. Of the 25 MFIs only three were found to have leasing programmes in place.

An appraisal of the Grameen Bank's leasing operations in Bangladesh is presented by Gallardo (1999). The bank leases a wide range of equipment ranging from battery chargers, power looms, sugarcane grinders, and mini transport. The default rate is found to be low; 7.12 percent in terms of number and 1.47 percent in terms of value of lease contracts. In addition there is a high rate of progression from leasing into ownership of equipment.

Havers (1999) presents evidence on equipment leasing by small firms in Pakistan and Tanzania. In both countries leasing is found to have the potential to play an important role in assisting MSEs to purchase equipment that is ordinarily unaffordable. He finds that in Pakistan the Network Leasing Corporation (NLC) has a portfolio of over 1,000 leases having attained 94 percent financial self sufficiency. NLC has greatly benefited from financial support given by World Bank and the Asian Development Bank. In Tanzania, a leasing company for women's small businesses called SELFINA grew its portfolio to about 850 leases in a period of 3 years. However, at the time of Havers' survey financial sustainability appeared to be a major concern for SELFINA.

In the United Kingdom companies that use leasing are more likely to have tax losses, high debt-to-equity ratios, and to be relatively large companies (Lasfer and Levis, 1998). Their results also show that on the whole companies that use leasing are likely to have high fixed capital investment and to be more profitable. Among small firms the decision to lease is determined mainly by growth opportunities. Using data from Compustat, Eisfeldt and Rampini (2005) find that firms in the smallest decile lease over 46 percent of their capital. In contrast, among firms in the largest decile only about 11 percent of equipment is leased. They conclude that leased equipment is particularly significant for small firms.

Kisaame (2003) presents the results of a case study of DFCU Leasing Company in Uganda. He explains that the leasing market in Uganda, of which DFCU leasing controls over 85 percent is still in the embryonic stages. Leasing represents approximately 5 percent of total private sector

credit in Uganda as compared to an average of 14 percent in emerging markets. DFCU Leasing is mainly involved in providing finance lease products to SMEs between the value of US$25,000 and US$250,000. Among the key challenges to the leasing market in Uganda is the absence of a Leasing Act that specifies the rights and obligations of lessors and lessees. Kisaame also argues that improvements to enforcement through the court system would reduce the time and costs associated with legal disputes over leased equipment. In addition there is also need to increase awareness in the market about the benefits of leasing.

Mutesasira et al (2001) find that there is a large unmet demand for leasing among MSEs in Uganda and Tanzania requiring medium term finance in the range of US$1,500 to US$100, 000. Given the preference that banks give to larger corporate clients and the MFI focus on the economically active poor, MSEs find themselves in what is termed 'the missing middle'. Their evidence suggests that MSEs prefer to lease equipment with the ultimate goal of ownership. The transport industry is found to dominate the leasing sector in both countries. They explain this observation on the basis of the cross-cutting nature of the transport sector, and the fact that it is easier to prove ownership of vehicles which have registration books compared to other assets. They also find that due to poor credit history information on entrepreneurs in the MSE sector, leasing institutions tend to demand high deposits and collateral requirements as a means of mitigating risk. Lessors require deposits of up to 30 percent of the cost of the asset in addition to collateral such as real estate and land titles.

4.4.3 Summary of Literature Review on Leasing Finance

According to the theoretical literature leasing finance is able to address the problem of inadequate collateral because the leased item serves as collateral. Leasing also mitigates the problem of contract enforcement because the lessor retains ownership. However in practice information asymmetry can lead to substantial collateral as is the case in Uganda and Tanzania. Furthermore, inadequate legal frameworks characterized by an absence of proper leasing laws and inefficient courts can make the recovery of a leased item very costly for the lessor.

Although some discussion on how the legal environment affects leasing finance in East Africa is presented by Kisaame (2003) and Mutesasira (2001) this is done without reference to any particular indicators of the legal system. In order to deduce more clearly how the legal system

affects leasing finance it is necessary to assess the use of leasing as it relates to particular indicators of the legal system.

4.4.4 Analysis of Leasing Finance

The analysis is based on three hypotheses. The limited data implies that the discussion is very tentative. Accordingly, findings or inferences drawn here should be considered preliminary.

Hypothesis 5: More leasing takes place in an environment where the lessor's rights are better defined.

Rationale: Given that the leased item serves as collateral in a leasing agreement, more clearly defined lessor rights make repossession in the event of non-payment easier. Chapter 2 showed using graphical and tabular presentations, that the correlation between the written law and access to credit appears stronger than the correlation between enforcement costs and access to credit. Thus, hypothesis 5 focuses on the written law rather than enforcement.

Hypothesis 6: Assets that are less specialized are more likely to be leased.

Rationale: It is easier to sell assets that are not specialized in the event of default. It is likely that the factors adversely affecting the performance of a firm in a particular industry are also at work in other firms in the same industry. Shocks are often industry-wide in nature. This means that firms with specialized machinery may not be able to depend on their competitors to provide a secondary market for their goods. At the same time, selling equipment to firms in other industries will involve a large discount because these firms are unable to value the assets accurately and need compensation for the learning costs required for them to be able to utilize the machinery.

Table 4.3 shows the number of firms that undertake leasing in the 3 countries. One observes that leasing is used much less than bank finance. In particular, there is very little leasing of machinery and equipment. One would have expected more leasing of machinery and equipment in Tanzania and Uganda where collateral constraints limit access to bank finance. However, as Mutesasira (2001) points out, leasing in East Africa relies heavily on collateral, thus reducing the

ability of firms to substitute it for bank finance. Leasing of land and buildings is more common, and is significantly higher is Kenya compared to Uganda and Tanzania.

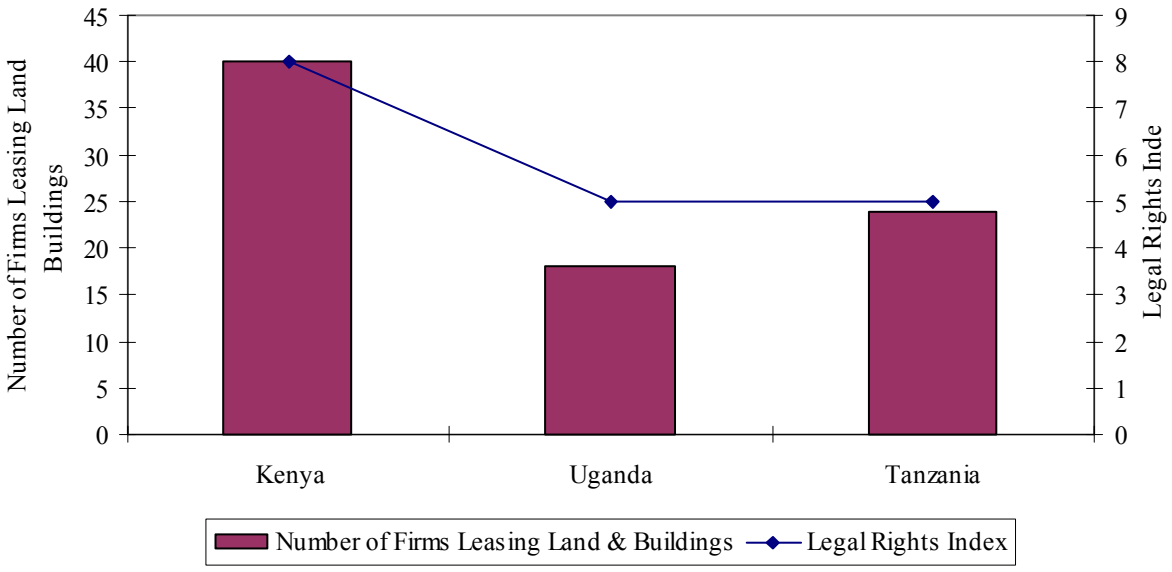
Table 4.3: Number of Firms Leasing Machinery & Equipment and Land & Buildings

	Kenya	Uganda	Tanzania
Machinery & Equipment	5	6	5
Land & Buildings	40	18	24

Source: World Bank (2002/03), Investment Climate Surveys
Kenya (n=248) Uganda (n=289) Tanzania (n=261)

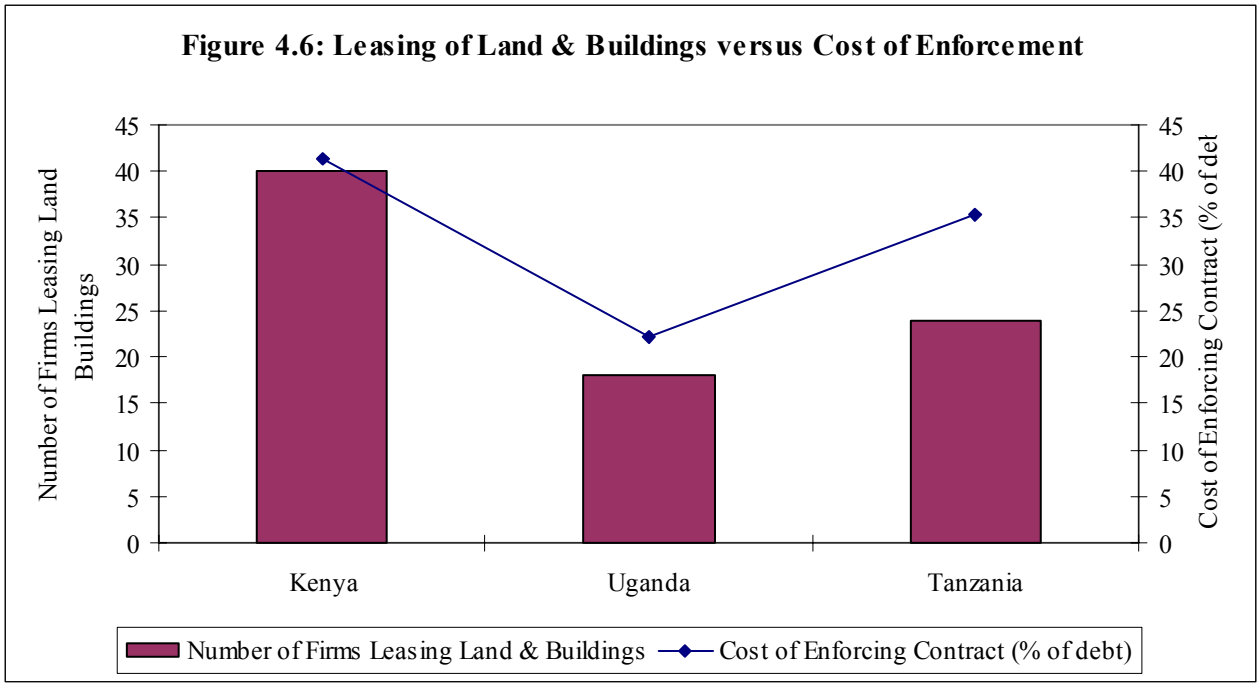
As already stated, the limited data imply that only make tentative statements about hypothesis 4 can be made. Given that the most leasing takes place in Kenya, it appears that better defined lessor rights may promote greater use of leasing finance. This is shown in Figure 4.5.

Figure 4.5: Leasing of Land & Buildings versus Legal Content



Source: World Bank (2002/03), Investment Climate Surveys and World Bank (2005), Doing Business in 2005 Database
Kenya (n=248) Uganda (n=289) Tanzania (n=261)

The amount of leasing has no meaningful correlation with enforcement costs. As Figure 4.6 shows, Kenya has the highest enforcement costs but the most leasing. On the other hand Uganda has the lowest enforcement costs but the least leasing activity. Factors raised in chapters 1 and 2 – the relative size of the Kenyan economy, the higher level of development of the Kenyan financial system and the presence of larger firms in Kenya – are likely to explain this observation.



Source: World Bank (2002/03), Investment Climate Surveys and World Bank (2005), Doing Business in 2005 Database
Kenya (n=248) Uganda (n=289) Tanzania (n=261)

Hypothesis 6 has some support from Table 4.3. More firms lease land and buildings in all 3 countries. These assets are not specialized like machinery and equipment. Furthermore land and buildings tend to appreciate in value over time, whereas machinery and equipment depreciate rapidly in SSA partly because of the thinness of secondary markets.

Hypothesis 7: Better defined legal content will be associated with leasing contracts of longer duration.

Rationale: Leasing firms will be more willing to allow firms to use leased equipment for longer periods in an environment where the rights of lessors are well defined. Better defined lessor rights reduce uncertainty over the leased asset.

Table 4.4 shows that the duration of leasing contracts varies greatly across the 3 countries. Leasing contracts for both land and buildings are longer in Kenya compared to Uganda and Tanzania. In Kenya and Uganda the leasing period for land is much longer than it is for buildings. However in Tanzania the duration is fairly similar for both assets. Overall the duration of leasing contracts is by far shorter in Tanzania than in the other 2 countries.

Table 4.4: Duration of Lease (years)

	Kenya	Uganda	Tanzania
Land	48	25	1.71
Buildings	7.29	2.33	1.3

Source: World Bank (2002/03), Investment Climate Surveys
Kenya (n=248) Uganda (n=289) Tanzania (n=261)

There may be other factors driving what is observed in Table 4.4. For example, it may be the case that the longer duration of leasing contracts in Kenya is a reflection of the market power that the relatively larger firms in that country command. Nevertheless, Table 4.4 does support the hypothesis that better quality legal content is associated with leasing contracts of longer duration. Based on the evidence in chapter 2 about the superior legal content found in Kenya, it is plausible to assume that the legal rights over land and buildings are more clearly defined in Kenya compared to Uganda and Tanzania. Leases of longer duration may give firms a greater sense of security and therefore have a positive impact on productivity. It is also possible that firms in Uganda and Tanzania are likely to have greater transactions costs associated with more frequent renewal of current leases or signing new ones. This could discourage leasing by firms in these countries.

4.5 Conclusions

Although trade credit does not depend on the collateral mechanism, courts are important in resolving payment disputes between buyers and their suppliers. Where court enforcement is costly business associations can be useful in settling these disputes. Furthermore, non-bank sources of finance are expected to meet the financing needs of firms that are unable to meet the collateral requirements of banks. In a weak legal environment the collateral mechanism becomes more costly and thus non-bank sources of finance have a potentially critical role to play. This chapter attempted to empirically analyze the relationship between the legal system on one hand, and trade credit and leasing finance on the other. To the best knowledge of the author this is the first attempt to do so at the micro level for a group of SSA countries.

It was found that high enforcement costs do not deter the use of courts to settle disputes associated with trade credit. Rather, the demand for court services to settle disputes increases with the quality of the written law. The observation that courts in Kenya take a significantly longer period to settle disputes may be a result of this higher demand compared to Uganda and Tanzania. Faster resolution of disputes in Uganda and Tanzania may mask the fact that there is

significantly less to enforce in these countries. Furthermore, courts are likely to be a more effective deterrent to opportunistic behaviour relative to non-court mechanisms. Tanzania which has the least use of courts was also found to have the greatest share of sales resulting in overdue payments. In contrast, Uganda which has the most efficient court system among the 3 countries has the least problems with overdue payments. Thus, courts appear to be an effective deterrent to opportunistic behaviour when they function efficiently. The analysis also showed that business associations can play a role in resolving disputes over trade credit. These associations are of greater value when the court mechanism is more costly. The strengthening of business associations as a complementary mechanism through which disputes are resolved can have a positive effect on the availability of trade credit.

The chapter investigated the impact of collateral on trade credit use in Uganda and Tanzania with a probit model. The results indicate that having collateral has a significant positive effect on the use of trade credit in Uganda. This implies that trade credit may not be a meaningful substitute for bank finance in the case of firms with inadequate collateral in Uganda. This is in contrast with the arguments of among others, Fafchamps (1997) and Gallardo (1997), who argue that trade credit alleviates the problem of inadequate collateral. Rather, it appears that trade credit and bank finance in Uganda are complements as it was found that firms with bank loans are more likely to use trade credit. However, in Tanzania firms with collateral are less likely to use trade credit. This significant negative effect of collateral on trade credit use implies that trade credit has the potential to serve as a meaningful substitute for bank finance.

The results showed that perceived efficiency of the courts has a significant effect on the supply of trade credit in Uganda. Firms that have confidence in the judiciary to enforce their property rights are more likely to provide trade credit. The marginal effect of this confidence was found to be fairly large. It appears that the relatively low enforcement costs in Uganda can act as an incentive for firms to extend trade credit. In contrast, confidence in the judiciary is negatively related to trade credit supply in Tanzania. This surprising finding is consistent with the low share of Tanzanian firms who make use of the courts. The supply of trade credit also appears to be positively affected by access to bank finance, particularly in Tanzania. This supports the 'redistribution view', and shows that strengthening the legal environment can allow firms unable to access bank finance directly, to do so indirectly through trade credit.

This chapter also sought to shed light on how the legal environment affects the use of leasing finance. It was found that the use of leasing finance in the EAC is minimal. Similar to Kisaame (2003), the conclusion of this chapter is that leasing is still in the embryonic stage in the EAC. The limited evidence showed that more leasing takes place in an environment where the rights of lessors are better defined. In addition, there is more leasing of assets that are not industry specific. This is partly because of the difficulties associated with selling specialised equipment, particularly in thin secondary markets. It was found that better quality legal content is associated with leasing contracts of longer duration. These longer contracts may positively affect productivity and could have lower transactions costs relative to shorter ones.

CHAPTER 5: PROPERTY RIGHTS, FINANCE CHANNELS AND INVESTMENT

5.1 Introduction

In the context of SSA, little is known at the micro level about how the legal environment affects the use of financial resources. This is an important gap in the literature given that economic growth is dependant not only on whether firms have access to financial resources, but also on the extent to which firms undertake productive investment opportunities. Chapter 1 highlighted a 2 part transmission mechanism through which the legal system operates. In the first part a good quality legal system improves access to external finance. In the second part the legal environment affects the decision to use financial resources for investment, whether those financial resources are externally or internally generated. This chapter analyzes the second part of the transmission mechanism. That is, this chapter investigates how the property rights environment affects fixed investment.

Available empirical evidence suggests that the rights of firms over the investments they undertake are of significant importance for investment and economic growth (Johnson et al, 2002b; Acemoglu and Johnson, 2005). When property rights are weak, the likelihood that government officials and other powerful groups will expropriate productive assets increases. The same holds for the returns generated by these assets. Less investment will take place when firms are uncertain about their claim to their investment and the returns they generate. Knight (1971: 319) sums up this idea with the following words,

> "The social justification of private ownership is that the coupling of control of resources with enjoyment of the fruits of their use is supposed to give an incentive to use the goods effectively in production."

Internal finance is critical for investment. Although the first part of the transmission mechanism focuses solely on how the legal system affects access to external finance, empirical evidence indicates that investment in both developed and developing countries is financed mainly through internal sources (Rajan and Zingales, 1995). This means that the property rights environment affects investment not only through the external finance channel, but also by influencing decisions that firms make over internally generated funds. Arguably, the property rights environment may influence the use of internally generated funds more than the use of loans:

given moral hazard firms are likely to be more concerned about recovering their own money that repaying a loan.

The arguments forwarded by Acemoglu and Johnson (2005) suggest that the effectiveness of the legal system in protecting the property rights of private agents is compromised by corruption. Similarly, Acemoglu and Verdier (1998) argue that enforcing property rights is only possible when some fraction of public officials do not accept bribes. This indicates that more corruption may lead to weaker property rights. According to Aidt (2003) corruption will be found where the incentives in political, legal and administrative institutions lead to the exploitation of discretionary power for the extraction of rents. Thus, the incidence of corruption is an indicator of the property rights environment. When the incidence of corruption is so high as to significantly affect the government's ability to enforce contracts, investment is likely to be affected. In the context of SSA corruption has been found to be a significant deterrent to investment (Gyimah-Brempong, 2002).

Micro level literature on the relationship between property rights and investment in the context of SSA is limited. It is the aim of this chapter to improve the understanding of this relationship using micro data from the EAC. To the best knowledge of the author this chapter is the first detailed investigation into how property rights affect investment by manufacturing firms in SSA. Compared with other regions SSA has a poor legal environment characterized by high levels of corruption, a weak judiciary and inadequately defined property rights. Although work has been done demonstrating that weak institutions adversely affect investment in Africa (Collier and Gunning, 1999; Mlambo and Oshikoya, 2001), not much is known about the role of specific institutions.

