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ACCESS TO FORMAL FINANCE IN KENYAN MANUFACTURING

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Abstract: The descriptive analysis in this paper shows that access to short- and long-term formal credit has decreased in Kenya in spite of important financial reforms. The required collateral is often several times the borrowed amount. However, whether security is asked for to some degree appears to depend on the ability to offer it. Multivariate analysis reveals that factors affecting the credit decision include firm status, firm size, ethnicity, the ability to pledge collateral, and to some extent the proximity between lenders and borrowers. The results suggest that dominating segments of the manufacturing sector, namely small firms, do not receive the much needed financial support necessary to enable manufacturing growth.

1. Introduction

It is known from economic development in OECD countries and the newly industrialised economies in East Asia that until a certain stage of maturity is reached, growth is driven largely by industrialisation. In most other countries as well, the need for a buoyant manufacturing sector is acknowledged to be an important means to increase overall welfare. But industrial development alone is not simply a matter of production processes; it is also a matter of a well-functioning financial sector.[1]

Why finance? Because it is a way to invest in real capital, to smooth expense- and income flows, and to externally finance working capital. Financial intermediation is not the only way to meet these needs, but since in Sub-Saharan African (SSA) countries there is no real possibility to finance investments through the stock market, "traditional" bank financing is called upon to provide this service. If factors like information asymmetry, an inefficient legal system unable to assist in contract enforcement and an unstable macroeconomic environment effectively hinder efficient financial intermediation, it follows that industrial-sector growth and overall economic development are compromised.[2]

Most SSA-countries entertained the idea that active government participation was needed for optimal credit allocation. This is why government intervention is still more of a rule than an exception, although financial-sector reform, with goals such as improved credit allocation to support private-sector development, and a more market-oriented view altogether, has reduced the scope of such participation.

Kenya provides an interesting example of the interplay between enterprise finance and industrialisation. The country has a goal of dramatically reducing poverty by means of industrialisation and rapid growth (Republic of Kenya, 1996) and the role of finance cannot be underestimated in achieving those goals. Kenya, it should be noted, has one of the most sophisticated financial systems in SSA.

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[1] There is ample evidence, at the aggregate level, that financial-sector development is an integral part of, and possibly also causes, economic growth (e.g. Beck and Levine, 2001; Rousseau and Wachtel, 2000; King and Levine, 1993a, b). However, it is not financial development *per se* that causes growth, it is its services to the rest of the economy (e.g. industry) that are growth-promoting. The more efficiently the financial system works, the better the rest of the economy can function.

[2] Steel and Webster (1991) argue that, among other things, lack of access to external finance can explain why it takes so much time for manufacturing exports to catch up with the opportunities provided by relative price changes that favour of international competitiveness. This, in turn, provides an explanation for the slow structural adjustment often witnessed in the region. Collier and Gunning (1999) describe how financial issues, in general, are related to economic performance in Africa.

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In a "friction-less" world (i.e. one without asymmetric information and transaction costs) financial intermediation is not problematic and therefore the question of distinguishing between "good" and "bad" borrowers does not arise. All that matters then is whether a project is profitable or not. However, in reality, frictions prevail and lenders need to collect information about potential borrowers. Information being costly, it may be assumed that lenders try to minimise the costs involved in information-gathering. One way to minimise those costs is to use rules of thumb. For instance, lenders could assume that the size of the firm says something about the creditworthiness of borrowers. In addition to size, economic theory suggests plenty of other factors that may influence the lenders' and borrowers' willingness to sign and comply with a loan contract. If financial intermediation is to be improved, it is necessary to understand which of these factors are actually at play.

This paper investigates the determinants of access to formal short- and long-term finance. The starting point is a theoretical model that represents the circumstances under which a loan contract is agreed upon, and the possible factors which might influence such an agreement. In standard fashion, the model presumes that there are significant transaction costs involved and that these costs are associated with asymmetric information about the borrower, monitoring problems, and imperfect enforcement mechanisms. The regression analysis draws from the theoretical model and tries to assess the importance of factors that have to do with the type of borrower, the ability to pledge collateral, the borrower's reputation, and demand for the borrower's products, among other factors.

A brief survey of previous work, relevant to SSA countries, discloses that the main result of Biggs et al (1996), based on one year of Kenyan micro data, is that access to formal borrowing increases with firm size. Fafchamps, Pender, and Robinson (1995) and Cuevas et al (1993) obtain similar results for Zimbabwe and Ghana, respectively. Bigsten et al (2001), using an innovative approach, cover six SSA countries and show that firm size and a higher debt-ratio positively affect the probability of obtaining formal credit. They also find that state-owned companies and companies with a single owner receive less external credit than do other firms. Finally, Fafchamps (2000) obtains the result that firm size and network effects are important factors for accessing formal credit. He also finds that the ethnic origin of the owner is of no relevance to the lender's credit decision — a result that is disputed in this paper.

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The empirical analysis of this paper is based on a three-year panel dataset collected between 1993-95, which consists of more than 200 Kenyan manufacturing firms. The time dimension of the dataset gives an advantage over the previous research mentioned above — the sole exception being the study by Bigsten et al (2001) — which were based on a cross-section of firms only. A snapshot (one year) approach appears insufficient when analysing a rapidly changing environment. Compared with Bigsten et al (2001), it is the author's conviction that the present study provides a more detailed analysis in the sense that the explanatory variables in the multivariate analysis better reflect the many suggestions of influential factors of credit market behaviour provided by economic theory. The disadvantage, of course, is that only one country is being covered, but it is this factor that allows for a more detailed analysis.[3]

The descriptive analysis indicates that access to formal finance varies across firms. Firm status, firm size, and ethnic origin of the owner affect interest rates charged, how much collateral is required, and how the debt portfolio is composed. Results from regression analysis provide further support for the notion that borrower properties are important to the lending decision. For instance, firm status and ethnicity matter for the lenders' credit decision. Other variables pointed to are firm size and the proximity between lenders and borrowers. The ability to pledge collateral turns out to be an important factor, while the negative parameter of profitability suggests that internal resources are preferred to external ones. Yet another outcome is that financial liberalisation appears not to have increased credit supply to manufacturing firms.

The rest of the paper is organised as follows: Section Two presents a general model based on the theory of contracts, which illustrates under what conditions contracts are established and what factors may be involved. The data are described in Section Three. Thereafter, the Section provides information on Kenyan firms' debt portfolios, collateral and interest rates as well as the perceived access and cost of formal-sector borrowing. In Section Four, results from the multivariate analysis are discussed. Section Five concludes the paper.

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[3] Although all six countries covered in Bigsten et al (2001) were part of the same World Bank project, the questions asked were not identical across the countries. As a consequence, only information available for all countries is included in the six-country dataset.

2. Theory

The concepts of imperfect information and contract enforcement are central to the subject dwelled on here. Due to asymmetric information, lenders are willing to expend real resources on the acquisition of information. Therefore, imperfect information can explain the type of contract and credit rationing, as well as transaction costs associated with monitoring and screening (Williamson, 1985). Because of asymmetric information, a lender uses information on the type of borrowers. From this results an action with several outcomes, for instance, signalling and discrimination.[4] Furthermore, Jensen and Meckling (1976) and Myers (1984) argue that internal resources may be preferred to external finance due to information, agency, and transaction costs.

Under certain circumstances, collateral can substitute for information. This can occur when the legal system works properly, the value of collateral is sufficient, and this value can be preserved over time. When these conditions are fulfilled, the type of borrower is no longer of interest to the lender. Because of the collateral, the borrower will not breach the contract. However, insufficient collateral immediately brings back the issue of asymmetric information.

The second concept, contract enforcement, is of considerable importance for the contract itself. Enforcement can take several forms of which one is legal action. It works when the legal system functions efficiently, but even then, seizing and selling collateral is costly. When the legal system cannot play its role efficiently, other forms apply. These include stopping the relationship (e.g. see Cole, 1998), harassing (Bülow and Rogoff (1989) provide an example in the case of sovereign lending, but the idea is applicable here too), threatening to tell other lenders about the non-compliance with the contract (reputation), or acting illegally.

The present section outlines a simple general model, which is based on the above-mentioned concepts. The model consists of two parties and provides information of when a contract is agreed upon and of what kind of factors may influence the parties during negotiation. The modelling exercise is expected to

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[4] Signalling refers to the costly acquisition of an inherently meaningless characteristic. Discrimination can be with respect to religion, race, sex, and firm size as well as to many other characteristics.

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provide useful guidance towards selecting explanatory variables for the empirical work in Section Four.[5]

2.1 The model

Consider two time periods, 1 and 2. The lender promises to extend a loan L in time 1 in exchange for repayment R of money in time 2. At time 2, the borrower decides whether or not he will comply with the contract, where the decision is assumed to vary with the type of borrower (e.g. skilled versus unskilled, good reputation versus bad reputation, small versus large firm, and so forth).

The cost to the borrower to deliver R can be written as π $(-R, T, \varepsilon)$, where T denotes the type of borrower and ε symbolises the state of nature at time 2.[6] Type $T \in$ Δ is any characteristic of the borrower relevant to the contracting situation (e.g. skill, honesty, firm size, or firm age). The state of nature, $\varepsilon \in \Phi$, refers to anything exogenous and unknown to the parties at time 1 that may influence compliance. If there is an unexpected event, the ability to comply depends on T. Information asymmetries are assumed to be as follows: Δ and Φ are common knowledge, but only the borrower knows his type T.