According to Acemoglu and Johnson (2005) much more work is needed to understand how property rights institutions affect investment and economic growth at both the micro and macro level. Furthermore, previous micro level studies that have examined the importance of external finance for investment have not placed much emphasis on the role of the institutional environment. The analysis in this chapter falls under the investment climate approach (see for example Dollar et al, 2005). This approach uses micro level data to investigate the institutional determinants of firm growth, investment, and productivity in developing countries. It is expected that this chapter will add to the growing literature in this emerging area.

5.2 Literature Review

This chapter draws on literature in two main areas. First, investment is motivated on the basis of several theories. These include neoclassical theory, financial explanations which encompass the role of asymmetric information, and the option value approach. The investment climate approach is not a theory in itself, but it does place strong emphasis on institutional issues such as property rights and corruption. Second, the chapter draws on literature that examines the effect of corruption on investment. This is important given the close relationship between corruption and property rights. However, before considering how corruption affects investment, it is useful to also explore what leads to corruption.

5.2.1 Theories of Investment

Neoclassical Determinants of Investment

Neoclassical investment theory assumes that expected demand for real output has a positive effect on investment. Higher investment in response to expectations about future demand is referred to as the accelerator effect. Neoclassical theory also focuses on the cost of capital as a key determinant of investment (Jorgenson, 1963). A firm's desired capital stock is found by equating the marginal product and user cost. Investment is expected to decline in a high interest rate environment. Another variant of neoclassical theory due to Tobin (1969) assumes that the adjustment costs of changing the capital stock are convex. This approach focuses on the ratio of the market value of a unit of capital to its replacement cost, known as Tobin's q.

Financial Determinants of Investment

In a neoclassical framework firms and investors have symmetric information about projects and financial markets function efficiently. In reality however, firms are better informed about the quality of their projects. Investors will not fund every positive NPV project because of the unequal spread of information. Some firms will be unable to pursue productive investment opportunities because of inadequate finance. Financial intermediaries play a unique role of reducing information asymmetry and channeling financial resources to groups without access to internal finance (Diamond, 1984, 1991; Boyd and Prescott, 1986). Furthermore, financial intermediaries direct financial resources to high return projects (Levine and Zervos, 1998; Levine et al, 2000). In the context of developing countries where information problems are acute,

improved financial information can have a meaningful impact on investment. As a result of their specialized role, financial intermediaries (banks in particular) supply the bulk of external finance that firms use for investment (Gorton and Winton, 2003).

Although financial intermediaries are able to alleviate information asymmetry, in reality the bulk of finance for investment is generated internally (see for example Mayer, 1990). The large costs associated with alleviating adverse selection and moral hazard can be avoided by relying on retained earnings to finance investment. To this end, Myers and Majluf (1984) show that firms have a pecking order of financing whereby internal sources are the most preferred source of finance, followed by debt, and finally when a firm exhausts its debt capacity it resorts to equity. In their model investors in stocks are unable to distinguish between good and bad opportunities. This implies that investors will discount the price they are willing to pay for good shares. As a result companies with good prospects do not issue shares, as it implies settling for an undervaluation of their stock. Other authors who have used the asymmetric information framework to show the relevance of internal finance for fixed investments include Bernanke and Gertler (1990), and Calomiris and Hubbard (1990). The implication of asymmetric information is that firms with greater cash flow will be better positioned to pursue investment.

Policy Determinants of Investment

Government policies can have a positive or negative effect on investment. Crowding out of domestic investment occurs when increased government consumption raises interest rates, which reduces the pool of profitable projects (Keynes, 1937). Higher government spending financed by borrowing from the domestic financial sector also reduces the amount of funds available for lending to the private sector. Governments in developing countries have a record of imposing strong regulations on the financial sector. This is partly a way of ensuring financial institutions give the public sector preference over private agents with respect to borrowing of funds. On the other hand, government spending can crowd in private investment (see Blejer and Khan, 1984) if it improves infrastructure or stimulates demand. In developing countries where infrastructure is relatively poor, the crowding in effect can have a significant role to play in stimulating economic activity.

Option Value Approach to Investment

In the last two decades an alternative view of investment called the option value approach has emerged. A comprehensive discussion of this approach is provided by Dixit and Pindyk (1994) and Abel et al (1996). The option value approach emphasizes three key features that were not explored in previous literature. First, investment in fixed capital is partly or completely irreversible. The initial cost of investment is to some degree sunk because it cannot be fully recovered by selling the capital in secondary markets. Second, there is uncertainty about the future returns of investment decisions. Investors can at best attach probabilities to output and capital prices, and future interest rates. Finally, the decision to invest can be delayed giving the firm an opportunity to acquire more information about uncertain variables. The optimal investment decision balances the value of exercising the option to wait for new information with the cost of postponing investment measured in terms of foregone returns.

The Investment Climate Approach

According to Smith and Hallward-Driemeier (2005) one of the new frontiers of economics is the analysis of growth from a microeconomic standpoint. This places firms as the engine of growth rather than the aggregate measures of macroeconomics. Dollar et al (2005) define the investment climate as the institutional, policy, and regulatory environment in which firms operate. It is the factors that determine how much reaping will follow the sowing process. They explain that the idea of the investment climate has a strong link to what the macroeconomic literature refers to as high quality institutions.

The investment climate also includes the physical infrastructure, geographic features, and human resources which influence the efficiency of firms (Eifert et al, 2005). Similarly, Phillips (2006) states that the investment climate has two components. These are governance and infrastructure. Governance refers to characteristics such as corruption and the quality of the judicial system. Infrastructure refers to hard infrastructure (for example roads and bridges) and soft infrastructure (for example telephone and internet facilities).

A key contribution of this approach is the evidence it provides on how institutions actually influence firm behaviour. The investment climate approach is not a theory in itself, but rather

provides a useful tool for directly testing the key determinants of firm performance at the micro level.

5.2.2 Causes of Corruption

The definition of corruption in chapter 1 shows that the prevalence of corrupt practices hinges strongly on the opportunistic behaviour of public officials. Why do these officials choose to misuse their positions for private gain? In this section some of the theoretical reasons behind corruption are reviewed. This gives context to the measures of corruption that will be used in the empirical analysis. These measures are based on the individual experience of firms with corrupt public officials. Furthermore, because corruption directly affects the quality of property rights, an examination of its causes is beneficial to the study.

The Institutional Environment – It was stated in the introduction that corruption is to a large extent a result of the poor quality of institutions that facilitate economic activity. For example, Treisman (2000) explains that corruption will be more prevalent in countries with weak legal systems. He states that the probability that public officials will be caught and punished increases with the quality of the legal system. Where strong protection and opportunities for recourse are offered to private agents affected by corrupt acts, less corruption will take place. Another aspect of the institutional environment mentioned by Bardhan (1997) is the design of the permit and license system. The more elaborate this system is, the more opportunities public officials have to abuse their positions for personal benefit.

Enhancement of Efficiency – This view is closely related to the institutional motivation for corruption. If the institutional framework is poor, corruption is viewed by some as a means of enhancing efficiency (Leff, 1964; Shleifer and Vishny, 1994). According to this view corruption allows private agents to bypass poorly designed government policies and red tape. It is considered to be a rational response to government failures. These arguments are presented formally in the 'queue model' of Lui (1985). In this model a bureaucrat is responsible for allocating licenses to individuals that queue to obtain them. The individuals have an aversion to queuing. This aversion varies across individuals but is unobserved by the bureaucrat. Licenses are allocated on the principle that those who are willing and able to pay a high bribe are served first. Bribes show the value individuals place on not queuing, and the bureaucrat gives preference to those who desire to have fast service.

However, According to Aidt (2003) several factors make efficient corruption an unsatisfactory framework for analysis. It is difficult to justify that corruption actually enhances efficiency. Corrupt transactions are secret and thus have no characteristics of a competitive bid. Moreover, efficiency is unlikely to be attained given the use to which revenues obtained through corruption are put to. Revenues end up in the pockets of public officials rather than being used or the provision of public services or to address distortionary taxes. While the arguments of Aidt are valid, corruption as analyzed by Liu can potentially enhance the speed of doing business and consequently the ability of firms to undertake profitable investment opportunities.

Poor Remuneration – It has also been argued that corruption is a result of low salaries earned by public officials. This rationale for corruption is based on the role of efficiency wages as a punishment or enforcement mechanism (Becker, 1968; Becker and Stigler, 1974). Relative to wages earned by workers in the private sector public officials are poorly compensated. Rijckeghem and Weder (1997) explain that low salaries force public officials to engage in corrupt practices as a means of supplementing their income. On the other hand, higher salaries can deter corruption because getting caught and punished implies substantial loss. Part of the challenge of addressing corruption in this context is that corruption may be viewed as a sustainable income source, and hence its root cause (low salaries), remain unchanged.

Acemoglu and Verdier (1998) develop a model explaining the inter-relationship between property right enforcement and corruption. In their model contracts are incomplete and thus government must actively undertake enforcement if private agents are to confidently pursue investments based on contractual agreements. Government employees are paid efficiency wages to reduce the incentive for them to engage in corrupt practices. However, such high wages are costly. They find that too much corruption tends to destroy property rights incentives, but preventing all corruption is likely to be too costly. Moreover, public sector workers tend to be 'misallocated talent' because the rents they seek attract agents with no comparative advantage in the sector. In their analysis it may be optimal to allow some corruption and not enforce property rights fully.

5.2.3 Empirical Evidence on Investment, Corruption and Property Rights

Macro Evidence

Earlier empirical studies on SSA examined investment from a macroeconomic perspective. They were conducted mainly in the form of single country time series studies. For example Ghura (1999) finds that in Cameroon the effect of private investment on economic growth for the period 1963-96 was highly significant. In the case of Zimbabwe, Jenkins (1998) finds that investment is significantly constrained by inadequate finance and external debt. Macroeconomic data has also been used to undertake cross country studies (for example Kumar and Mlambo, 1995; Hadjimichael and Ghura, 1995; Mlambo and Oshikoya, 2001). These studies indicate macroeconomic factors such as inflation, fiscal policy, the exchange rate, and uncertainty about the policy environment significantly affect aggregate investment levels in SSA.

Ndikumana (2000) builds on the time series and cross sectional studies by analyzing a panel of 30 SSA countries for the period 1970-95. He examines the relationship between four indicators of financial development and private investment. His results show that financial development has a significant positive effect on private investment. Growth in per capita GDP also has a positive effect on investment in accordance with the accelerator effect. He also finds that the debt stock, the black market premium, and inflation have a negative impact on investment. Using a similar approach for a sample of 99 developed and developing countries Ndikumana (2005) also finds that financial development positively affects domestic investment. The accelerator effect is again found to be present for this larger group of countries. Although panel estimation is a notable improvement over cross sectional and time series studies, Ndikumana concedes that it still leaves questions that cannot be answered with aggregate data. For example, it may be interesting to examine how investment behaviour differs between small and large firms, or across different sectors.

Gyimah-Brempong and Traynor (1999) examine how political instability affects growth and investment for a group of 39 African countries. They define political instability as situations, activities or patterns of political behaviour that threaten to change or actually change the political system in a non-constitutional way. Their results show that political instability has a significant negative effect on economic growth and capital accumulation. The negative effect on investment holds for the current period and inter-temporally.

Attempts to empirically measure the effects of corruption on investment have largely been in the form of cross-country studies. Mauro (1995) presents the first examination of how corruption impacts investment using a sample of 67 countries. He utilizes a corruption index provided by Business International (BI) and finds that corruption has a significant negative effect on the ratio of private investment to GDP. Keefer and Knack (1995) find concurring results when they include corruption with other explanatory variables to form a single index of institutional quality. With an expanded sample of 94 countries and using a newer corruption measure provided by the Political Risk Service (PRS), Mauro (1997) provides further support to his earlier results. Similarly Brunetti, Kisunko and Weder (1997) also present cross-country evidence showing that corruption negatively affects the ratio of investment to GDP.

Using panel data on a group of African countries Gyimah-Brempong (2002) investigates the effects of corruption on economic growth. His results show that corruption has a direct and indirect significant negative impact on economic growth in Africa. He finds that a 1 percentage point increase in corruption decreases the growth rate of GDP by between 0.75 and 0.90 percentage points per year and per capita income by between 0.39 and 0.41 percentage points. Results of his accelerator model show that corruption indirectly affects economic growth by significantly reducing investment in physical capital.

The effects of instability and uncertainty on investment in Africa are examined by Serven (1997). He explains that in the context of Africa, uncertainty to a large extent refers to imperfect credibility of policy reforms. A lack of confidence in the policy environment can be seen in a weak and delayed investment response because investors are not confident that reforms will be sustained. Macroeconomic indicators of uncertainty include high inflation rates, large public deficits, and exchange rate overvaluation. Instability refers more to the effects of an unpredictable political climate. Factors affecting the degree of political instability include property rights, ethnic fractionalization, and income inequality. Using cross country data Serven (1997) finds that high inflation and weak property rights are negatively related to aggregate investment in Africa. He concludes that the correction of macroeconomic imbalances and institutional reforms can play an important role in stimulating investment.

Macroeconomic studies have also shown that public sector investment has an important role to play for growth and investment in developing countries. This means that the crowding-in effect is present in these countries. Based on pooled data for a group of 24 developing countries, Blejer

and Khan (1984) find that the trend component of real public sector investment has a positive effect on private investment. They state that this is consistent with the argument that infrastructural investment complements private investment. These authors also find that the accelerator effect is present in the group of countries they examined.

More recently, Erden and Holcombe (2005) have found evidence showing that public investment complements private investment in a panel of developing countries. They find that on average a 10 percent increase in public investment is associated with a 2 percent increase in private investment. In contrast, their results also show that in developed countries public investment crowds out private investment. Luintel and Mavrotas (2005) examine the determinants of investment for a group of 24 low-income and middle-income countries. They find that countries with higher real income per capita experience more crowding out than countries with lower real per capita income.

With regard to SSA, infrastructure is significantly less than in other developing regions (Collier and Gunning, 1999). They also state that the quality of infrastructure is lower although its price is significantly higher. These views are reiterated by Hernandez-Cata (2000). He states that the cost of private investment in Africa is increased by the poor quality of infrastructure, particularly communications and electric power. He argues that inadequate investment in infrastructure is a result of insufficient budget allocations, fraudulent diversion of public funds, and corrupt management.

Micro Evidence

There is a growing literature using microeconomic data to explain investment in SSA. The earlier firm level studies emphasized the impact of profitability on a firm's investment decision. Bigsten et al (1999) examine manufacturing investment in four African countries. They find that profitability has a significant positive effect on firm investment. Their findings show that although profit rates in African manufacturing are high, investment rates are extremely low (with a median of close to zero). They attribute the low investment primarily to high capital costs. They also state that the high profit rates are consistent with the argument that investment in SSA is constrained by macroeconomic instability. Gunning and Mengistae (2001) also find that profitability is an important determinant of investment in African manufacturing. They argue that

the high rate of return is a result of the risk faced by firms. However their data gave no direct measure of risk that could be used to test this view.

In more recent times the analysis of firm behaviour has been conducted in the framework of what is called the investment climate. Although the Investment Climate Assessment (ICA) surveys have been done for several developing and transition economies, academic research using this framework is still limited. Johnson et al (2002b) examine how property rights affect the share of profits reinvested by a group of 5 Eastern European countries. They measure property rights based on responses to questions about whether firms make unofficial payments for government services, licenses, and specific services such as renewing of business registration and tax inspection. Firms also indicate whether or not courts can enforce contracts. They find that weak property rights discourage investment even when firms have access to bank loans. That is, when property rights are taken into account they find no evidence showing that access to bank finance leads to a higher reinvestment rate. Their results show that entrepreneurs with the most secure property rights invest almost 40 percent more than those with the least secure property rights.

Claessens and Laeven (2003) examine how property rights affect the allocation of investable resources. Their study is based on industry specific data for a group of 44 developed and developing countries. They define property rights as the degree of protection given to the return of assets against powerful competitors. This definition is in contrast to the focus placed on the behaviour of public officials commonly found in the literature. Nevertheless, they find that insecure property rights leads to suboptimal asset allocation and lower growth, particularly in new firms. Their results suggest that this effect is economically as significant as the impact of inadequate finance.

Based on firm level data for a group of 27 African countries McArthur and Teal (2002) empirically examine the impact of corruption on firm performance. They find that corruption has a significant negative effect on firm productivity. They also find that firms operating in economies where bribes are prevalent are on average only a third as productive as firms operating in bribe-free economies. Dollar et al (2005) investigate how the investment climate affects firm performance in Bangladesh, China, Ethiopia and Pakistan. They find that proximity to major markets and access to overdraft facilities have a positive effect on the growth rate of fixed assets. On the other hand, the number of times the business operation is inspected by government departments has a negative effect on the growth rate of fixed assets.

One aspect of investment that has received little attention in the context of SSA is the role of internal finance. This may be as a result of inadequate data. However, empirical studies from based on developed countries have shown that cash flow is an important determinant of investment. These include the pioneering work of Fazzari et al (1988) and Hubbard et al (1993). The findings of these authors suggest that cash flow is more important for firms that are likely to face capital market imperfections. Carpenter and Petersen (2002) and Caggese (2005) show that internal finance is a more serious constraint for small firms. Given the thinness of equity markets, the large share of small firms, and the acuteness of asymmetric information that characterizes countries in SSA, cash flow is likely to be important for investment.

5.2.4 Summary of Literature Review

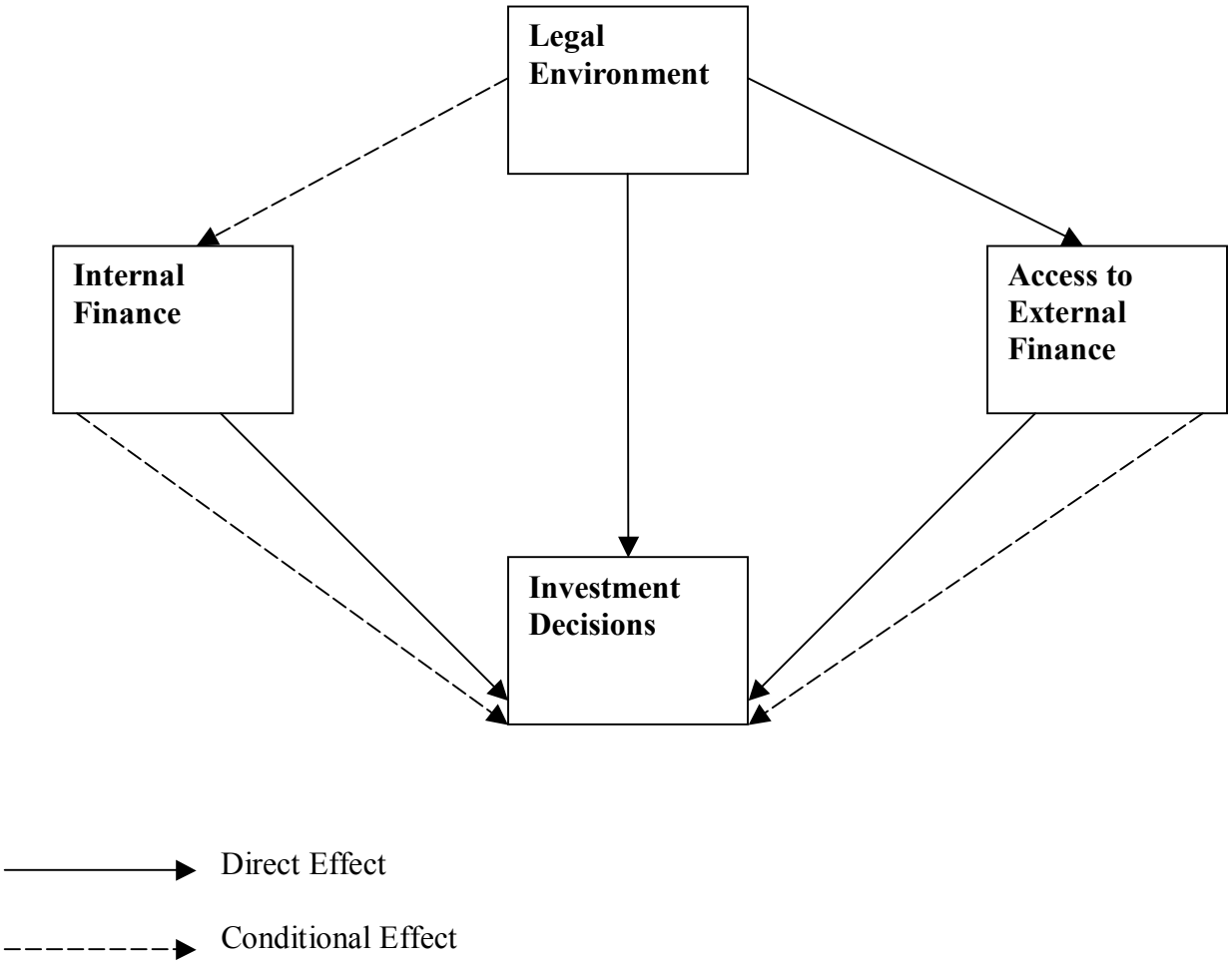
Macroeconomic stability and access to finance are critical for investment in SSA. Expectations about growth in demand are also important for investment. Macro evidence has also shown that weak institutions and poor infrastructure negatively affect investment. Furthermore, the macro evidence shows that corruption negatively impacts on investment. However, analyzing investment at the aggregate level does not adequately explain the incentives that will lead to higher investment rates. Firm level data makes it possible to examine the micro underpinnings of investment in SSA. Earlier micro literature revealed that although profitability in African manufacturing is very high, investment rates are extremely low. Macroeconomic instability and high risk have been forwarded as explanations for this observation. Firm level evidence from developed countries has shown that cash flow is strongly correlated with investment. Due to data limitations such empirical evidence is lacking for SSA. However, the characteristics of firms and financial markets in SSA countries suggest that cash flow will be a significant determinant of whether or not firms can pursue investment opportunities.