In the next step, punishment in the case of breach of contract is incorporated, which for the borrower means that instead of receiving a payoff he receives punishment. It is assumed that punishment comes in four ways: guilt, coercion, the end of the business relation, and loss of reputation. Guilt comes at a cost of G (T, ε), while coercion implies the cost K (T, ε, C). The other two parts of punishment are based on repeated interaction, namely, the suspension of future trade resulting in the expected loss $ExpL$ (ε, T), and damaged reputation, with an expected negative effect on the borrower's dealings with other lenders $ExpO$ (ε, T). These two terms refer to the expected discounted value of future transactions with a given lender and with other lenders, respectively.

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[5] It is essential to note that the model and the accompanying discussion to an overwhelming extent are based on Fafchamps, Pender, and Robinson (1995). Other excellent sources of such models are Hart (1995), Hart and Holmström (1987) and Kreps (1990). Wonderful applications on the thematic spirit of contract theory for the case of developing countries are found in Bardhan and Udry (1999) and Ray (1998), where simplicity is combined with a high degree of relevance.

[6] Equivalently, it may symbolise the cost of compliance with the contract.

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Borrowers with little guilt incur low G (T, ε); borrowers hard to coerce have low K (T, ε, C); borrowers with no interest in preserving their relationship with the lender or their reputation, respectively, have low $ExpL$ (ε, T) and $ExpO$ (ε, T). Also, if the cost of legal or illegal proceedings is high relative to the value of the loan, the threat to sue has low credibility and K (T, ε, C) is low.

As long as the cost of compliance is smaller than the sum of penalties, the borrower will fulfil the contract[7]

$$G \ (T, \ \varepsilon) + K \ (T, \ \varepsilon, \ C) + ExpL \ (\varepsilon, \ T) + ExpO \ (\varepsilon, \ T) \geq \pi \ (-R, \ T, \ \varepsilon). \tag{1}$$

Next the condition for the lender to enter the contract is investigated. Let π $(-R)$ and π $(-L)$ be the value of R and L to the lender. At time 1, there are gains from loan extension if π $(-L)$ > π $(-R)$. The lender forms beliefs of the likelihood of being paid, i.e. that (1) will be satisfied. To evaluate this probability, the lender uses all available information Σ at time 1. The information available is the distribution of potential borrower types, information gathered from previous interactions with the borrower, and information obtained from others about the client. Let Z $(T, \ \varepsilon/\Sigma)$ be the joint cumulative distribution over T and ε that captures the lender's beliefs given information Σ.

Since it is easier to fulfil the contract in good states, states of the world are ranked such that, for any client type T, π $(-R, \ T, \ \varepsilon)$ is decreasing in ε. Also assume that each of the four penalties considered in (1) is non-decreasing in ε, which means that the client has more to lose in good than in bad states. Then the function s (T) can be defined as the level of shock ε at which (1) is exactly satisfied and the client T is just indifferent between compliance and breach. That is, s $(T) = \varepsilon^*$ such that

$$\pi \ (-R, \ T, \ \varepsilon^*) = G \ (T, \ \varepsilon^*) + K \ (T, \ \varepsilon^*, \ C) + ExpL \ (\varepsilon^*, \ T) + ExpO \ (\varepsilon^*, \ T). \tag{2}$$

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[7] When π $(-R, \ T, \ \varepsilon) = \infty$, the borrower cannot comply and the contract is breached. If π $(-R, \ T, \ \varepsilon) < \infty$, the borrower could in theory comply, but equation (1) will not be satisfied. The borrower is able, but unwilling to pay.

For any shock above s (T), the borrower pays, and for any shock below s (T), there is no payment at all.[8] Let $(\underline{\varepsilon},\overline{\varepsilon})$ and $(\underline{T},\overline{T})$ be the lowest and highest values that ε and T can take. A rational lender would then agree to a contract if and only if what the lender expects to receive is greater than what is provided. This can be formulated as equation (3):

$$Exp\ (\Pi\ (R)\ /\Sigma) = \Pi\ (R)\ prob\ (payment) = \Pi\ (R)\ \int_{\underline{T}}^{\overline{T}}\int_{s(T)}^{\overline{\varepsilon}} d\ Z\ (T,\ \varepsilon/\Sigma) \geq \Pi\ (L). \qquad (3)$$

To clarify matters a bit, consider the following example. Say the borrower's type is T'. Then the probability of being paid is equal to the probability that $\varepsilon > s$ (T'), i.e. equal to $\int_{s(T')}^{\overline{\varepsilon}} d\ Z\ (T,\ \varepsilon/\Sigma)$. However, since the lender does not know T, the probability of being paid must be computed over all possible types (hence the use of the double integral).