More recently the focus at the micro level has turned to the importance of institutional factors for investment and firm performance. Empirical evidence shows that secure property rights have a significant impact on investment in Eastern Europe, and that corruption has a negative effect on productivity in Africa. However, the empirical evidence on Africa based on the investment climate approach is still limited. In particular, given the relative weakness of legal institutions in SSA, examining how property rights affect investment is an important exercise.

5.3 The Transmission Mechanism

Figure 5.1 shows the key relationships that constitute the transmission mechanism in the study. The legal environment can affect firms' ability to invest at 2 stages. First, a better quality legal environment can positively affect the availability of external finance. This dissertation has argued that access to credit is improved under a good quality legal environment as a result of the protection and enforcement of creditor rights. Some supporting evidence was obtained in chapters 2, 3 and 4.

Figure 5.1: Some Key Relationships



At the second stage of the transmission mechanism the legal environment has a conditional effect on investment. Firms have greater confidence to channel both internally and externally generated funds into investments if their property rights are better protected[29].Access to external finance

[29] Note that for the transmission mechanism indicators of conditional effect via internal finance, the broken arrows flow from the legal environment through internal finance to investment. This is so because, unlike external finance, which is largely dependent on creditors' rights (a legal environment factor), internal finance

and the availability of internal finance also have a direct effect on investment. Irrespective of the legal environment, it is anticipated that firms which have access to bank loans and those that have a larger pool of internally generated funds will invest more.

5.4 Measuring Property Rights

The ICA data gives indicators of the property rights environment in the EAC. Firms were asked the extent to which they felt the judiciary would enforce their property rights in business related disputes. Responses ranged from 1 (fully disagree that judiciary will enforce) to 6 (fully agree that judiciary will enforce). Table 5.1 shows that Uganda has the highest share of firms who have confidence in the judiciary to enforce their property rights. Tanzania has by far the lowest share. This is consistent with the finding in chapter 2 that Tanzania has the weakest legal content. This low confidence in the judiciary may reflect the fact that the property rights being enforced are poorly defined to begin with. The socialist history of Tanzania is likely to be a determining factor with regard to how the law treats ownership of property.

Table 5.1: Property Rights in the EAC

	Kenya	**Uganda**	**Tanzania**
Feel judiciary will enforce property rights (%)	22.7	35.5	17.7
Feel corruption is serious obstacle (%)	70.9	35.7	50.0
Make unofficial payments (%)	57.7	66.3	51.1
Share of contract value paid to officials (%)	7.48	3.56	3.86

Source: World Bank (2002/03), Investment Climate Surveys
Kenya (n=269) Uganda (n=282) Tanzania (n=265)

This measure of property rights needs to be interpreted with caution. For example, it may be that there is a higher level of ignorance about the judiciary in Tanzania, or that there is a stronger cultural preference to use informal mechanisms such as direct negotiation. Another factor to consider is that perceptions across countries are not always easy to compare. Firms can have very different benchmarks about what is acceptable for a particular issue (Hallward-Driemeier and Stewart, 2004).

Firms were also asked whether they make unofficial payments to government officials with regard to customs, taxes, licenses, regulations, and services. This indicates the incidence of

is largely a function of firms' operating performance. Thus, it is unaffected by the first phase of the transmission path.

expropriation (and thus the incidence of corruption) by government officials in the three countries. Table 5.1 shows that Uganda has the highest share of firms that make unofficial payments, followed by Kenya.

Corruption is more likely to be perceived as an obstacle to doing business when the payments firms make to government officials are high. In contrast, firms will not consider corruption to be a major problem if it does not significantly diminish the amount of profit they keep from an investment project. Thus, corruption is more likely to be perceived as a problem if firms lose a significant part of their return in the form of bribes to government officials. Table 5.1 shows the share of firms that feel corruption is a major obstacle to the running of their business. One observes that Kenya has by far the largest share of firms negatively affected by corruption. Uganda clearly has the smallest share. The amount firms pay to government officials in Kenya is expected to be significantly higher than in Uganda and Tanzania. This implies that bribes may have a larger effect on investment in Kenya than in Uganda, although the prevalence of unofficial payments is higher in the latter.

Table 5.1 supports the argument that the amount Kenyan firms pay as bribes is higher than in the other countries. Firms were asked to indicate what share of the contract value is paid as unofficial payments when they do business with government and the local council. Table 5.1 shows that Kenyan firms pay a significantly higher share than Ugandan and Tanzanian firms. In absolute terms, the amount that Kenyan firms are paying is also likely to be higher given that these firms are larger than their counterparts in the other 2 countries. This is consistent with the larger share of firms in Kenya who feel corruption is an obstacle.

One can argue that overall Uganda has a better property rights environment compared to Kenya and Tanzania. According to Table 5.1 Uganda has the best score on 3 out of the 4 measures. Table 5.1 also shows that all countries have weaknesses, but that priority for policy may differ. For example, Tanzania may need to place greater emphasis on strengthening rights as defined in the written law compared to the other countries.

Correlations amongst the different property rights indicators are shown in Table 5.2. There are 2 consistent results for all 3 countries. First, the negative correlation between the share of firms that feel corruption is serious and the share that have confidence in the judiciary. This correlation is highest for Kenya. This suggests that firms which have lost confidence in the judiciary are

those that have actually been subject to serious corrupt practices. The second correlation that holds in all countries is the positive one between the share that feel corruption is a serious problem and the share of contract value paid to government officials. The highest value for this correlation is found in Tanzania. As was argued earlier, the implication of this is that firms who pay more in bribes feel most affected by corruption.

Interestingly, there is an inverse correlation between the share of Ugandan firms that make unofficial payments, and the share that feels corruption is a serious obstacle. It appears that unofficial payments in Uganda actually enhance business rather than deter it. This may be linked to the fact that such payments are relatively small as shown by the share of contract value paid to officials. In contrast, the correlation between unofficial payments and the perception of corruption is high for Tanzanian firms. The highest correlation is between the share of Tanzanian firms that make unofficial payments and the share of contract value paid to government officials.

Table 5.2: Correlations among Property Rights Indicators

	Feel judiciary will enforce property rights (%)	**Make unofficial payments (%)**	**Feel corruption is a serious obstacle (%)**
Kenya			
Make unofficial payments (%)	-0.16 (0.01)		
Feel corruption is serious obstacle (%)	-0.22 (0.00)	0.08 (0.18)	
Share of contract value paid to officials (%)	-0.12 (0.14)	0.17 (0.05)	0.12 (0.18)
Uganda			
Make unofficial payments (%)	0.04 (0.52)		
Feel corruption is serious obstacle (%)	-0.15 (0.01)	-0.15 (0.01)	
Share of contract value paid to officials (%)	0.01 (0.87)	0.01 (0.88)	0.14 (0.10)
Tanzania			
Make unofficial payments (%)	-0.11 (0.07)		
Feel corruption is serious obstacle (%)	-0.08 (0.15)	0.29 (0.00)	
Share of contract value paid to officials (%)	0.04 (0.57)	0.38 (0.00)	0.18 (0.01)

Note: Significance levels are indicated in parentheses.
Source: Authors' Computations

5.5 Infrastructure in the EAC

The literature showed that infrastructure is critical for private investment. Table 5.3 gives an indication of the state of infrastructure provision in the EAC. It shows the average number of

days that firms experienced interruptions in the provision of electricity, water, fixed telephones, and transport. Kenyan firms experienced the most electricity problems. Tanzanian firms had the most interruptions with respect to water, telephones and transport. Overall, Ugandan firms appear to be least affected by poor infrastructure.

Table 5.3: Number of Days Firms Experience Interruptions in Infrastructure Facilities

	Electricity	**Water**	**Fixed Telephone**	**Transport**
Kenya	83.8	85.2	35.8	18.2
Uganda	55.2	6.1	17.8	14.9
Tanzania	67.2	105.0	49.6	24.6

Source: World Bank (2002/03), Investment Climate Surveys
Kenya (n=248) Uganda (n=289) Tanzania (n=261)

The most serious constraints are inadequate electricity and water, at least in the case of Kenya and Tanzania. This is likely to lead firms to invest in providing these facilities for themselves. Ugandan firms on the other hand will be better catered for by public infrastructure. Consistent with this argument, Table 5.4 shows that a substantially smaller share of Ugandan firms has generators and boreholes. This suggests that the cost of doing business in Kenya and Tanzania will be increased by the need to provide infrastructure privately.

Table 5.4: Share of Firms with a Generator and a Borehole (%)

	Kenya	**Uganda**	**Tanzania**
Share with generator (%)	69.9	35.3	54.3
Share with borehole (%)	0.34	0.13	0.35

Source: World Bank (2002/03), Investment Climate Surveys
Kenya (n=278) Uganda (n=300) Tanzania (n=271)

5.6 Investment in the EAC

Table 5.5 shows the share of firms that invested in machinery and equipment for the period 2000-2002. For each year Kenya had the largest share of firms investing. This is reflective of the finding in chapter 3 that Kenya has the oldest machinery and equipment. Relative to firms in the other countries, Kenyan firms are more likely to have an obsolete capital stock. Another possible reason for this is the difference in size structure. If larger firms are more likely to invest than smaller ones, then investment will be higher in Kenya.

There are several factors that may lead to more investment by large firms. These include their greater market access (including opportunities in export markets) and their better access to finance. It is also interesting to note that although Kenyan firms face the most corrupt environment, a greater share of firms invest in Kenya compared to Uganda and Tanzania. This suggests that firms in Kenya may have adapted to doing business in an environment where property rights violations are prevalent.

Moreover, chapter 1 showed that Kenya is a larger economy relative to Uganda and Tanzania. Chapter 1 also showed that Kenya has a more developed financial sector. As a result of these macroeconomic factors, Kenyan firms may face greater investment opportunities and be better positioned to pursue them.

Table 5.5: Share of Firms Investing in Machinery and Equipment (%)

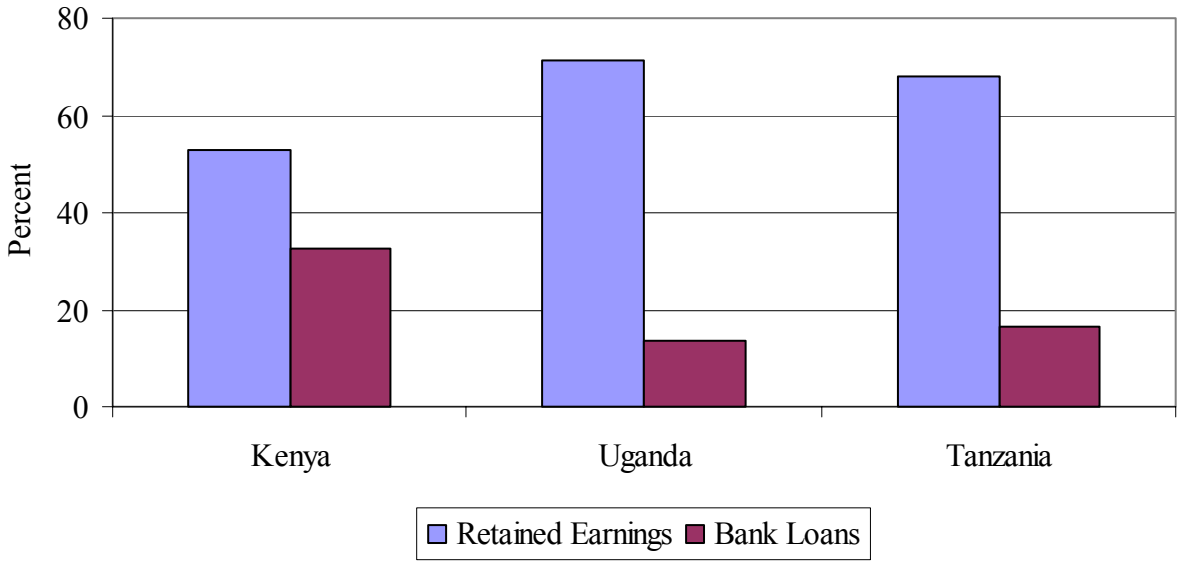
	Kenya	**Uganda**	**Tanzania**
2000	66.0	42.3	21.4
2001	66.3	44.0	28.6
2002	73.9	46.3	33.3

Source: World Bank (2002/03), Investment Climate Surveys
Kenya (n=282) Uganda (n=300) Tanzania (n=276)

Uganda has the smallest percentage increase of firms undertaking investment in machinery and equipment. This is supportive of the fact that Uganda has the youngest capital stock as was seen in chapter 3. Ugandan firms are least likely to have obsolete machinery and equipment. Tanzania which has the smallest share of firms with confidence in the judiciary to enforce their property rights, also has by far the smallest share of firms investing in each year. This suggests that property rights do have an effect on the investment decisions of firms.

Figure 5.2 shows the relative use of retained earnings and bank loans in financing new investment. Kenyan firms depend less on retained earnings and also make greater use of bank loans compared to Ugandan and Tanzanian firms. This is consistent with the results in chapter 2 which showed that Kenyan firms have substantially greater access to external finance. The high dependence on retained earnings in Uganda and Tanzania partly explains why the number of firms undertaking investment in these countries is significantly lower than those investing in Kenya.

Figure 5.2: Retained Earnings and Bank Loans as a Share of New Investment (%)



Source: World Bank (2002/03), Investment Climate Surveys
Kenya (n=172) Uganda (n=204) Tanzania (n=166)

5.7 Estimation of Investment Equation

This section empirically investigates the effect of the property rights environment on investment. It also examines the role that internal finance and access to bank loans has on the investment decision taken by firms. Based on the transmission mechanism, once the legal environment has improved access to external financing, firms use these funds in addition to internally generated funds to undertake productive investment. Access to bank loans and greater availability of internal finance are expected to have a positive effect on investment.

The investment equations are estimated followed by a discussion of the results. The dependent variable is the probability that the firm invested in machinery and equipment in 2002. Given the large number of firms that do not invest, the estimation is done using a probit model allowing us to have the maximum possible number of firms. This is similar to Bigsten et al (1999) who use a logit specification. The dependent variable is given by equation (1):

Invested in 2002 = 1 (1)
Did not invest in 2002 = 0

Explanatory Variables

Property Rights: Property rights are measured using the first and third indicators in Table 5.1. The first variable takes a value of 1 if a firm has confidence in the judiciary and 0 otherwise[30]. This variable is expected to have a positive effect on investment. The second variable takes a value of 1 if firms make unofficial payments and 0 otherwise. Unofficial payments give an indication of how corruption by government officials affects the investment decision taken by firms. The variable is in line with the definition of corruption in chapter 1. McArthur and Teal (2002) and Johnson et al (2002b) also use this variable in their estimations. The literature suggests that the effect of this variable is ambiguous. On the one hand these payments diminish the return from investment accruing to the firm. This reduces the incentive to invest. On the other hand, unofficial payments may be necessary to secure business licenses and building permits, and to obtain access to basic services. In this case the efficient corruption hypothesis argues that unofficial payments actually make it possible for the firm to better position itself with regard to pursuing investment opportunities.

The share of firms that feel corruption is a serious problem is not used because this measure is highly subjective. For example tolerance for corruption may differ across firm size, ethnicity, and education level. Notably, the problem of subjectivity can not be ignored for the indicator based on perceptions about confidence in the judiciary. However, the perception of corruption also has the potential problem of endogeneity as several authors have argued (see Acemoglu and Verdier, 1998; Ehrlich and Lui, 1999). Excluding this variable does not eliminate the possibility of endogeneity completely, but it does help to reduce its presence in the model. The issue of endogeneity will be considered in more detail later in this section. The share of contract value is not used because of its correlation with the share of firms that make unofficial payments. Moreover, this variable is specific to government contracts. Using it would imply that all investment decisions are driven by government projects, which is not true.

Access to bank loans: Firms with access to bank loans are in a better position to undertake investment compared to firms without bank loans (they are less credit constrained). Having a bank loan allows firms to pursue investment opportunities that could not be financed by internal sources alone. The variable takes a value of 1 if firms obtained a loan in 2001/2002 and 0

[30] This is the same variable we used to measure the effect of the legal system on trade credit supply in chapter 4.

otherwise. Examining the effect of bank loans provides a link between the first and second stages of the transmission mechanism.

Growth in Sales: The accelerator effect implies that firms experiencing a higher growth rate in their sales would invest more. The average annual growth rate of sales between 2000 and 2002 is used to capture this effect. An increase in sales implies that firms will anticipate a rise in demand for their products, which in turn will encourage investment. Growth in sales is also a proxy for internally generated funds. As sales grow one can expect firms to have more retained earnings at their disposal. Both the demand effect and the internal funds effect are expected to have a positive effect on investment[31].

Infrastructure: Poor access to infrastructure is expected to have a negative effect on the decision to invest. Erratic electricity and water supply adversely affect a firm's operations, as do poor telecommunications and transport networks. Important to note though is that firms may decide to invest in providing their own infrastructure in the event that public provision is insufficient. This will tend to increase the cost of production. A binary indicator based on the measures in Table 5.3 is constructed to measure the effect of infrastructure. First, an additive index is obtained by summing up all the 4 measures. The larger this index the more inadequate infrastructure is a problem for firms. Firms with a value above the median value of this index are categorised as severely constrained by inadequate infrastructure. The binary variable takes a value of 1 if the index is above the median value and 0 otherwise.

Firm age: Older firms may need to replace old machinery and equipment and to purchase more real estate for expansion purposes. At the same time, younger firms require machinery and equipment in order to position themselves as viable producers in their market. These firms may also have greater need for real estate than older firms. The impact of this variable is ambiguous.

Firm size: Larger firms may need to invest in order to satisfy their share of the market. However, in order for small firms to compete with larger firms, they need to acquire capital. This variable also has an ambiguous effect.

[31]The literature has shown that profitability is a key incentive to invest. We also expect more profitable firms to be in a better position to finance investment internally. However, we explained in chapter 3 that our profitability variable has limitations. Growth in sales compensates to some extent for the lack of an adequate profitability measure.

Local ownership: Locally-owned firms may have better information about investment opportunities compared to foreign-owned firms. However, foreign-owned firms may have more resources to invest than locally-owned firms as well as access to larger markets. Again, the effect of this variable is ambiguous.

Exporting: Firms that export could have access to greater market opportunities than non-exporting firms. In addition, returns from export markets could exceed returns from local markets. It is expected that being an exporting firm will have a positive effect on investment.

Expectations about inflation: Firms were asked whether or not an increase in inflation was likely or not in the next three years. Higher inflation is associated with greater uncertainty about the macroeconomic environment and can therefore have a negative effect on investment. On the other hand, firms may decide to invest now in order to avoid the higher cost of capital in the future and to take advantage of higher profits resulting from price increases. This variable also has an ambiguous effect.

Industry differences: There may be investment opportunities that are industry specific. Some industries may have better growth prospects than others.

The investment equation is therefore given by:

$$\Pr(\text{Invest in 2002}) = F(C, UP, AL, GIS, I, A, E, LO, EX, EXI, I) \qquad (2)$$

Where C, UP, AL, GIS, I, A, E, LO, EX, EXI, I are confidence in the judiciary, unofficial payments, access to loans, growth in sales, infrastructure deficiency, firm age, employment, local ownership, exporting firm, expectations about inflation, and industry dummies respectively.

To begin, the relative effects of property rights, access to external finance and availability of internal finance on the decision to invest are examined. These are the key channels of the transmission mechanism. Industry effects are taken into consideration. Like in chapters 3 and 4, the estimation obtains the Huber-White robust estimator. The results are presented in Table 5.6 below.

Table 5.6: The Effect of Property Rights and Finance on Investment in the EAC

	Kenya	Uganda	Tanzania
Confidence in Judiciary	0.504	0.638**	-0.810**
	(1.37)	(2.14)	(-2.34)
Unofficial Payments	0.384	0.206	0.355
	(1.30)	(0.75)	(1.56)
Loan	0.634*	1.005***	1.122***
	(1.90)	(2.71)	(3.77)
Growth in Sales	5.22***	0.524	0.250**
	(4.81)	(1.48)	(2.34)
Agroindustry	0.609	0.676	0.379
	(1.35)	(0.94)	(1.01)
Metal	-0.395	0.747	0.258
	(-0.94)	(0.91)	(0.55)
Furniture and Wood	0.827	0.513	-0.086
	(1.28)	(0.67)	(-0.21)
Chemicals	0.558	1.615*	0.512
	(0.78)	(1.67)	(1.16)
Construction Materials	-1.713**	0.425	0.455
	(2.68)	(0.56)	(0.78)
Plastics	-0.310	-	1.428*
	(-0.58)	-	(1.82)
Paper, Printing & Publishing	0.060	0.701	0.482
	(0.12)	(0.76)	(1.00)
Constant	0.030	-1.391*	-1.021***
	(0.08)	(-1.91)	(-3.00)
Number of Observations	132	120	159
Log-Likelihood	-51.77	-67.57	-83.10
Wald $-\chi^2$	32.59***	16.86*	31.54***
Pseudo R^2	0.28	0.15	0.17

Dependent variable: Probability that the firm invested in machinery and equipment in 2002.
*, **, and *** indicate significance at 10 percent, 5 percent, and 1 percent respectively. Numbers in parentheses are z statistics. For the model to be properly identified, the plastics industry dummy is dropped for Uganda. The identification problem was explained in detail in chapter 3.

Confidence in the judiciary has a significant positive effect on investment in Uganda. This is consistent with the hypothesis that secure property rights promote investment. It shows that the second part of the transmission mechanism from finance to growth holds to some extent. Recall from Table 5.2 and 5.3 that corruption is much less an obstacle to doing business in Uganda relative to the other 2 countries. This indicates that enforcement of property rights by the judiciary has a more meaningful effect on investment where the severity of corruption is relatively low. Furthermore, recall that chapter 2 showed enforcement costs were lowest in Uganda relative to the other 2 countries (Figures 2.2, 2.3, and 2.4). Therefore, greater efficiency of the judiciary enhances the transmission mechanism.

The results for Tanzania are surprising: confidence in the judiciary has a negative insignificant effect. This is hard to explain and contrary to expectations. It implies that firms which "take the law into their own hands" rather than depend on the court mechanism are more likely to invest.

For example, firms that prefer to bribe public officials to expedite payments for work undertaken for government are more likely to invest than firms that rely on the court system to resolve potential disputes arising over these payments. Thus, the court system is unable to enforce property rights in a manner that promotes investor confidence. This is consistent with the fact that compared to Kenya and Uganda, a significantly smaller share of Tanzanian firms express confidence in the judiciary.

For all countries unofficial payments have a positive, though insignificant effect on investment decisions. This lends some support to the view that corruption can enhance business by helping firms to bypass bureaucratic red tape. Access to bank loans impacts investment positively across the 3 countries. This effect is highly significant in the case of Uganda and Tanzania, which is consistent with the findings in chapter 2 showing that firms in these countries are more credit constrained than Kenyan firms. The implication is that the transmission mechanism from finance to investment through the legal environment is important for growth. The result shows that improvements to the legal system meant to enhance bank lending will have a meaningful effect on the ability of EAC firms to undertake investment.

Growth in sales positively affects the decision to invest in all countries, exerting a significant impact in Kenya and Tanzania. Thus, internal finance (and expected demand) is important for investment decisions. Firms in the chemicals and plastics industries are more likely to invest in Uganda and Tanzania respectively. Kenyan firms in the construction industry have a lower probability of investing.

Figure 5.1 alludes to some interactions amongst the main explanatory variables. There are 2 indirect effects that were mentioned: (a) legal environment enhances the use of external finance (b) the legal environment enhances the use of internal finance. Another possible interaction is between the 2 different sources of finance. One would expect that the 2 sources work together to enhance a firms ability to invest. Therefore, it is useful to investigate whether these interactions are important for the decision to invest.

Before proceeding it is important to note that interaction effects in non-linear models can not be correctly obtained using the procedures used for linear models. According to Ai and Norton (2003) and Norton et al (2004) the magnitude of interaction effects in nonlinear models do not equal the marginal effects of interaction terms, can be of opposite sign, and are not computable

using standard software. They show that whereas the interaction effect of two variables in a linear model can be measured using the parameter estimate, this does not hold for nonlinear models. Rather, for nonlinear models the magnitude of the interaction effect depends on the cross derivatives with respect to the dependent variable. These authors propose a procedure that can be implemented using Stata to obtain correct marginal effects and standard errors[32]. This procedure involves estimating a probit/logit model including the interaction term. This is immediately followed by the inteff command option in Stata.

Tables 5.7, 5.8, and 5.9 show the interaction between (a) having confidence in the judiciary and access to bank loans, (b) having confidence in the judiciary and internal finance and (c) having internal finance and external finance respectively. Table 5.7 does not report any results for Kenya because interaction 1 is dropped for Kenya. This is a result of underidentification, which occurs when one or more of the independent variables perfectly predict a particular outcome[33].

The interaction effects carry a positive effect for Tanzania in Tables 5.7, 5.8 and 5.9 and for Kenya in Tables 5.8 and 5.9. This is in line with the argument that these variables work together to enhance a firms decision to invest. However, a negative sign is observed in the case of Uganda for all 3 interaction effects. The Ugandan result appears counterintuitive given that all the variables exert a positive effect in Table 5.6. Given Ai and Norton (2003) and Norton et al's (2004) observations about signs of interaction effects in nonlinear models, it is not possible to infer directional impacts of the interaction parameters. However, the legal environment affects firms' decisions to use externally generated funds for investment, in addition to independently impacting firms' investment decisions (for Uganda, interaction 1 has a Z-stat of -1.86, significant at 10 percent).

[32] Results of this procedure are presented and briefly discussed in the Appendix. The procedure did not resolve the sign problem.
[33] Underidentification was discussed in detail in chapter 3.

Table 5.7: Interaction between Confidence in Judiciary and Access to Loans

	Uganda	Tanzania
Confidence in Judiciary	0.887***	-0.823*
	(2.82)	(-1.91)
Unofficial Payments	0.264	0.355
	(0.95)	(1.56)
Loan	1.475***	1.115***
	(3.57)	(3.24)
Growth in Sales	0.727**	0.251**
	(2.14)	(2.33)
Interaction 1	-1.391*	0.032
	(-1.86)	(0.04)
Agroindustry	0.587	0.382
	(0.83)	(1.00)
Metal	0.783	0.260
	(0.96)	(0.55)
Furniture and Wood	0.539	-0.084
	(0.71)	(-0.21)
Chemicals	1.588	0.515
	(1.58)	(1.14)
Construction Materials	0.416	0.456
	(0.56)	(0.78)
Plastics	-	1.430*
	-	(1.82)
Paper, Printing & Publishing	0.708	0.484
	(0.76)	(1.02)
Constant	-1.495*	-1.022***
	(-2.07)	(-3.00)
Number of Observations	120	159
Log-Likelihood	-67.27	-84.84
Wald – χ^2	24.84***	31.78***
Pseudo R^2	0.17	0.17

Dependent variable: Probability that the firm invested in machinery and equipment in 2002.
*, **, and *** indicate significance at 10 percent, 5 percent, and 1 percent respectively. Numbers in parentheses are z statistics. For the model to be properly identified, the plastics industry dummy is dropped for Uganda. The identification problem was explained in detail in chapter 3.

Table 5.8 shows that the legal environment affects firms' decision to use internally generated funds for investment purposes, in addition to the individual direct effects of property rights and internal finance on the investment decision (for Uganda, interaction 2 has a Z-stat of -2.10, and for Tanzania it has 4.12, which are significant at 5 percent and 1 percent levels, respectively).

Table 5.8: Interaction between Confidence in Judiciary and Internal Finance

	Kenya	Uganda	Tanzania
Confidence in Judiciary	0.494	0.957***	-2.325***
	(1.31)	(2.88)	(-2.96)
Unofficial Payments	0.384	0.239	0.331
	(1.30)	(0.83)	(1.44)
Loan	0.632*	1.246***	1.083***
	(1.90)	(3.08)	(3.49)
Growth in Sales	5.172***	1.807**	0.194*
	(4.44)	(2.25)	(1.86)
Interaction 2	0.404	-2.101**	4.118***
	(0.15)	(-2.31)	(2.81)
Agroindustry	0.609	0.570	0.403
	(1.35)	(0.89)	(1.06)
Metal	-0.394	0.803	0.303
	(-0.94)	(1.10)	(0.63)
Furniture and Wood	0.820	0.496	-0.065
	(1.28)	(0.72)	(-0.16)
Chemicals	0.550	1.636*	0.505
	(0.78)	(1.75)	(1.14)
Construction Materials	-1.727**	0.370	0.473
	(2.69)	(0.55)	(0.81)
Plastics	-0.311	-	1.436*
	(-0.58)	-	(1.84)
Paper, Printing & Publishing	0.057	0.703	0.578
	(0.12)	(0.81)	(1.18)
Constant	0.034	-1.570**	-1.012***
	(0.09)	(-2.40)	(-2.91)
Number of Observations	132	120	159
Log-Likelihood	-51.76	-65.96	-82.32
Wald – χ^2	32.91***	22.29**	29.91***
Pseudo R^2	0.28	0.19	0.20

Dependent variable: Probability that the firm invested in machinery and equipment in 2002.
*, **, and *** indicate significance at 10 percent, 5 percent, and 1 percent respectively. Numbers in parentheses are z statistics. For the model to be properly identified, the plastics industry dummy is dropped for Uganda. The identification problem was explained in detail in chapter 3.

In Table 5.9 there is evidence that firms' access to external finance even when such firms have internally generated funds further impacts the firms' investment decisions (for Uganda, interaction 3 has a Z-stat of -1.76 and for Tanzania it has 2.22, both of which are significant at the 10 percent and 5 percent levels, respectively).

Table 5.9: Interaction between Internal Finance and Access to Loans

	Kenya	Uganda	Tanzania
Confidence in Judiciary	0.519	0.734***	-1.038**
	(1.40)	(2.45)	(-2.59)
Unofficial Payments	0.360	0.226	0.288
	(1.23)	(0.79)	(1.23)
Loan	0.674**	1.224***	0.674*
	(2.11)	(3.11)	(1.88)
Growth in Sales	6.480***	1.104**	0.243***
	(4.02)	(2.00)	(2.49)
Interaction 3	-2.494	-1.004*	2.374**
	(-1.28)	(-1.76)	(2.22)
Agroindustry	0.655	0.622	0.414
	(1.47)	(0.92)	(1.07)
Metal	-0.363	0.825	0.231
	(-0.88)	(1.05)	(0.47)
Furniture and Wood	0.881	0.481	-0.019
	(1.40)	(0.66)	(-0.05)
Chemicals	0.614	1.645*	0.571
	(0.82)	(1.75)	(1.26)
Construction Materials	-1.714**	0.400	0.445
	(2.71)	(0.57)	(0.75)
Plastics	-0.220	-	1.389*
	(-0.41)	-	(1.70)
Paper, Printing & Publishing	0.098	0.692	0.548
	(0.20)	(0.77)	(1.12)
Constant	-0.029	-1.473*	-1.007***
	(-0.08)	(-2.15)	(-2.87)
Number of Observations	132	120	159
Log-Likelihood	-51.20	-67.57	-83.10
Wald – χ^2	36.00***	25.77***	28.95***
Pseudo R^2	0.28	0.17	0.19

Dependent variable: Probability that the firm invested in machinery and equipment in 2002.
*, **, and *** indicate significance at 10 percent, 5 percent, and 1 percent respectively. Numbers in parentheses are z statistics. For the model to be properly identified, the plastics industry dummy is dropped for Uganda. The identification problem was explained in detail in chapter 3.

An alternative technique to ascertaining interaction effects of the transmission channels is now considered[34]. This is done by using a matrix of firms showing the proportion of firms that both meet an interaction condition (have the two interaction variables) and invest in fixed capital, relative to the average proportion of country firms that invested in fixed capital. If the proportion (percent) per each interaction is greater than the average country proportion of investing firms, it is inferred that the said interaction positively enhances the decision to invest, and vice-versa. As is clear from Table 5.10, interactions 1 and 3 are effective in fostering the transmission mechanism in Kenya (83 percent and 79 percent, respectively, relative to 74 percent, which is the average proportion of the country's investing firms).

[34] The procedure proposed by Ai and Norton (2003) and Norton et al (2004) discussed in the Appendix did not resolve the sign problem.

Table 5.10: A Matrix of Interaction Terms Relative to Fixed Investment Decisions

	Kenya			Uganda			Tanzania		
	Int 1	Int 2	Int 3	Int 1	Int 2	Int 3	Int 1	Int 2	Int 3
(1) Firms with both variables	12	46	33	14	83	34	10	39	32
(2) Proportion of firms in (1) that invested	10 (83%)	34 (74%)	26 (79%)	8 (57%)	44 (53%)	25 (74%)	5 (50%)	13 (33%)	23 (72%)
(3) Percent of investing firms per country sample	74%	74%	74%	46%	46%	46%	33%	33%	33%
(4) Total firms in country sample	284	284	284	300	300	300	276	276	276

Note: Interaction 1(Int 1) = confidence in judiciary*loans, interaction 2 (Int 2) = confidence in judiciary*growth of sales, and interaction 3 (Int 3) = loans*growth in sales. Further, note that the (%) in parentheses in row (2) is the share of firms among firms that have both characteristics of the interaction term.

Interestingly, Uganda for which the traditional technique indicates negative signs for all the interaction terms now shows all interactions to be effective in fostering the transmission mechanism (57 percent, 53 percent and 74 percent for interactions 1, 2 and 3, relative to the country's average proportion of sample firms that invested of 46 percent). Tanzania exhibits outcomes similar to Kenya's, wherein interactions 1 and 3 appear effective in enhancing the transmission flow. In other words, the author can infer that the property rights environment in these two countries seems not to strengthen the decision to make fixed investments by firms that possess internal finance as well. This result is reflective of the fact that these 2 countries indicate a weaker property rights environment than Uganda.

The results of the full model given by equation (2) are presented in Table 5.11 below. The impact of confidence in the judiciary to enforce property rights is similar to what was observed in the previous tables. It has a positive, though insignificant effect on investment in Kenya. In Uganda confidence in the judiciary has a significant positive effect. This robust result for Uganda lends further support to the earlier argument that the judiciary is more likely to have a meaningful effect on economic activity when the severity of corruption is minimized. In the case of Tanzania confidence in the judiciary to enforce property rights maintains a negative significant effect on the decision to invest.

This variable also gave an unexpected result for Tanzania in chapter 4. As argued there, the possibility of data problems can not be ruled out.

Table 5.11: Explaining Investment in Machinery and Equipment in the EAC

	Kenya	Uganda	Tanzania
Confidence in Judiciary	0.715	0.724**	-1.600***
	(1.56)	(2.01)	(-3.53)
Unofficial payments	0.729**	0.084	0.328
	(2.03)	(0.27)	(1.18)
Loan	0.650*	0.655	1.209***
	(1.79)	(1.51)	(2.46)
Growth in Sales	4.68***	0.694*	0.206*
	(4.04)	(1.70)	(1.73)
Infrastructure	0.208	-0.750	-0.358
	(0.46)	(-1.17)	(-0.47)
Log Firm Age	0.055	0.273	-0.110
	(0.25)	(1.24)	(-0.62)
Log Employment	0.551***	0.136	0.258**
	(3.12)	(0.96)	(2.26)
Local Ownership	0.131	0.187	-0.064
	(0.35)	(0.41)	(-0.14)
Exporter	0.708**	0.975**	0.687**
	(2.07)	(2.06)	(2.12)
Inflation expectations	-0.383	0.423	-0.100
	(-1.08)	(1.46)	(-0.36)
Agroindustry	0.349	0.749	0.303
	(0.76)	(0.95)	(0.69)
Metal	-0.346	0.895	0.971*
	(-0.71)	(1.01)	(1.86)
Furniture and Wood	1.232*	0.963	0.269
	(1.72)	(1.13)	(0.57)
Chemicals	0.436	1.135	0.534
	(0.51)	(1.16)	(1.06)
Construction Materials	-1.821**	0.257	0.753
	(-2.34)	(0.31)	(1.10)
Plastics	-0.545	-	0.409
	(-0.93)	-	(0.55)
Paper, Printing & Publishing	0.186	0.649	0.662
	(0.37)	(0.70)	(1.23)
Constant	-2.885***	-2.301*	-1.490
	(-2.73)	(-1.74)	(-1.30)
Number of Observations	131	119	135
Log-Likelihood	-41.93	-59.24	-62.14
Wald $-\chi^2$	45.66***	32.51***	39.62***
Pseudo R^2	0.41	0.26	0.28

Dependent variable: Probability that the firm invested in machinery and equipment in 2002.
*, **, and *** indicate significance at 10 percent, 5 percent, and 1 percent respectively. Numbers in parentheses are z statistics. For the model to be properly identified, the plastics industry dummy is dropped for Uganda. The identification problem was explained in detail in chapter 3.

For all countries unofficial payments have a positive effect on investment decisions. Note that this effect is now significant in the case of Kenya. It indicates that corruption in Kenya actually

has a meaningful role in improving the ability of firms to conduct business[35]. This is consistent with the argument that corruption allows firms to bypass bureaucratic red tape and get on with doing business. It is also in line with Acemoglu and Verdier (1998) who argue that allowing some corruption may be optimal, rather than fully enforce property rights. This result suggests that firms that are willing to make unofficial payments will be more successful in their applications for business licenses and other important requirements for the running of their firms.

Although this result for Kenya agrees with the theoretical argument that corruption removes bureaucratic obstacles to doing business, it is in contrast with existing empirical evidence which shows that corruption negatively affects investment. This can be attributed to 2 main factors. First, the majority of evidence is based on macro level studies which do not capture the firm level characteristics contained in this study. Second, previous studies have examined the effect of corruption on the amount of investment, not on the decision to invest. Specifically, these studies have examined the effect of corruption on the investment to GDP ratio (in the case of macro studies) and on the reinvestment rate (in the case of micro studies). The limitations of the data do not allow the study to pursue this type of analysis.

Access to bank loans maintains a positive effect on investment decisions in all countries. This effect is significant for Kenya at 10 percent and for Tanzania at 1 percent. Thus, bank finance is important for economic activity in the EAC countries. Growth in sales continues to exert a positive significant effect. This suggests that firms with more internal sources of finance are in a better position to pursue investment opportunities. It also indicates that anticipation of increased demand stimulates investment as hypothesized by the accelerator theory. The implication of this is that macroeconomic policies to stimulate demand can have a positive effect on manufacturing activity. The results also show that firms with more internal sources of finance are in a better position to pursue investment opportunities.

Inadequate infrastructure has a negative impact on investment in Uganda and Tanzania. In Kenya, poor infrastructure exerts a positive impact on the decision to invest. This is in line with Table 5.4 which showed that a large share of Kenyan firms purchase boreholes and generators. The effect of infrastructure is however insignificant for all the countries[36].

[35] It also shows how difficult it is to accurately interpret perceptions about corruption can be. In Table 5.1 we observe that Kenya has the highest share of firms negatively affected by corruption.
[36] Macro level studies have found infrastructure to be important for investment. Our insignificant results may reflect the difficulty of capturing the infrastructure effect using micro data, particularly when the data are cross sectional.

Older firms are more likely to invest in Kenya and Uganda. This implies that firms with outdated machinery and equipment are replacing it. On the other hand, older firms in Tanzania invest less. This suggests that more of the investment in Tanzania is being undertaken by new firms. It indicates that economic reform has encouraged the entry of new firms into the manufacturing sector. However, for all three countries firm age has an insignificant effect on investment.

Firm size has a positive effect on investment in all three countries. This effect is significant at 1 percent and 5 percent for Kenya and Tanzania respectively, but insignificant for Uganda. Investment is being undertaken predominantly by large firms reflecting the larger market opportunity and better access to finance that these firms enjoy. It is a fairly important result because it implies that SMEs in the EAC are not providing the growth impetus that they are expected to. The business environment is tipped in favour of large firms, suggesting that policies to enhance the growth of SMEs have not been very successful in the case of the manufacturing sector.

Locally owned firms are more likely to invest in Kenya and Uganda, but less likely to do so in Tanzania. Although the effect of local ownership is insignificant across the 3 countries, it does suggest that Foreign Direct Investment (FDI) is important for manufacturing activity in Tanzania. Being an exporter has a positive significant effect on investment in all countries. Export markets stimulate an increase in demand for EAC products, which in turn will lead to greater investment by manufacturing firms in these economies. The results indicate that export led manufacturing has the potential to be an economically significant characteristic of the EAC.

Expectations about higher inflation have a negative effect on investment in Kenya and Tanzania. In Uganda inflation expectations have a surprising positive effect on investment. It may be the case that Ugandan firms decide to invest now in order to avoid higher costs of machinery and equipment in the future. It may also be the case that they invest in anticipation of higher profits due to rising prices. Nevertheless, for all countries the impact of inflation expectations is insignificant. The results indicate that Kenyan firms in the furniture industry are more likely to invest while firms in the construction industry are less likely to invest. Being in the metal industry in Tanzania increases the likelihood that a firm will invest. No significant industry differences are present in Uganda.

Given that probit coefficients can not be interpreted in the same way as linear coefficients, it is instructive to compute the marginal probability elasticities and marginal effects as was done in chapters 3 and 4. These are presented in Table 5.12 below and discussed with reference to variables found to be significant (marked with an asterisk).

Table 5.12: Marginal Probability Elasticities and Marginal Effects

	Kenya	Uganda	Tanzania
Marginal Probability Elasticity			
Growth in Sales	0.647*	0.273*	0.071*
Log Firm Age	0.008	0.108	-0.038
Log Employment	0.076*	0.053	0.089*
Marginal Effect			
Confidence in Judiciary	0.077	0.283*	-0.349*
Unofficial payments	0.107*	0.033	0.115
Loan	0.081*	0.256	0.452*
Local Ownership	0.019	0.073	-0.022
Exporter	0.098*	0.370*	0.252*
Infrastructure	0.032	-0.287	-0.133
Inflation expectations	-0.055	0.162	-0.034
Agroindustry	0.043	0.291	0.108
Metal	0.057	0.339	0.368*
Furniture and Wood	0.079*	0.367	0.096
Chemicals	0.046	0.405	0.200
Construction Materials	-0.538*	0.102	0.288
Plastics	-0.102	-	0.152
Paper, Printing & Publishing	0.023	0.253	0.251

Marginal probability elasticity is the derivative of the dependent variable with respect to a continuous explanatory variable while holding the other variables constant. Marginal effect is the change in the dependent variable associated with a discrete change in a dummy variable from 0 to 1.

Confidence in the judiciary has a large effect in both Uganda and Tanzania. In Uganda firms that are confident that the judiciary will enforce their property rights are 28 percent more likely to invest. On the contrary, Tanzanian firms that rely on the judiciary are 35 percent less likely to invest. Clearly, the judicial process in Uganda is more efficient than in the other countries. The results also show that Kenyan firms that make unofficial payments are 11 percent more likely to invest, giving further indication of how corruption can reduce the bureaucratic obstacles to doing business.

Growth in sales exerts a positive significant effect across all countries. It has a large marginal probability elasticity in the case of Kenya and Uganda. A 1 percent rise in the growth rate of sales leads to a 0.65 percent and 0.27 percent increase in the likelihood that Kenyan and Ugandan firms will invest respectively. This shows that the availability of internal finance and the accelerator effects are critical for investment. Being an exporter is also significant for all

countries. Table 5.12 shows that the impact of this variable is largest in Uganda and Tanzania where it is associated with a 37 percent and 25 percent greater likelihood of investment respectively. Firm size and access to bank loans are significant in Kenya and Tanzania. The marginal probability elasticity of size is below 10 percent for each country. However, having a bank loan exerts a large effect in Tanzania. Firms with loans are 45 percent more likely to invest than firms that do not have loans. This lends further support to the view that Tanzanian firms are constrained by a lack of external finance.

Endogeneity

Several authors have argued that corruption is endogenous (see for example Acemoglu and Verdier, 1998; Ehrlich and Lui, 1999; Blackburn et al, 2004; Gyimah-Brempong, 2002; and Mauro, 2004). In this section a test for the endogeneity of the unofficial payments indicator is performed. Once firms decide to invest they may have to pay unofficial payments to public officials in order to ensure that they have the necessary permits and licenses needed to implement their investment decisions. This means that causality would run from investment decision to unofficial payments. The implication is that the significant result for Kenya may not be reliable.

A two-stage Durbin-Wu-Watson (DWH) test, following Davidson and MacKinnon (1993) is used to test for endogeneity. The test is also used by McArthur and Teal (2002) who employ firm level indicators of corruption similar to what is found in this study. The focus is on Kenya because it is the only country where unofficial payments were found to be significant. The results of the test are reported in Table 5.13.

In the first stage of the DWH test a probit is estimated where the unofficial payments indicator is the dependent variable. The exogenous variables enter in the right hand side of the equation. In the second stage the residuals from the first stage regression are included in the original investment equation. If the residuals are found to be significant endogeneity cannot be rejected. Unofficial payments remain significant in explaining the investment decision in Kenya. The results show that the residuals variable is insignificant. This means that the DWH test rejects endogeneity of unofficial payments in Kenya[37]. Therefore the probit results are appropriate for measuring the effect of unofficial payments on investment decisions taken by firms.

[37] McArthur and Teal (2002) also found no evidence of endogeneity.

Table 5.13:Durbin-Wu-Hausman Test for Endogeneity of Unofficial Payments in Kenya

	First Stage	Second Stage
Confidence in Judiciary	-0.488*	2.356
	(-1.78)	(1.37)
Unofficial payments		0.748**
		(2.09)
Loan	-0.038	0.825**
	(-0.15)	(2.02)
Growth in Sales	-0.448	6.169***
	(-1.37)	(3.37)
Infrastructure	0.093	-0.193
	(0.26)	(-0.36)
Log Firm Age	-0.146	0.515
	(-0.83)	(1.08)
Log Employment	-0.026	0.641***
	(-0.27)	(3.18)
Local Ownership	0.096	-0.198
	(0.35)	(-0.42)
Exporter	-0.342	1.797
	(-1.38)	(1.52)
Inflation expectations	0.363	-1.560
	(1.46)	(-1.25)
Residual		8.496
		(0.98)
Agroindustry	-0.375	1.600
	(-1.04)	(1.19)
Metal	0.069	-0.596
	(0.17)	(-1.04)
Furniture and Wood	-0.220	1.938**
	(-0.43)	(1.98)
Chemicals	0.571	-1.232
	(1.05)	(-0.69)
Construction Materials	0.132	-2.257***
	(0.25)	(-2.54)
Plastics	0.791	-2.869
	(1.56)	(-1.16)
Paper, Printing & Publishing	-0.343	1.326
	(-0.79)	(1.06)
Constant	0.723	-9.628
	(0.90)	(-1.38)
Number of Observations	131	131
Log-Likelihood	-80.13	-41.61
Wald – χ^2	21.21	46.35***
Pseudo R^2	0.11	0.42

*, **, and *** indicate significance at 10 percent, 5 percent, and 1 percent respectively. Numbers in parentheses are z statistics. For the model to be properly identified, the plastics industry dummy is dropped for Uganda. The identification problem was explained in detail in chapter 3.

5.8 Conclusions

Opportunistic behaviour by public officials can affect the investment decisions taken by firms. In this chapter the author examined how the property rights environment affects investment by manufacturing firms in the EAC. To the best knowledge of the author this chapter is the first effort to empirically investigate how property rights affect investment in the African

manufacturing sector. It was found that firms who expect the judiciary to enforce their property rights are more likely to invest in machinery and equipment in Kenya and Uganda. This effect while insignificant for Kenya, is statistically meaningful in Uganda. It was observed that compared to Kenya and Tanzania, corruption is less serious as an obstacle to doing business in Uganda. This implies that the protection of property rights has a more important effect on investment in an environment where the costs of corruption are minimized. In addition, recall that chapter 2 showed enforcement costs were lowest in Uganda relative to the other 2 countries Therefore, greater efficiency of the judiciary enhances the transmission mechanism.

The transmission mechanism can also be negatively affected by a less efficient judiciary. Notably, Tanzania which has the smallest share of firms expecting the judiciary to enforce their property rights also has the smallest share of firms undertaking investment. Furthermore, it was found that Tanzanian firms who rely on the judiciary are less likely to invest in machinery and equipment. Although this is contrary to the expectations, it is consistent with the relatively high prevalence of corruption and the smaller share of firms who have confidence in the judicial process. The result could also be driven by poor data quality.

The results also showed that unofficial payments have a meaningful positive effect on the decision to investment in machinery and equipment in Kenya. This supports the view that corruption can enhance business activity. It is also consistent with Acemoglu and Verdier (1998) who argue that given the high costs of preventing corruption, it may be optimal not to fully enforce property rights. The effect of unofficial payments on the investment decision is positive though insignificant in the other 2 countries.

Access to bank loans is important for whether or not firms invest. The results suggest that a sound legal environment that encourages bank lending by protecting and enforcing creditor rights over collateral and financial information is crucial for investment in the EAC countries. The results also showed that growth in sales exerts a significant positive effect on the decision to invest. This means that anticipated increases in demand stimulate investment as predicted by the accelerator theory. It implies that macroeconomic policies aimed at stimulating demand can have a positive effect on manufacturing activity in the EAC. It also indicates that firms with more internal finance are better positioned to undertake investment opportunities.

The transmission mechanism from the legal environment to investment via financial variables (namely internal finance and access to bank loans) suggests that interactions between the key variables could be important for firms' decisions to pursue investment. This assertion does appear to hold in the context of the EAC. Using an innovative technique to correctly measure interaction effects in the case of nonlinear models, evidence showing a meaningful economic impact of these effects was found. This is particularly the case in Uganda where the property rights environment is superior to that of Kenya and Tanzania.

The results showed that export led manufacturing has the potential to be an economically significant characteristic of the EAC. It was found that the probability of larger firms investing in machinery and equipment is higher than the corresponding probability for small firms in all EAC countries. It appears that policies meant to stimulate investment by SMEs have not been very successful in the manufacturing sector. The business environment in the EAC continues to favour large firms.

Finally, it was observed that a substantially larger share of Kenyan firms invests in machinery and equipment relative to Ugandan and Tanzanian firms. This occurs although Kenya does not have a better property rights environment. This is partly explained by the fact that Kenya is a larger economy and has a higher level of financial development. Therefore, macroeconomic factors are also important in explaining investment.

CHAPTER 6: CONCLUSIONS AND POLICY RECOMMENDATIONS

6.1 Introduction

This dissertation has investigated how the legal environment affects access to external finance and investment in the three countries making up the East African Community (EAC), namely Kenya, Uganda and Tanzania. The dissertation has argued that the legal environment provides a transmission mechanism from finance, to investment and economic growth. First, the legal system is meant to provide strong protection and efficient enforcement of creditor rights. This leads to greater access to external finance by firms. Second, the legal system should clearly define and adequately protect the rights of firms over their investments, and the returns that are generated by these investments. This creates an environment that is conducive for investment by firms with both internal and external sources of finance.

The dissertation focused on 4 main issues. First, it examined how the quality of the legal system relates to access to external finance and the terms of this finance. Second, it examined how collateral and collateral substitutes affect access to bank finance. Third, it investigated how the legal environment affects access to non-bank finance. The study considered trade credit and leasing finance. Finally, it examined how the property rights environment affects investment. To the best knowledge of the author each of these issues has either been explored in a very limited manner or not examined at all at the firm level in the context of SSA.

In this chapter a summary of the key findings pertaining to each of these issues is provided. This chapter explains what the key findings collectively imply for the relationship between the legal environment on one hand, and access to credit and investment on the other. It also considers the policy implications of the findings and make suggestions for further research.

6.2 The Relationship Between the Legal Environment and Access to External Finance

Indicators of the quality of the legal system were presented in chapter 2. These indicators measured two aspects of the legal system with respect to credit markets, namely legal content and legal formalism (cost of enforcement). These indicators were compared against measures of access to bank finance and trade credit. Kenya was found to lead in terms of legal content, but to have by far the highest enforcement costs. Legal content was found to be poorest in Tanzania,

while enforcement costs were lowest in Uganda. The analysis showed that better access to finance is more closely correlated with high quality written law than with efficient enforcement. Kenyan firms have greater access to bank finance and trade credit than Ugandan and Tanzanian firms. This is true across firm size. Well defined creditor rights are of critical importance for the flow of funds from banks, and from firms extending trade credit. This is an important finding given that much of the micro literature has focused more on the role of enforcement costs.

Acute information asymmetries are a significant contributor to poor access to external finance in developing countries. The superior creditor rights found in Kenya appear to affect access to external finance via the information channel, rather than through the collateral (court) mechanism. The analysis showed that information asymmetry in financial markets is less where the legal content is strong. It was found that the availability of reliable financial information is significantly less in Tanzania and Uganda compared to Kenya. Thus, stronger protection of creditors leads to better financial information, which in turn has a positive effect on access to external finance.

The chapter also examined how the legal environment relates to the terms of credit faced by firms. In particular, the analysis focused on collateral requirements and the maturity of bank loans and trade credit. It was found that higher enforcement costs are strongly correlated with higher collateral requirements. However, even though banks in Kenya demand such high collateral requirements, Kenyan firms are not constrained from securing loans by this. Ugandan and Tanzanian firms face greater collateral constraints. Chapter 3 provided evidence suggesting that the high enforcement costs actually make collateral irrelevant for access to bank loans in Kenya. There was no evidence to suggest that better legal content allows firms to enjoy longer maturity on their loans. Furthermore, the analysis provided no evidence supporting the argument that bank finance maturity has an impact on trade credit maturity. Network effects and opportunistic behaviour in an environment of weak enforcement may explain trade credit maturity.

The results of chapter 2 are taken with caution for several reasons, 2 of which are repeated here. First, the study did not control for other factors that impact access to external finance. Haas (2004) argues that this is a major weakness of the law and finance literature. Factors such as bank supervision, the level of financial development, the level of economic development, political stability, natural endowments and social capital are critically important. These factors

are likely to explain the interesting observation that although contract enforcement costs are highest in Kenya, Kenyan firms still have the most access to external finance. For example, because Kenya has historically enjoyed a higher level of economic development than Uganda and Tanzania, access to external finance will be more favourable for Kenyan firms even if legal enforcement in Kenya is of poor quality. Second, the analysis can not claim that causality runs from legal environment to external finance. It is possible that the superior creditor rights in Kenya are a response to the expansion of the formal credit market, rather than a cause of this expansion.

6.3 The Effect of Collateral and Collateral Substitutes on Access to Bank Finance

Chapter 3 focused specifically on access to bank finance. It investigated how collateral and collateral substitutes affect the likelihood of firms securing loans. It was found that a very high proportion of loans in all the EAC countries are collateralized. The results showed that collateral in the form of machinery and equipment has a significant effect on access to bank loans in Uganda and Tanzania, but not in Kenya. This means that collateral has a role to play in the transmission mechanism in Uganda and Tanzania. In light of the findings in chapter 2, this supports the view that collateral can be effective as a contracting mechanism when enforcement costs are relatively low. It also indicates that secondary markets for machinery and equipment are playing a role in facilitating the role played by collateral. On the other hand, where enforcement costs are very high as is the case in Kenya, collateral appears to be irrelevant.

Notably, the results suggest that in Uganda collateral is more important for the firm decision to apply for loans than for the bank decision to approve these applications. Ugandan firms may be relying on collateral to signal their quality to banks. Firms without collateral are unable to send such a signal and thus are less likely to apply. On the other hand, in Tanzania collateral is key to the banks' decision about whether or not to extend a loan. Tanzanian banks appear to view collateral as a means of addressing information asymmetry.

The results also showed that collateral in the form of real estate does not improve access to bank loans in all 3 countries. This suggests that the legal systems in the EAC countries (and particularly in Uganda and Tanzania) are better suited to transfer machinery and equipment from defaulting borrowers to creditors than they are suited to transferring real estate. It appears that in

the context of SSA, having collateral alone is not enough. The *type* of collateral is also important.

The most important collateral substitute in the EAC appears to be reputation. It is particularly important in Kenya where both real estate *and* machinery and equipment are found to be ineffective as contract enforcement mechanisms. Furthermore, the analysis showed limited evidence supporting the hypothesis that relationship lending can have a positive effect on access to bank finance. However, it does appear that bank-firm relationships have evolved over time. Firms pursue relationships with banks for credit more than in the past. The weak support for relationship banking is consistent with the very limited studies that have been conducted on other developing countries. It indicates that the quality of information available to banks for their lending decisions needs to be enhanced, and that emphasis should be placed on pursuing other avenues of solving information asymmetry that are more relevant to SSA. Nevertheless, it may also point to the limitations the data impose on measuring relationship lending adequately.

6.4 The Legal Environment and Non-Bank Finance: Trade Credit and Leasing Finance

The analysis in chapter 4 was based on the relationship between the legal environment and two sources of external finance that do not depend directly on the collateral mechanism. These are trade credit and leasing finance. The investigation differed from previous works in that it empirically examined how the availability of collateral affects the likelihood that a firm uses trade credit. Although trade credit is not collateralized, it still requires the use of the court system to resolve disputes over payments. Thus, the chapter also examined the extent to which firms use courts to resolve disputes. An environment in which firms are confident that courts will settle disputes effectively is likely to be characterised by a greater supply of trade credit. This chapter investigated whether this is the case.

It was found that high enforcement costs do not deter the use of courts to settle payment disputes associated with trade credit. As was noted in this chapter and in chapter 2, the high enforcement costs observed in Kenya could be the result of the significantly higher trade credit availability relative to Uganda and Tanzania. More trade credit implies more conflicts ending up in court, which places pressure on the judiciary. The use of courts appears to have a positive correlation with the quality of creditor rights. Furthermore, courts are likely to be a more effective deterrent to opportunistic behaviour relative to non-court mechanisms. Tanzania which has the least use of

courts was also found to have the greatest share of sales resulting in overdue payments. In contrast, Uganda which has the most efficient court system among the 3 countries has the least problems with overdue payments. Thus, courts appear to be an effective deterrent to opportunistic behaviour when they function efficiently.

Another contribution of this chapter was to assess the role of business associations in settling trade credit disputes between firms. Previous works have focused more on how informal mechanisms affect trade credit. The analysis showed that business associations can play an important part in resolving disputes over trade credit. Overall, associations are used more than courts to resolve disputes. These associations are of more value when enforcement costs associated with courts are higher.

In the empirical estimation on the impact of collateral on trade credit focus was placed only on Uganda and Tanzania. Some of the reasons for this are repeated here. First, the argument that trade credit reduces credit constraints caused by inadequate collateral led us to focus on these countries where collateral constraints actually exist. Second, a very large proportion of Kenyan firms have access to trade credit. It is Uganda and Tanzania that would benefit from an increase in the availability of this source of finance. Thirdly, Uganda and Tanzania have far less access to short term bank finance (i.e., overdraft facilities) compared to Kenya.

The results showed that collateral has a significant positive effect on the use of trade credit in Uganda. This has the important implication that trade credit is not an effective substitute for bank finance for firms with inadequate collateral. It supports the argument that trade credit and bank finance are complements. It also suggests that collateral may play a role in trade credit arrangements when legal enforcement costs are relatively low. On the other hand, in Tanzania collateral exerts a significant negative effect on trade credit use, implying that trade credit can be a meaningful substitute for bank finance.

The results also showed that Ugandan firms that have confidence in the judiciary supply substantially more trade credit than those that lack such confidence. Ugandan firms can have confidence in the judiciary because in practice recovering overdue debt is less costly than in the other EAC countries. The supply of trade credit also appears to be positively affected by access to bank finance, particularly in the case of Tanzania. This lends support to the 'redistribution

view', and shows that strengthening the legal environment can increase the likelihood that firms unable to access bank finance directly do so indirectly through trade credit.

Much less is known about the use of leasing finance in African manufacturing compared to bank finance and trade credit. To the best knowledge of the author chapter 4 provided the first attempt to examine the relationship between specific measures of the legal environment and leasing finance in the context of African manufacturing firms. The analysis showed that the use of leasing finance in the EAC is minimal. Similar to other studies, the conclusion of this chapter is that leasing is still in its infancy in the EAC. The limited evidence showed that an environment where the rights of lessors are better defined is associated with more leasing. Furthermore, there is more leasing of assets that are not industry specific partly because of the difficulties associated with selling specialized equipment, particularly in thin secondary markets. It was also found that better quality legal content is associated with leasing contracts of longer duration.

6.5 Property Rights, Finance Channels and Investment

Chapter 5 analysed the second part of the 'transmission mechanism' from finance to investment and growth, provided by the legal system. The chapter examined how the legal environment affects the use of financial resources for investment purposes. It focused specifically on the role of property rights. The analysis in this chapter falls under what is referred to in the literature as the investment climate approach. This is an emerging area that uses micro level data to investigate the institutional determinants of firm growth, investment, and productivity in developing countries.

The measures of property rights used in this chapter are the level of confidence that firms have in the judiciary to enforce their property rights in business related disputes, and whether or not firms make unofficial payments to government officials for services required for their operations. The indicators showed that the highest share of firms having confidence in the judiciary is found in Uganda and the lowest in Tanzania. On the other hand Uganda has the highest share of firms that make unofficial payments.

It was argued that the property rights environment needs to be examined in the context of the level of corruption. This is because corruption has a direct bearing on the level of expropriation that government officials can undertake. The analysis showed that corruption is a much more

serious constraint to doing business in Kenya than in Uganda and Tanzania. Uganda has the smallest share of firms who consider corruption to be a significant hindrance to doing business. This finding is supported by the significantly larger share of contract value that Kenyan firms pay as unofficial payments to government officials relative to the other countries. Ugandan firms pay the smallest share of contract value to government officials, meaning that although corruption is highly prevalent its economic magnitude is relatively small.

It was found that firms who have confidence in the judiciary to enforce their property rights are more likely to invest in machinery and equipment in Kenya and Uganda. This effect is statistically significant in Uganda, where as was mentioned, corruption is least serious as an obstacle to conducting business. Thus, the protection of property rights has an important effect on investment in an environment where the costs of corruption are lower. In addition, recall that chapter 2 showed enforcement costs were lowest in Uganda relative to the other 2 countries Therefore, greater efficiency of the judiciary enhances the transmission mechanism. Surprisingly, it was also found that firms who have confidence in the judiciary are less likely to invest in machinery and equipment in Tanzania. While this is contrary to the expectations in this chapter, it is consistent with the relatively high prevalence of corruption in Tanzania and the considerably smaller share of firms who have confidence in the judicial process. The result also suggests the possibility of data problems.

The results also showed that unofficial payments positively affect the likelihood that firms invest in machinery and equipment in all 3 countries, and that this effect is significant for Kenya. This is consistent with the view that corruption can aid firms in bypassing the red tape that slows down business, and agrees with Acemoglu and Verdier (1998) who argue that it may be optimal to allow some corruption rather than stringently enforce property rights. In addition, the results showed how difficult it is to make accurate inferences using perceptions about corruption: Kenyan firms appear to benefit from corruption although a large share of them stated that corruption is an obstacle to doing business.

It was found that access to bank finance significantly increases the likelihood of investment in machinery and equipment in all countries. This shows that a legal environment that improves the flow of funds from banks to firms can have a meaningful impact on economic growth. It also indicates that the credit constraints in Uganda and Tanzania represent a real inability to pursue profitable investment opportunities. Furthermore, the results showed that growth in sales exerts a

significant positive effect on the decision to invest. This means that anticipated increases in demand stimulate investment as predicted by the accelerator theory. It also suggests that firms with more internal finance are better positioned to undertake investment opportunities.

Finally, it was found that larger firms and exporting firms are more likely to invest in machinery and equipment compared to small firms. This indicates that policies aimed at encouraging investment by SMEs in the EAC have not been very successful in the manufacturing sector. The business environment in the EAC continues to favour large firms. The results also suggest that export-led manufacturing has the potential to boost economic growth in these countries.

6.6 Tabular Summary of Key Contributions

This section highlights the key contributions of each analytical chapter in a tabular form. Taken together, these contributions are considered to be an important addition to the existing body of knowledge pertaining to the relationship between legal institutions and finance in the EAC in particular, and SSA in general.

Table 6.1: Key Contributions of Analytical Chapters

Chapter	Key Contributions
Chapter 2	▪ Provided a comprehensive discussion of the legal environment in the EAC using quantitative indicators. ▪ Showed that a negative correlation holds between information asymmetry and the quality of creditor rights in EAC countries.
Chapter 3	▪ Provided empirical evidence showing that collateral is more effective when legal enforcement is more efficient. ▪ Demonstrated empirically that reputation is an effective collateral substitute. ▪ Provided empirical evidence suggesting that the legal environment in the EAC does not adequately facilitate the use of real estate as collateral.
Chapter 4	▪ Demonstrated empirically that firms may use collateral to access trade credit when information asymmetry is high and enforcement costs are low. ▪ Provided empirical evidence showing that firms that have more confidence in the judiciary to enforce their property rights provide more trade credit. This positive effect holds where legal enforcement is efficient. ▪ Provided some tentative evidence on the relationship between leasing and indicators of the legal environment.
Chapter 5	▪ Demonstrated empirically that more secure property rights increases the likelihood that firms will invest. This positive effect holds where legal enforcement is efficient. ▪ Provided empirical evidence showing that corruption can enhance a firms' ability to conduct business by reducing bureaucratic obstacles. This effect only holds where the magnitude of bribes is generally large (Kenya). ▪ Showed that generally, the key determinants of investment decisions in the EAC are property rights, internal and external finance, size, export status, and demand.

6.7 Policy Recommendations and Areas for Further Research

The results of this dissertation have several important implications for policymaking in the EAC. Reforms to improve the effectiveness of the legal system can have a positive effect on access to external finance and on the level of investment. The reforms required are not uniform, though a regional effort to tackle common problems can be effective. Given that the study is based on the institutional environment in the EAC, for policy reforms to succeed, a high level of political will is required. In making the policy recommendations, the experience of other countries that have successfully implemented similar reforms is considered.

A significant finding of this dissertation is that legal content is more highly associated with access to external finance than legal formalism. The implication of this is that policymakers in the EAC in particular, and SSA in general, should place strong emphasis on improving the laws

protecting the rights of creditors. This is especially the case for Tanzania and Uganda where it was found that the protection of creditors is relatively poor. Critical to this process is translating improved creditor rights into better financial information. The nature of interventions used to strengthen creditor rights should focus on improving the quality of information that debtors are obligated to provide to creditors. Furthermore, these countries need to strengthen laws related to the taking of property assigned to another party and selling it in order to pay for financial obligations such as bank loans. This will make collateral even more effective than it currently is.

The cost of enforcement is also important for the functioning of credit markets as it significantly affects the terms of credit. High enforcement costs will not only raise the cost of credit, but also reduce the willingness of creditors to lend. Kenya which has the highest level of legal formalism also has substantially higher collateral requirements being imposed on firms. Finding ways of reducing these costs can have a substantial impact on reducing the cost of credit. Clearly, a starting point is to improve the efficiency of the judiciary. According to the World Bank (2004a), the Kenyan government is currently addressing these issues through the Governance, Justice, Law & Order Sector Programme, which is supported by a large number of donor agencies. In addition, the Doing Business (2005) Report states that out of court measures can be undertaken to reduce enforcement costs in credit markets. These include notarial execution which allows debtors and creditors to agree on enforcement methods as used in Spain, and Debt Recovery Tribunals as used in India. They find that out of court enforcement mechanisms can reduce enforcement time by an average of three-quarters.

It was found that collateral in the form of machinery and equipment has a significant positive effect on access to bank finance in Uganda and Tanzania. Strengthening the collateral mechanism can lead to greater access to bank finance. This may require that property rights over assets are more clearly defined. The evidence from this study indicates that real estate is one asset where creditor rights need strengthening. Furthermore, if firms are pledging real estate where their ownership is difficult to verify, banks will be less willing to lend. Thus, in addition to strengthening creditor rights over real estate, debtor rights over assets in this category should also be strengthened.

The scope of assets legally recognised as collateral can be enhanced. Specifically, debtors should be allowed to make greater use of movable assets. For example, the Doing Business Report (2005) explains that as a part of its collateral law reform undertaken in 2002, Slovakia allowed debtors to use all movable assets (present and future, tangible and intangible) as collateral. Since then more

than 70 percent of all new business credit is secured by movables and receivables, and credit to the private sector has increased by 10 percent.

The results showed that better quality legal protection is associated not only with greater access to bank finance, but also more use of trade credit and leasing finance. At least in the case of trade credit, this is a result in part of bank finance being redistributed to lower quality firms. The implication of this is that specific laws and incentives targeted at stimulating trade credit and leasing finance can be useful in improving access to external finance, particularly in Uganda and Tanzania where firms have less access to bank loans. Factors to consider include laws defining trade credit and leasing finance, the legal protection that the providers of these sources of finance enjoy, and the rights and obligations of creditors and debtors. Policymakers should also take responsibility for setting tax incentives for the suppliers of trade credit and leasing finance, and for raising awareness about the benefits of these sources of finance.

In order for financial resources (whether they are internal or external) to affect economic growth, firms must use these resources to undertake productive investment. More secure property rights are essential for this to happen. Even if non-court enforcement measures are being developed, courts still maintain a critical role. The finding that confidence in the judiciary has a greater impact on investment where the costs of corruption are lower and the courts are more efficient has important policy implications. It suggests that institutional reform meant to stimulate investment must take serious consideration of corruption and the overall efficiency of the judicial system. An efficient judiciary can play an integral part in stimulating business confidence.

It was also found that unofficial payments to government officials are a key part of doing business in the EAC. In the case of Tanzania, weak property rights are also a result of the poor legal content. Consequently, Tanzanian firms have very little confidence in the judiciary to uphold their property rights in the event of business related disputes. This implies that the rights of firms over their investments in machinery, equipment and real estate need to be strengthened. In addition, strong political will is required to reduce corruption by government officials requiring payments to secure contracts and provide services. Such practices are a form of expropriation, reducing the returns accruing to firms from their investments. However, the results and the theoretical arguments in the literature review suggest that completely eliminating corruption may be neither possible nor optimal.

Cost is a critical factor when undertaking reform, especially for countries with limited resources such as those in SSA. An important finding of the Doing Business Report (2005) is that reforms can be undertaken in a cost effective manner with large benefits for economic development. It is suggested that countries in SSA make an effort to learn from other countries which have successfully undertaken similar reforms. This will reduce the chances of failure and accelerate the learning process. With strong political will, useful reforms can be adapted from other regions without having to incur high costs.

Future research can shed more light on collateral by investigating the role it plays as an enforcement mechanism from the perspective of banks. This would include finding out how important banks view collateral to be for their lending, and what types of collateral are most effective. It would also be useful to ascertain the precise factors making real estate less effective as a form of collateral than machinery and equipment.

Furthermore, determining which legal codes are most effective in reducing information asymmetry and how these codes can be implemented across countries can have a meaningful effect on improving access to bank finance. Where data permits, a micro-level comparison between countries of British and non-British origin would provide enlightening evidence on the relationships investigated in this dissertation.

It is interesting that collateral in Uganda positively affects trade credit use. One possible explanation for this is that contrary to what is widely believed, trade credit may actually be collateralised. Future research can focus on investigating this issue in greater detail.

Finally, some of the results may have been compromised by the quality of the data. Gathering additional data and improving the methods of doing so, will provide greater clarity as to whether the manufacturing sector in the EAC is consistent with theory, or whether puzzles requiring deeper investigation exist.

REFERENCES

Abel, A., Dixit, A.K., Eberly, C. and Pindyck, R.S. (1996), "Options, the Value of Capital and Investment," *Quarterly Journal of Economics*, 111, pp753-778.

Acemoglu, D. and Verdier, T. (1998), "Property Rights, Corruption and the Allocation of Talent: a General Equilibrium Approach," *The Economic Journal*, pp1381-1403.

Acemoglu, D. and Johnson, S. (2005), "Unbundling Institutions," *Journal of Political Economy*, 113, pp949-995.

Ai, C. and Norton, E.C. (2003), Interaction Terms in Logit and Probit Models," *Economic Letters*, 80, pp123-129.

Aidt, T.S. (2003), "Economic Analysis of Corruption: A Survey," *The Economic Journal,* 113, F632-F652.

Ang, J. and Peterson, P.P. (1984), "The Leasing Puzzle," *The Journal of Finance*, 39, pp1055-1065.

Ayyagari, M., Beck, T., and Demirguc-Kunt, A. (2003), "Small and Medium Enterprises Across the Globe: A New Database." Research Paper. World Bank, Washington DC.

Bade, J. and Chifamba, R. (1994) ''Transaction Costs and Institutional Environment,'' *The Manufacturing Sector in Zimbabwe: Dynamics and Constraints.* RPED Country Study Series. The World Bank.

Balkenhol, B. and Schütte, H. (2001), "Collateral, Collateral Law and Collateral Substitutes," ILO Social Finance Programme. Working Paper No. 26. International Labour Organization.

Bardhan, P. (1997), "Corruption and Development: A Review of Issues," *Journal of Economic Literature,* 35, pp1320-1346.

Barro, R.J. (1976), "The Loan Market, Collateral, and the Rate of Interest," *Journal of Money, Credit, and Banking*, 8, pp439-456.

Barzel, Y. (1997), Economic Analysis of Property Rights. Cambridge: Cambridge University Press.

Bass, J. and Henderson, K. (2000), "Leasing: A New Option for Micro-Finance Institutions." Technical Note No. 6. Weidemann Associates, Inc.

Beaver, W. (1998), Financial Reporting: An Accounting Revolution. New Jersey: Prentice Hall.

Beck, T., Demirguc-Kunt, A., and Levine, R. (2001), "Law, Politics and Finance." Research Paper. The World Bank.

Beck, T., Demirguc-Kunt, A., and Levine, R. (2003), "Law and Finance: Why Does Legal Origin Matter?" *Journal of Comparative Economics*, 31, pp653-675.

Beck, T., Demirguc-Kunt, A., and Levine, R. (2004), "Law and Firms' Access to Finance." Research Paper. The World Bank..

Beck, T., Demirguc-Kunt, A., and Peria, M.S. (2005), "Reaching Out: Access To and Use of Banking Services Across Countries," Research Paper. The World Bank.

Becker, G.S. (1968), "Crime and Punishment: An Economic Approach," *Journal of Political Economy*, 76, pp169-217.

Becker, G.S. and Stigler, G.J. (1974), "Law Enforcement, Malfeasance and the Compensation of Enforcers," *Journal of Legal Studies*, 3, pp1-19.

Bell, C. (1989) "Credit Markets and Interlinked Transactions," in *Handbook of Development Economics*, ed. J. Behrman, and T. N. Srinivasan. Amsterdam: North Holland.

Benjamin, D.K. (1978), "The Use of Collateral to Enforce Debt Contracts," *Economic Enquiry*, 16, pp333-359.

Berger, A.N. and Udell, G.F., (1995), "Relationship Lending and Lines of Credit in Small Firm Finance," Journal of Business, 68, pp351-381.

Berger, A.N. and Udell, G.F., (1998), "The Economics of Small Business Finance: The Roles of Private Equity and Debt Markets in the Financial Growth Cycle," *Journal of Banking and Finance*, 22, pp613-673.

Berger, A.N. and Udell, G.F., (2002), "Small Business Credit Availability and Relationship Lending: The Importance of Bank Organizational Structure," *The Economic Journal*, 112, F32-F53.

Bernanke, B.S. and Gertler, M. (1990), "Financial Fragility and Economic Performance," *Quarterly Journal of Economics*, 105, pp87-114.

Besanko, D. and Thakor, A.V. (1987), "Collateral and Rationing: Sorting Equilibria in Monopolistic and Competitive Markets," *International Economic Review*, 28, pp671-689.

Bester, H., (1985), "Screening vs. Rationing in Credit Markets with Imperfect Information," *American Economic Review*, 75, pp850-855.

Bester, H. (1987), "The Role of Collateral in Markets with Imperfect Information," *European Economic Review*, 75, pp887-899.

Bester, H. (1994), "The Role of Collateral in a Model of Debt Renegotiation," *Journal of Money, Credit, and Banking*, 26, pp72-86.

Biggs, A., Conning, J., Fafchamps, M., and Srivastava, P., (1996), "Enterprise Finance in Kenya," RPED Case Study Series. World Bank, Washington DC.

Bigsten, A., Collier, P,. Dercon, S., Fafchamps, M., Gauthier, B., Gunning, J., Isaksson, A., Oduro, A., Oostendorp, R., Patillo, C., Soderbom, M., Teal, F., and Zeufack, A. (1999), Investment in Africa's Manufacturing Sector: A Four Country Analysis," *Oxford Bulletin of Economics and Statistics*, 61, pp489-512.

Bigsten, A., Collier, P,. Dercon, S., Fafchamps, M., Gauthier, B., Gunning, J., Oduro, A., Oostendorp, R., Patillo, C., Soderbom, M., Teal, F., and Zeufack, A. (2000), "Contract Flexibility and Dispute Resolution in African Manufacturing," *Journal of Development Studies*, 36, pp1-37.

Bigsten, A., Collier, P,. Dercon, S., Fafchamps, M., Gauthier, B., Gunning, J., Oduro, A., Oostendorp, R., Patillo, C., Soderbom, M., Teal, F., and Zeufack, A. (2003): "Credit Constraints in Manufacturing Enterprises in Africa," *Journal of African Economies*, 12, pp104-125.

Blackburn, K., Bose, N. and Haque, M.E. (2004), "Endogenous Corruption in Economic Development." GEP Research Paper No. 2004/16. University of Nottingham.

Blejer, M.I. and Khan, M.S. (1984), "Government Policy and Private Investment in Developing Countries," *IMF Staff Papers*, 31, pp379-403.

Bly, K. and Wiberg, A. (2003), "The Value of Saving and Financial Intermediaries in Tanzania," Research Report. Department of Economics, Umea University.

Boot, A.W.A. (2000), "Relationship Banking: What Do We Know?" *Journal of Financial Intermediation*, 9, pp7-25.

Boot, A.W.A. and Thakor, A.V. (1994), "Moral Hazard and Secured Lending in an Infinitely Repeated Credit Market Game," *International Economic Review*, 35, pp899-920.

Boot, A.W.A, Thakor, A.V. and Udell, G.F., (1991), "Secured Lending and Default Risk: Equilibrium Analysis and Policy Analysis and Empirical Results," *Economic Journal*, 101, pp458-472.

Boyd, J. and Prescott, E.C. (1986), "Financial Intermediary-Coalitions," *Journal of Economic Theory*, 38, pp211-32.

Brennan, M., Maksimovic, V. and Zechner, J. (1988), "Vendor Financing," *Journal of Finance*, 43, pp1127-1141.

Brownbridge, M. (1998), "The Causes of Financial Distress in Local Banks in Africa and Implications for Prudential Policy. Research Paper No. 132. UNCTAD, Geneva.

Brunetti, A., Kisunko, G. and Weder, B. (1997), "Credibility of Rules and Economic Growth – Evidence from a World Wide Private Sector Survey." *Background Paper for the World Development Report.* Washington DC: The World Bank.

Caggese, A. (2005), "Financing Imperfections and the Investment Decisions of Small Firms." Research Paper. Pompeu Fabra University.

Calomiris, C.W. and Hubbard, R.G. (1991), "Tax Policy, Internal Finance, and Investment: Evidence from the Undistributed Profits Tax of 1936-1937." Mimeo. Columbia University.

Cánovas, H. and Solano, P. (2003), "Bank Relationships: Effects on the Debt Terms of the Small Spanish Firms." EFMA 2003 Helsinki Meetings.

Carpenter, R.E. and Petersen, B.C. (2002), "Is the Growth of Small Firms Constrained by Internal Finance?" *Review of Economics and Statistics*, 84, pp298-309.

Chan, Y.S. and Kanatas, G. (1985), "Asymmetric Valuation and the Role of Collateral in Loan Agreements." *Journal of Money, Credit and Banking*, 17, pp85-95.

Claessens, S. and Laeven, L. (2003), "Financial Development, Property Rights, and Growth," *The Journal of Finance*, 58, pp2401-2436.

Collier, P. and Gunning, J.W. (1999), "Explaining African Economic Performance," *Journal of Economic Literature*, 37, pp64-111.

Conover, W.J. (1980), Practical Non-Parametric Statistics (2nd edition). New Jersey: John Wiley and Sons.

Cristini, M., Moya, R. and Powell, A. (2001), "The Importance of an Effective Legal System for Credit Markets: The Case of Argentina." Research Network Paper No. R-428. Inter-American Development Bank.

Cuevas, C., Fafchamps, M., Hanson, R., Moll, P., Srivastava, P., (1993), "Case Studies of Enterprise Finance in Ghana," RPED Case Study Series. The World Bank.

Cunat, V. (2004), "Trade Credit: Suppliers as Debt Collectors and Insurance Providers." Working Paper. Universitat Pompeu Fabra.

Davidson, R. and MacKinnon, J.G. (1993), Estimation and Inference in Econometrics. New York: Oxford University Press.

Degryse, H., and Van Cayseele, P. (1998), "Relationship Lending Within a Bank-Based System: Evidence from European Small Business Data." Discussion Paper Series DPS 98.16. Katholieke Universiteit Leuven.

Demirguc-Kunt, A. and Maksimovic, V. (1998), "Law, Finance, and Firm Growth," *The Journal of Finance*, 53, pp2107-2137.

Demirguc-Kunt, A. and Maksimovic, V. (2001), "Firms as Financial Intermediaries: Evidence from Trade Credit Data." Working Paper No. 2696. The World Bank.

Diamond, D.W. (1984), "Financial Intermediation and Delegated Monitoring," *Review of Economic Studies*, 51, pp393-414.

Diamond, D.W. (1989), "Reputation Acquisition in Debt Markets," *Journal of Political Economy*, 97, pp828-861.

Diamond, D.W. (1991), "Monitoring and Reputation: The Choice Between Bank Loans and Directly Placed Debt," *Journal of Political Economy*, 99, pp688-721.

Dixit, A. and Pindyk, R.S. (1994), Investment Under Uncertainty. New Jersey: Princeton University Press.

Djankov, S., La Porta, R., Lopez-de-Silanes, F. and Shleifer, A. (2003), "Courts," *Quarterly Journal of Economics*, 118, pp453-517.

Dollar, D., Hallward-Driemeier, M. and Mengistae, T. (2005), "Investment Climate and Firm Performance in Developing Countries," *Economic Development and Cultural Change*, 54, pp1-31.

Dossani, R. and Kenney, M.F. (2002), "Providing Financing for Technology-based SMEs." Background Paper. UNCTAD.

Dubin, J.A. and Rivers, D. (1990), "Selection Bias in Linear Regression, Logit and Probit Models*," Sociological Methods and Research*, 18, pp360-390.

Ehrlich, I. and Lui, F.T. (1999), "Bureaucratic Corruption and Endogenous Economic Growth," *The Journal of Political Economy*, 107, ppS270-S293. Part 2: Symposium on the Economic Analysis of Social Behaviour in Honour of Gary S. Becker.

Eifert, B., Gelb, A., and Ramachandran, V. (2005), "Business Environment and Comparative Advantage in Africa: Evidence from Investment Climate Data." Research Paper. The World Bank.

Eisfeldt, A.L. and Rampini, A.A. (2005), "Leasing, Ability to Repossess and Debt Capacity." Research Paper. Northwestern University.

Eleswarapu, V.R. and Venkataraman, K. (2004), "The Impact of Legal and Political Institutions on Equity Trading Costs: A Cross-Country Analysis." Research Paper. Southern Methodist University.

El-Gamal, M., El-Megharbel, N., and Inanoglu, H. (2000), "Beyond Credit: A Taxonomy of SMEs and Financing Methods for Arab Countries." Research Paper. Rice University.

Emery, G.W. (1984), "A Pure Financial Explanation for Trade Credit," *Journal of Financial and Quantitative Analysis*, 19, pp271-285.

Erden, L. and Holcombe, R.G. (2005), "The Effects of Public Investment on Private Investment in Developing Economies," *Public Finance Review*, 5, pp575-602.

Fabbri, (2001), "The Legal Enforcement of Credit Contracts and the Level of Investment." CSEF Working Paper No. 57.

Fafchamps, M., Biggs, T., Conning, J., and Srivastava, P. (1994), "Enterprise Finance in Kenya," RPED Case Study Series. World Bank, Washington D.C.

Fafchamps, M., Pender, J., and Robinson, E., (1995), "Enterprise Finance in Zimbabwe," RPED Case Study Series. World Bank, Washington D.C.

Fafchamps, M. (1997), "Trade Credit in Zimbabwean Manufacturing," *World Development*, 5, pp795-815.

Fafchamps, M. (1999), "Ethnicity and Credit in African Manufacturing." Research Paper. Stanford University.

Fazzari, S.M., Hubbard, G.R. and Petersen, B.C. (1988), "Financing Constraints and Corporate Investment, *Brooking Papers on Economic Activity*, 1, pp141-195.

Ferris, J.S. (1981), "A Transactions Theory of Trade Credit Use," *Quarterly Journal of Economics*, 94, pp243-270.

Fischer, K. (1990), "Hausbankbeziehungen als Instrument der Bindug zwischen Banken und Unternehmen." Dissertation, University of Bonn. In Harhoff, D. and Korting, T. (1998).

Fisman, R. (2001), "Trade Credit and Productive Efficiency in Developing Countries," *World Development*, 29, pp311-321.

Fisman, R. and Raturi, M. (2000), "Does Competition Encourage Cooperation? Evidence from Trade Credit Relationships." Research Paper. Columbia University.

Fleisig, H.W. (1995), "The Power of Collateral: How Problems in Securing Transactions Limit Private Credit for Movable Property." Note No. 43. The World Bank.

Fleisig, H.W. and de la Pena, N. (2003), "Law, Legal Institutions, and Development: Lessons of the 1990s for Property Rights, Secured Transactions, Business Registration, and Contract Enforcement." Research Paper. The World Bank.

Frank, M.Z. and Maksimovic, V. (2004), "Trade Credit, Collateral, and Adverse Selection," Unpublished Manuscript. University of Maryland.

Gallardo, J. (1999), "Leasing to Support Small Businesses and Microenterprises." Working Paper No. 1857. The World Bank.

Ghura, D. (1999), "Private Investment and Economic Growth: Evidence from Cameroon." mimeo. International Monetary Fund.

Gorton, G. and Winton, A. (2003), "Financial Intermediation." in Constantinides, G.M., Harris, M. and Stulz, R.M. eds., *Handbook of the Economics of Finance (Volume 1A)*. Amsterdam: Elsevier.

Government of Tanzania (2003), The Small and Medium Enterprise Development Policy. Final Draft.

Green, C.J., Kimuyu, P., Manos, R., and Murinde, V. (2002), "How do Small Firms in Developing Countries Raise Capital?" Evidence from a Large-Scale Survey of Kenyan Micro and Small Scale Enterprises." Economic Research Paper No. 02/6. Loughborough University.

Greenbaum, S.I., Kanatas, G. and Venezia, I. (1989), "Equilibrium Loan Pricing under the Bank-Client Relationship," *Journal of Banking and Finance*, 13, pp221-235.

Greene, W.H. (2003), Econometric Analysis, Fifth Edition. New Jersey: Prentice Hall.

Gul, F.A., and Qiu, H. (2002), "Legal Protection, Corporate Governance and Information Asymmetry in Emerging Financial Markets." Research Paper. City University of Hong Kong.

Gunning, J.W. and Pomp, M. (1995), "Growth, Adjustment and Resource Allocation," in Gunning, J.W and Mumbengegwi, C. eds., *The Manufacturing Sector in Zimbabwe: Industrial Change Under Structural Adjustment.* Free University of Amsterdam and University of Zimbabwe mimeo.

Gunning, W. and Mengistae, T. (2001), "Determinants of African Manufacturing Investment: the Microeconomic Evidence," *Journal of African Economies*, 10, AERC Supplement, pp48-80.

Gyimah-Brempong, K. and Traynor, T.L., (1999), "Political Instability, Investment and Economic Growth in Sub-Saharan Africa*," Journal of African Economies*, 8, pp52-86.

Gyimah-Brempong, K. (2002), Corruption, Economic Growth, and Income Inequality in Africa," *Economics and Governance,* 3, pp183-209.

Haas, R. (2004), "Law, Finance, and Growth During Transition: A Survey," *De Economist*, 152, pp375-402.

Habyarimana, J. (2003), "The Benefits of Banking Relationships: Evidence from Uganda's Banking Crisis. Job Market Paper. Harvard University.

Hadjimichael, M.T. and Ghura, D. (1995), "Public Policies and Private Savings and Investment in Sub-Saharan Africa: An Empirical Investigation." IMF Working Paper No. WP/95/19.

Hallward-Driemeier, M., Iarossi, G., and Sokoloff, K. (2002), "Exports and Manufacturing Productivity in East Asia: A Comparative Analysis with Firm-Level Data. Research Paper. The World Bank.

Hallward-Driemeier, M. and Stewart, D. (2004), "How Do Investment Climate Conditions Vary Across Countries, Regions and Types of Firms?" Background Paper Prepared for the World Development Report 2005. The World Bank.

Harding, A., Soderbom, M., Teal, F. (2002), The Tanzanian Manufacturing Enterprise Survey 2002. Centre for the Study of African Economies, University of Oxford.

Harhoff, D. and Korting, T. (1998), "Lending Relationships in Germany – Empirical Evidence from Survey Data," *Journal of Banking and Finance*, 22, pp1317-1353.

Havers, M. (1999), "Microenterprise and Small Business Leasing – Lessons from Pakistan," *Small Enterprise Development Journal*, 10, pp44-51.

Heckman, J.J. (1979), "Sample Selection Bias as a Specification Error," *Econometrica*, 47, pp153-162.

Hendley, K., Murrell, P., and Ryterman, R. (2000), "Law, Relationships and Private Enforcement: Transactional Strategies of Russian Enterprises," *Europe-Asia Studies*, 52, pp627-656.

Hernandez-Cata, E. (2000), "Raising Growth and Investment in Sub-Saharan Africa: What Can Be Done?" *Finance and Development*, 37, pp

Hubbard, R.G., Kashyap, A.K. and Whited, T.M. (1993), Internal Finance and Firm Investment." Working Paper No. 4392. National Bureau of Economic Research.

Huber, P. (1967), "The Behaviour of Maximum Likelihood Estimates under Nonstandard Conditions." In Proceedings of the Fifth Berkeley Symposium in Mathematical Statistics (Vol.1). Berkeley: University of California Press.

International Monetary Fund (2005), Uganda Country Report. IMF, Washington D.C.

Isaksson, A. (2002a), "Access to Formal Finance in Kenyan Manufacturing," SIN Working Paper No.3., UNIDO.

Isaksson, A. (2002b), "The Importance of Informal Finance in Kenyan Manufacturing. SIN Working Paper No. 5., UNIDO.

Japelli, T., Pagano, M., and Bianco, M. (2005), "Courts and Banks: Effects of Judicial Enforcement on Credit Markets*," Journal of Money, Credit, and Banking*, 37, pp223-244.

Jenkins, C. (1998), "Determinants of Private Investment in Zimbabwe," *Journal of African Economies*, 7, pp34-61.

Jimenez, G. and Saurina, J. (2003), "Collateral, Type of Lender and Relationship Banking as Determinants of Credit Risk." Working Paper. Bank of Spain.

Jimenez, G., Salas, V., and Saurina, J. (2006), "Determinants of Collateral," *Journal of Financial Economics*, 81, pp255-281.

Johnson, R. and Bhattacharyya, G. (1986), Statistics: Principles and Methods. New York: John Wiley and Sons.

Johnston, J. and DiNardo, J. (1997), Econometric Methods, Fourth Edition. New York: McGraw-Hill.

Johnson, S., McMillan, J., and Woodruff, C. (2002a), "Courts and Relational Contracts," *The Journal of Law, Economics and Organization*, 18, pp221-277.

Johnson, S., McMillan, J., and Woodruff, C. (2002b), "Property Rights and Finance," *The American Economic Review*, 92, pp1335-1356.

Jorgenson, D. (1963), "Capital Theory and Investment Behaviour," *American Economic Review*, 53, pp247-259.

Kasekende, L and Opondo, H. (2003), "Financing Small and Medium Scale Enterprises (SMEs): Uganda's Experience." Working Paper, Bank of Uganda

Kathuria, V. (2000), "Productivity Spillovers from Technology Transfer to Indian Manufacturing Firms," *Journal of International Development*, 12, pp343-369.

Keefer, S. and Knack, P. (1995), "Institutions and Economic Performance: Cross-Country Tests Using Alternative Measures," *Economics and Politics,* 7, pp207-227.

Keynes, J.M. (1937), The General Theory of Employment, Interest and Money. New York: Harcourt Brace Jovanovich (reprinted).

Kimuyu, P. and Omiti, J. (2000), "Institutional Impediments to Access to Credit by Micro and Small Scale Enterprises in Kenya." Discussion Paper No. 026/2000. Institute of Policy Analysis and Research, Nairobi.

King, R.G. and Levine, R. (1993a), "Finance, Entrepreneurship, and Growth: Theory and Evidence," *Journal of Monetary Economics*, 32, pp513-542.

King, R.G. and Levine, R. (1993b), "Finance and Growth: Schumpeter Might be Right," *Quarterly Journal of Economics*, 108, pp717-738.

Kisaame, J. (2003), "Case Study of DFCU Leasing Company – Uganda." Report. DFCU, Kampala.

Knight, F.H. (1971), Risk, Uncertainty and Profit. Chicago: University of Chicago Press.

Kothari, S.P. (2000), "The Role of Financial Reporting in Reducing Financial Risk in the Market." Conference Series Paper. Federal Reserve Bank of Boston.

Krasa, S., Sharma, T. and Villamil, A.P. (2003), "The Effect of Enforcement on Firm Finance." Research Paper. University of Illinois.

Kreps, D.M. and Wilson, R. (1982), "Reputation and Imperfect Information," *Journal of Economic Theory*, 27, pp253-279.

Kumar, M.S. and Mlambo, K. (1995), "Determinants of Private Investment in Sub-Saharan Africa: An Empirical Investigation." mimeo. International Monetary Fund.

Lasfer, M.A. and Levis, M. (1998), "The Determinants of the Leasing Decision of Small and Large Companies," *European Financial Management*, 4, pp159-184.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., and Vishny, R.W. (1997), "Legal Determinants of External Finance," *The Journal of Finance*, 52, pp1131-1150.

La Porta, R., Lopez-de-Silanes, F., and Shleifer, A. and Vishny, R.W. (1998), "Law and Finance," *Journal of Political Economy*, 106, pp1113-1155.

Leff, N. (1964), "Economic Development Through Bureaucratic Corruption," *American Behavioral Scientist,* 8, pp8-14.

Levine, R. (1998), "The Legal Environment, Banks, and Long-Run Economic Growth," *Journal of Money, Credit, and Banking*, 30, pp598-613.

Levine, R. and Zervos, S. (1998), "Stock Markets, Banks, and Economic Growth," *American Economic Review*, 88, pp537-558.

Levine, R., Loayza, N., and Beck, T. (2000), "Financial Intermediation and Growth: Causality and Causes," *Journal of Monetary Economics*, 46, pp31-77.

Lombardo, D. and Pagano, M. (2002), "Law and Equity Markets: A Simple Model." Working Paper No. 25. Centre for Studies in Economics and Finance.

Love, I., Lorenzo, A.P. and Sarria-Allende, V. (2005), "Trade Credit and Bank Credit: Evidence from Recent Financial Crises." Research Working Paper No. 3716. The World Bank.

Lui, F.T. (1985), "An Equilibrium Queuing Model of Bribery," *Journal of Political Economy,* 93, pp760-781.

Luintel, K.B. and Mavrotas, G. (2005), "Examining Private Investment Heterogeneity." Discussion Paper No. 2005/11. UNU-WIDER.

Manove, M., Padilla, A.J., and Pagano, M. (2001), "Collateral Versus Project Screening: A Model of Lazy Banks," *RAND Journal of Economics*, 4, pp726-744.

Martinelli, C. (1997), "Small Firms, Borrowing Constraints and Reputation," *Journal of Economic Behaviour and Organization*, 33, pp91-105.

Matambalya, F. and Wolf, S. (2001), "The Role of ICT for the Performance of SMEs in East Africa: Empirical Evidence from Kenya and Tanzania." Discussion Paper No. 42. Centre for Development Research, Bonn.

Mauro, P. (1995), "Corruption and Growth," *The Quarterly Journal of Economics*, 110, pp681-712.

Mauro, P. (1997), "The Effects of Corruption on Growth, Investment, and Government Expenditure: A Cross-Country Analysis." *Corruption and the Global Economy.* Washington DC: Institute for International Economics, pp83-107.

Mauro, P. (2004), "The Persistence of Corruption and Slow Economic Growth," *IMF Staff Papers*, 51, pp1-18.

Mayer, C. (1990), "Financial Systems, Corporate Finance and Investment," in G. Hubbard, eds, *Asymmetric Information, Corporate Finance, and Investment*. Chicago: University of Chicago Press.

McArthur, J. and Teal, F. (2002), "Corruption and Firm Performance in Africa." Research Paper. Centre for the Study of African Economies. University of Oxford.

McKee, K. (2004), Financing Development: Banking on Microenterprise. Policy Brief. USAID, Washington D.C.

McMillan, J. and Woodruff, C. (1999), "Dispute Prevention Without Courts in Vietnam," *The Journal of Law, Economics and Organization*, 15, pp637-658.

Meltzer, A.H. (1960), "Mercantile Credit, Monetary Policy, and Size of Firms," *Review of Economics and Statistics*, 42, pp429-437.

Menkhoff, L., Neuberger, D. and Chodechai, S. (2004), "Collateral-Based Lending in Emerging Markets: Evidence from Thailand." Research Paper. University of Rostock.

Mian, S. and Smith, C.W. (1992), "Accounts Recievable Management Policy: Theory and Evidence," *Journal of Finance*, 47, pp169-200.

Miceli. T.J., Sirmans, C.F. and Turnball, G.K. (2001), "The Property-Contract Boundary: An Economic Analysis of Leases," *American Law and Economic Review*, 3, pp165-185.

Mlambo, K. and Oshikoya, T.W. (2001), "Macroeconomic Factors and Investment in Africa," *Journal of African Economies*, 10, AERC Supplement, pp12-47.

Morck, R., Nakamura, M., and Shivdasani, A. (2000), "Banks, Ownership Structure, and Firm Value in Japan," *Journal of Business*, 73, pp539-567.

Mutesasira, L.K., Osinde, S. and Mule, N.R. (2001), "Potential for Leasing Products: Asset Financing for Micro & Small Businesses in Tanzania and Uganda" Research Report. MicroSave-Africa, Kampala.

Myers, S.C. (1984), "The Capital Structure Puzzle," *The Journal of Finance*, 39, pp575-592.

Myers, S.C. and Majluf, N.S. (1984), "Corporate Financing Decisions When Firms Have Investment Information that Investors Do Not," *Journal of Financial Economics*, 13, pp187-220.

Nadiri, M.I. (1969), "The Determinants of Trade Credit in the U.S. Total Manufacturing Sector," *Econometrica*, 37, pp408-423.

Nagarajan, G., and Meyer, R.L. (1998), "Collateral Substitutes: Effect on Loan Access and Size in the Philippine Informal Credit Markets," *Asia Pacific Development Journal*, 5, pp133-145.

Nakatani, I. (1984), "The Economic Role of Financial Corporate Grouping," in Aoki, M. ed., *The Economic Analysis of the Japanese Firm.* North-Holland: Amsterdam.

Nam, S.W. (2004), "Relationship Banking and its Role in Corporate Governance." Research Paper No. 56. Asian Development Bank Institute.

Ndikumana, L. (2000), "Financial Determinants of Domestic Investment in Sub-Saharan Africa: Evidence from Panel Data," *World Development*, 28, pp381-400.

Ndikumana, L. (2001), "Financial Markets and Economic Development in Africa," PERI Working Paper No.17. University of Massachusetts, Amherst.

Ndikumana, L. (2005), "Financial Development, Financial Structure, and Domestic Investment: International Evidence," *Journal of International Money and Finance*, 24, pp651-673.

Nilsen, J.H. (2002), "Trade Credit and the Bank Lending Channel," *Journal of Money, Credit and Banking*, 34, pp226-253.

Nissanke, M. (2001), "Financing Enterprise Development in Sub-Saharan Africa," *Cambridge Journal of Economics*, 25, pp343-367.

Nkurunziza, J.D. (2005a), "The Effect of Credit on Growth and Convergence of Firms in Kenyan Manufacturing," CSAE Working Paper Series, Oxford University.

Nkurunziza, J.D. (2005b), "Reputation and Credit Without Collateral in Africa's Formal Banking," CSAE Working Paper Series, Oxford University.

Norton, S. (1998), "Property, Property Rights, and Human Well-Being: A Cross-National Study," *Cato Journal*, 18, pp233-245.

Norton, E.C., Wang, H. and Ai, C. (2004), "Computing Interaction Effects and Standard Errors in Logit and Probit Models," *The Stata Journal*, 4, pp154-167.

Petersen, M. and Rajan, R. (1994), "The Benefits of Lending Relationships: Evidence from Small Business Data," *Journal of Finance*, 49, pp3-37.

Petersen, M. and Rajan, R. (1997), "Trade Credit: Theories and Evidence," *The Review of Financial Studies*, 10, pp661-691.

Pinheiro, A.C. and Cabral, C. (1999), "Credit Markets in Brazil: The Role of Judicial Enforcement and Other Instituitons." Research Network Paper No. R-368. Inter-American Development Bank.

Phillips, L.M. (2006), "Growth and the Investment Climate: Progress and Challenges for Asian Economies." Paper Prepared for Asia 2015.

Pyle, W. (2005), "Contractual Disputes and the Channels for Interfirm Communication," *The Journal of Law, Economics and Organization*, 21, pp547-575.

Qian, J. and Strahan, P.E. (2005), "How Laws and Institutions Shape Financial Contracts: The Case of Bank Loans." Research Paper. Boston College.

Radelet, S., Sachs, J., and Lee, J. (1997), "Economic Growth in Asia." Background Paper for the Asian Development Bank Study Emerging Asia: Changes and Challenges.

Rajan, R. and Zingales, L. (1995), "What Do We Know About Capital Structure? Some Evidence from International Data," *Journal of Finance*, 50, pp1421-1460.

Rijckeghem, C.V. and Weder, B. (1997), "Corruption and the Rate of Temptation: Do Low Wages in the Civil Service Cause Corruption?" *Working Paper #97/73.*Washington DC: International Monetary Fund.

Rodriguez-Meza, J (2004), "Debt Enhancement Policies," Research Paper, The Ohio State University.

Schwartz, R.A. (1974), "An Economic Model of Trade Credit," *Journal of Financial and Quantitative Analysis*," 9, pp643-657.

Serven, L. (1997), "Uncertainty, Instability, and Irreversible Investment: Theory, Evidence and Lessons for Africa." Working Paper No. 1722. The World Bank.

Sharpe, S.A. (1990), "Asymmetric Information, Bank Lending, and Implicit Contract: A Stylized Model of Customer Relationships," *Journal of Finance*, 45, pp1069-1087.

Shleifer, A. and Vishny, R.W. (1994), "Politicians and Firms," *Quarterly Journal of Economics,* 109, pp995-1026.

Shvets, J. (2006), "Law Enforcement and Firms' External Finance: Evidence from Russian Commercial Courts." Research Paper. University of Cambridge.

Siegel, S. and Castellan Jr, N.J. (1988), Non-Parametric Statistics for the Behavioral Sciences (2nd edition). Ohio: McGraw-Hill.

Smith, J. (1987), "Trade Credit and Information Asymmetry," *Journal of Finance*, 42, pp863-872.

Smith, W. and Hallward-Driemeier, M. (2005), Understanding the Investment Climate," *Finance and Development* (March), pp40-43.

Stata Corporation, Stata Base Reference Manual (Volume 3). Texas: Stata Press.

Stiglitz, J. and Weiss, A. (1981), "Credit Rationing in Markets with Incomplete Information," *American Economic Review*, 71(3), pp393-410.

Tadelis, S. (1999), "What's in a Name? Reputation as a Tradable Asset," *American Economic Review*, 89, pp548-563.

Timner, M.P. and Szirmai, A. (1997), "Growth and Divergence in Manufacturing Performance in South and East Asia." Research Paper No. 37. Institute of Economic Research, Groningen University.

Tobin, J. (1969), "A General Equilibrium Approach to Monetary Theory," *Journal of Money, Credit and Banking*, 1, pp15-29.

Treisman, D. (2000), "The Causes of Corruption: A Cross-National Study," *Journal of Public Economics,* 76, pp399-457.

UNIDO (1999), Financing of Private Enterprise Development in Africa: Financing of SMEs in Africa. Background Paper. UNIDO, Vienna.

van Biersebroeck (2005), "Firm Size Matters: Growth and Productivity Growth in African Manufacturing," *Economic Development and Cultural Change*, 53, pp545-583.

Watts, R. and Zimmerman, J. (1986), Positive Accounting Theory. New Jersey: Prentice Hall.

Weinstein, D.E. and Yafeh, Y. (1995), "Japan's Corporate Groups: Collusive or Competitive? An Empirical Investigation of Keiretsu Behaviour," *Journal of Industrial Economics*, 43, pp359-376.

Weinstein, D.E. and Yafeh, Y. (1998), "On the Cost of a Bank-Centred Financial System: Evidence from the Changing Main Bank Relations in Japan," *Journal of Finance*, 53, pp635-672.

Westley, G.D. (2003), "Equipment Leasing and Lending: A Guide for Mircofinance." Sustainable Development Best Practice Series. Inter-American Development Bank.

White, H. (1980), "A Heteroscedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroscedasticity," *Econometrica*, 48, pp817-838.

White, H. (1982), "Maximum Likelihood Estimation of Misspecified Models," *Econometrica*, 53, pp1-16.

Wilson, N., Summers, B. and Singleton, C. (1997), "Small Business Demand for Trade Credit, Credit Rationing and the Late Payment of Commercial Debt: An Empirical Study." Research Paper. University of Bradford.

World Bank (2004a), Enhancing the Competitiveness of Kenya's Manufacturing Sector: The Role of the Investment Climate. RPED, The World Bank.

World Bank (2004b), Competing in the Global Economy: An Investment Climate Assessment for Uganda. RPED, The World Bank.

World Bank (2004c), Investment Climate Assessment: Improving Enterprise Performance and Growth in Tanzania. RPED, The World Bank.

World Bank (2005), World Development Indicators.

World Bank (2005), Doing Business in 2005: Removing Obstacles to Growth.

Ziane, Y. (2004), "An Investigation into the Determinants of Trade Credit Use by French Small and Medium Enterprises." Research Paper. University of Paris X-Nanterre.

Websites

Bank of Tanzania, www.bot-tz.org

Bank of Uganda, www.bou.or.ug

Central Bank of Kenya, www.centralbank.go.ke

International Monetary Fund, www.imf.org

Tanzania National Website, www.tanzania.go.tz

World Bank, www.worldbank.org

APPENDICES

Appendix 1: Correlation Matrix of Variables Used in Chapter 3

Kenya Variable	Loan	Log of Replacement Value of Machinery and Equipment	Log of Replacement Value of Real Estate	Share of Machinery and Equipment>10 years old	Log of Firm Age	Log of Length of Relation-ship	Log of Employment	Audited Accounts	Profitability	Local Banks	Local Ownership	African	Education Level of Manager
Loan	1.00												
Log of Replacement Value of Machinery and Equipment	0.14	1.00											
Log of Replacement Value of Real Estate	-0.04	0.59	1.00										
Share of Machinery and Equipment>10 years old	-0.09	-0.11	-0.07	1.00									
Log of Firm Age	-0.31	0.05	0.09	0.33	1.00								
Log of Length of Relationship	-0.20	-0.07	0.01	0.24	0.49	1.00							
Log of Employment	-0.26	0.69	0.62	-0.31	-0.18	-0.16	1.00						
Audited Accounts	-0.06	-0.08	-0.16	0.09	0.08	0.00	-0.08	1.00					
Profitability	0.17	0.21	0.18	-0.22	-0.05	-0.06	0.49	-0.17	1.00				
Local Banks	0.12	0.10	-0.02	-0.04	-0.25	-0.52	0.16	-0.23	0.10	1.00			
Local Ownership	0.08	-0.10	-0.06	-0.10	-0.13	-0.02	-0.03	0.09	-0.06	-0.14	1.00		
African	0.06	-0.19	-0.19	-0.01	-0.17	-0.11	-0.06	0.08	0.11	-0.16	-0.05	1.00	
Education Level of Manager	0.18	0.24	0.20	-0.16	-0.11	-0.22	0.31	-0.04	0.16	0.14	0.08	0.11	1.00

Source: Author's Computations

Uganda Variable	Loan	Log of Replacement Value of Machinery and Equipment	Log of Replacement Value of Real Estate	Share of Machinery and Equipment>10 years old	Log of Firm Age	Log of Length of Relation-ship	Log of Employment	Audited Accounts	Profitability	Local Banks	Local Ownership	African	Education Level of Manager
Loan	1.00												
Log of Replacement Value of Machinery and Equipment	0.40	1.00											
Log of Replacement Value of Real Estate	0.33	0.72	1.00										
Share of Machinery and Equipment>10 years old	-0.02	0.33	0.18	1.00									
Log of Firm Age	0.23	0.47	0.47	0.42	1.00								
Log of Length of Relationship	0.23	0.29	0.30	0.08	0.42	1.00							
Log of Employment	0.47	0.71	0.68	0.25	0.58	0.34	1.00						
Audited Accounts	0.27	0.62	0.70	0.10	0.42	0.27	0.67	1.00					
Profitability	-0.08	-0.34	0.15	-0.09	-0.09	0.01	0.08	0.12	1.00				
Local Banks	0.01	-0.11	-0.26	0.18	-0.16	-0.12	-0.19	-0.25	-0.12	1.00			
Local Ownership	-0.28	-0.43	-0.48	-0.23	-0.23	-0.12	-0.55	-0.38	-0.14	0.17	1.00		
African	-0.16	-0.57	-0.57	-0.21	-0.29	-0.15	-0.55	-0.48	-0.10	0.21	0.60	1.00	
Education Level of Manager	0.24	0.48	0.50	0.20	0.35	0.11	0.48	0.32	0.07	-0.04	0.38	-0.39	1.00

Source: Author's Computations

Tanzania Variable	Loan	Log of Replacement Value of Machinery and Equipment	Log of Replacement Value of Real Estate	Share of Machinery and Equipment> 10 years old	Log of Firm Age	Log of Length of Relationship	Log of Employment	Audited Accounts	Profitability	Local Banks	Local Ownership	African	Education Level of Manager
Loan	1.00												
Log of Replacement Value of Machinery and Equipment	0.43	1.00											
Log of Replacement Value of Real Estate	0.26	0.67	1.00										
Share of Machinery and Equipment>10 years old	-0.34	-0.09	-0.02	1.00									
Log of Firm Age	-0.18	0.07	0.22	0.37	1.00								
Log of Length of Relationship	-0.24	-0.08	-0.01	0.12	0.28	1.00							
Log of Employment	0.37	0.71	0.65	-0.15	0.12	-0.15	1.00						
Audited Accounts	0.19	0.43	0.36	0.10	-0.08	-0.16	0.26	1.00					
Profitability	-0.07	-0.24	0.15	-0.08	0.11	0.12	0.02	0.02	1.00				
Local Banks	-0.12	-0.29	-0.39	0.08	-0.05	0.29	-0.44	-0.27	-0.11	1.00			
Local Ownership	0.01	0.22	0.18	0.09	0.28	0.05	0.16	0.13	-0.05	-0.03	1.00		
African	-0.13	-0.26	-0.27	0.16	0.01	0.01	-0.27	-0.28	-0.09	0.36	0.15	1.00	
Education Level of Manager	0.27	0.50	0.49	-0.02	0.01	-0.05	0.45	0.32	0.09	-0.18	0.13	-0.16	1.00

Source: Author's Computations

Appendix 2: Correlation Matrix of Variables Used in Chapter 4

Uganda

Variable	Receive Trade Credit	Supply Trade Credit	Log of Replacement Value of Machinery and Equipment	Confidence in Judiciary	Loan	Log of Firm Age	Log of Employment	Audited Accounts	Local Ownership	African	Education Level of Manager
Receive Trade Credit	1.00										
Supply Trade Credit	0.36	1.00									
Log of Replacement Value of Machinery and Equipment	0.42	0.36	1.00								
Confidence in Judiciary	0.02	0.19	0.23	1.00							
Loan	0.24	0.12	0.40	-0.01	1.00						
Log of Firm Age	0.03	0.10	0.19	-0.01	0.15	1.00					
Log of Employment	0.30	0.21	0.69	0.04	0.41	0.35	1.00				
Audited Accounts	0.33	0.41	0.67	0.16	0.26	0.23	0.60	1.00			
Local Ownership	-0.30	-0.20	-0.36	-0.06	-0.27	0.03	-0.47	-0.36	1.00		
African	-0.16	-0.22	-0.47	-0.08	-0.24	-0.11	-0.47	-0.48	0.56	1.00	
Education Level of Manager	0.27	0.23	0.53	-0.04	0.23	0.02	0.46	0.43	-0.40	-0.45	1.00

Source: Author's Computations

Tanzania

Variable	Receive Trade Credit	Supply Trade Credit	Log of Replacement Value of Machinery and Equipment	Confidence in Judiciary	Loan	Log of Firm Age	Log of Employment	Audited Accounts	Local Ownership	African	Education Level of Manager
Receive Trade Credit	1.00										
Supply Trade Credit	0.11	1.00									
Log of Replacement Value of Machinery and Equipment	0.20	0.23	1.00								
Confidence in Judiciary	0.00	-0.02	0.11	1.00							
Loan	0.13	0.17	0.35	0.22	1.00						
Log of Firm Age	-0.03	0.09	0.08	0.05	-0.14	1.00					
Log of Employment	0.35	0.22	0.66	0.05	0.36	0.01	1.00				
Audited Accounts	0.18	0.33	0.60	0.09	0.19	0.10	0.39	1.00			
Local Ownership	0.08	0.08	0.13	0.16	0.08	0.18	0.08	0.09	1.00		
African	-0.20	-0.12	-0.27	0.03	-0.08	-0.14	-0.26	-0.40	0.10	1.00	
Education Level of Manager	0.24	0.20	0.57	0.03	0.30	0.02	0.56	0.43	0.06	-0.20	1.00

Source: Author's Computations

Appendix 3: Correlation Matrix of Variables Used in Chapter 5

Kenya

Variable	Invest in Machinery and Equipment	Confidence in Judiciary	Unofficial Payments	Loan	Log of Firm Age	Log of Employment	Local Ownership	Exporter	Inflation Expectations	Growth in Sales	Infrastructure
Invest in Machinery and Equipment	1.00										
Confidence in Judiciary	0.11	1.00									
Unofficial Payments	-0.02	-0.15	1.00								
Loan	0.10	-0.07	-0.01	1.00							
Log of Firm Age	0.01	-0.09	-0.08	-0.14	1.00						
Log of Employment	0.36	0.09	-0.10	0.07	0.14	1.00					
Local Ownership	-0.04	-0.17	0.06	0.17	-0.24	-0.25	1.00				
Exporter	0.21	-0.05	-0.08	0.08	0.06	0.27	-0.04	1.00			
Inflation Expectations	-0.09	0.07	0.14	-0.04	-0.02	0.09	-0.04	0.11	1.00		
Growth in Sales	0.22	0.09	-0.12	0.06	-0.19	0.06	0.02	-0.02	0.03	1.00	
Infrastructure	0.07	0.08	-0.03	-0.18	0.25	-0.06	-0.02	-0.12	-0.12	-0.07	1.00

Source: Author's Computations

Uganda

Variable	Invest in Machinery and Equipment	Confidence in Judiciary	Unofficial Payments	Loan	Log of Firm Age	Log of Employment	Local Ownership	Exporter	Inflation Expectations	Growth in Sales	Infrastructure
Invest in Machinery and Equipment	1.00										
Confidence in Judiciary	0.22	1.00									
Unofficial Payments	0.01	-0.02	1.00								
Loan	0.33	0.09	-0.15	1.00							
Log of Firm Age	0.25	0.15	-0.16	0.12	1.00						
Log of Employment	0.36	0.08	-0.10	0.38	0.55	1.00					
Local Ownership	-0.22	-0.04	0.06	-0.16	-0.45	-0.62	1.00				
Exporter	0.40	0.15	0.10	0.26	0.36	0.54	-0.39	1.00			
Inflation Expectations	0.12	-0.13	0.15	0.08	0.01	-0.04	0.15	0.02	1.00		
Growth in Sales	0.18	-0.02	-0.00	0.27	-0.04	0.11	0.04	0.17	0.08	1.00	
Infrastructure	-0.08	0.09	0.19	-0.21	-0.01	-0.12	0.16	-0.07	-0.10	0.02	1.00

Source: Author's Computations

Tanzania

Variable	Invest in Machinery and Equipment	Confidence in Judiciary	Unofficial Payments	Loan	Log of Firm Age	Log of Employment	Local Ownership	Exporter	Inflation Expectations	Growth in Sales	Infrastructure
Invest in Machinery and Equipment	1.00										
Confidence in Judiciary	-0.15	1.00									
Unofficial Payments	0.17	-0.09	1.00								
Loan	0.30	0.26	0.13	1.00							
Log of Firm Age	-0.10	0.05	-0.15	-0.25	1.00						
Log of Employment	0.40	0.11	0.14	0.37	-0.06	1.00					
Local Ownership	0.00	0.10	-0.08	0.10	0.09	0.14	1.00				
Exporter	0.31	0.06	0.12	0.21	-0.03	0.50	0.12	1.00			
Inflation Expectations	0.05	-0.05	0.14	-0.01	0.06	0.16	0.20	0.19	1.00		
Growth in Sales	0.16	-0.07	-0.04	-0.00	0.04	0.05	-0.09	-0.04	-0.10	1.00	
Infrastructure	-0.04	-0.13	0.09	0.05	-0.13	0.04	0.04	0.07	0.11	-0.52	1.00

Source: Author's Computations

Appendix 4: Alternative Interaction Effects of Transmission Mechanism Discussed in Chapter 5

The author calculated the alternative interaction effects which Ai and Norton (2003) and Norton et al (2004) say mitigate the sign problem. The results are reported in Table A4 below with the corresponding z-statistics reported in parentheses. The minimum and maximum values of the interaction effects are also given. The sign on the average effects are generally not different from what obtains in Tables 5.7, 5.8 and 5.9. In the case of Uganda, the Z-statistics are fairly similar. In the case of Tanzania, the Z-statistics for interactions 2 and 3 are different. Interaction 2's effect in the case of Kenya illustrates some points about the sign problem, which this alternative methodology is meant to address. Whereas the conventional approach gives a positive sign, a negative sign in Table A4 for Kenya is observed.

Table A4: Alternative Interaction Effects

	Interaction 1	Min	Max	Interaction 2	Min	Max	Interaction 3	Min	Max
Kenya	-			-0.252 (-0.593)	-0.709	0.773	-0.791 (-1.23)	-1.794	0.780
Uganda	-0.476 (-1.79)	-0.506	0	-0.621 (-2.07)	-0.838	-0.046	0.323 (-1.626)	-0.424	0.011
Tanzania	-0.082 (-0.360)	-0.182	0.197	0.336 (0.160)	-0.077	1.667	0.661 (1.634)	-0.096	1.014

It is interesting to note that the minimum and maximum values of the interaction effects can exhibit a fairly wide range of positive and negative values depending on the predicted probability that a firm invests. For example, interaction 1 values range from -0.182 to 0.197 in the case of Tanzania, while interaction 3 values range from -1.79 to 0.78 in the case of Kenya. Notably, for Uganda the maximum effect is not significantly different from 0 in all cases, strengthening findings that the interaction effects for this country come out negative.

Using the alternative interaction terms estimation method proposed by Ai and Norton (2003) and Norton et al (2004) has not provided better directional support for the assertion that the variables in the transmission mechanism interact to improve the likelihood that firms will invest. Generally, the interaction terms have taken on positive as well as negative values as these authors showed. The persistent negative sign for the first two interaction terms in the case of Uganda is not in accord with the hypothesized expectations and none of its interaction values has a positive sign[38]. Thus, the technique presented in Table 5.10 is considered as more informative for the analysis; it yields results consistent with the relationships found in the transmission mechanism.

[38] Ai and Norton (2003, pp. 126-128) show that though an interaction term (mean interaction effects) may be negative, for instance, the interaction effects usually vary from negatives to positives across observations. Moreover, they show that as functions of predicted probability, few positive (or negative) interaction effects usually have high and significant t-statistics the further their predicted probabilities are from 0.50 (Figure 1, p. 127). Surprisingly, the interaction effects' ranges of Interactions 1 and 2 for the Ugandan data include no positive values. For Kenya interaction 1 was dropped due to the underidentification problem.