The lender can affect the probability of repayment by influencing how the contract C is formed (e.g. the borrower may be forced to sell assets to service the debt in case he goes bankrupt). Such an arrangement does not come without cost, however. If contract-enforcement mechanisms other than K $(T,\ \varepsilon,\ C)$ are sufficient, the solution may be to bypass formal guarantees. In economies where legal systems are weak and inefficient, repeated interaction is a significant enforcement mechanism. Imperfect enforcement can result in rationing if, for all possible contractual forms, the net value of the transaction is negative. Large anonymous transactions can be expected to be carried out by legal institutions that are able to provide collateral, while small anonymous transactions can be expected to be self-liquidating, with, for instance, immediate cash payment. Since repeated interaction often works well in commercial trade, limited use of formal guarantees and the court system can be expected (for an empirical application, see e.g. Isaksson, 2001a). Basically the same holds true for informal-financial arrangements (see e.g. Isaksson, 2001b).

A rational borrower will agree with the contract ex ante if and only if he expects the benefit to be positive. The borrower knows T', let π $(L,\ T')$ denote the value of

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[8] Thus, any possibilities of partial payment are ignored.

receiving L for the borrower.[9] If in period 2 the borrower pays, he incurs a cost of π (-R, T', ε). If the borrower decides not to pay, he incurs the punishments in (1). Given the borrower's type, payment occurs with probability $\int_{s(T')}^{\bar{\varepsilon}} dF$ (ε/T'). Therefore, the following condition for the borrower's acceptance of the contract is arrived at:

$$\pi\,(L,\,T') \geq \int_{s(T')}^{\bar{\varepsilon}} \pi\,(-R,T',\,\varepsilon)\,dF\,(\varepsilon/T') \tag{4}$$

$$+ \int_{\underline{\varepsilon}}^{s(T')} \{G\,(T',\,\varepsilon) + K\,(T',\,\varepsilon,\,C) + ExpL\,(\varepsilon,T') + ExpO\,(\varepsilon,T')\}\,dF\,(\varepsilon/T').$$

The empirical analysis in Section Four is based on this model in the sense that the variables used to explain access to formal credit are chosen with this model in mind. Another source of explanatory variables are the previous studies briefly surveyed in the introduction.

3. Data

3.1 The dataset

The data used in this paper constitute a comprehensive panel-data set on a sample of firms within the Kenyan manufacturing sector. The data cover 1993-95, which are also the years when the data were collected.[10] The collection of data was organised by the World Bank in a research project called Regional Program on Enterprise Development (RPED), and undertaken by a team from Göteborg University and Nairobi University.

The dataset consists of more than 200 firms from four industrial sub-sectors: Food, Wood, Textile, and Metal. These sectors were selected because firms in these sectors were perceived to have the greatest likelihood of exporting. These firms are

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[9] As before, partial payments are ruled out.
[10] What years the data cover is not always obvious. While questions about outputs and inputs clearly refer to "last year", questions about finance are about "current outstanding balance", i.e. "this year". For that reason, there is certainly a mix of years in the data and when explaining outstanding debt by sales it is the case that this year's debt is explained by last year's sales. This is not entirely negative because potential problems with endogeneity bias are at least partly rectified this way. Since current outstanding debt is at focus in this paper it seems reasonable to refer to the years when the interviews were undertaken.

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located in four different cities, Nairobi, Mombasa, Nakuru, and Eldoret. They range from micro-firms to multinationals. Further, the dataset covers informal as well as formal firms. There is a slight degree of attrition in the data, but for the majority of the firms in the panel it has been possible to obtain data for all three years.

3.2 Debt portfolios and the incidence external finance

Table 1 presents the mean and median debt portfolios by: First, firm status (i.e. whether the firm is formal or informal) and; second, by firm size (as measured by the number of employees) and ethnic origin of the firm owner for formal firms only.

It is clear from Table 1 that, in absolute terms, formal firms borrow a lot more than do informal firms. The mean informal firm only borrows 0.4 per cent of what the mean formal firm does. For the formal firms, 36 % of external finance comes from short-term borrowing such as overdraft facilities. Long-term borrowing from commercial banks and non-bank financial institutions (NBFIs) constitutes 20 per cent of a formal firm's debt portfolio. Corresponding figures for informal firms are seven and 10 per cent, respectively.[11]

Across formal firms, African-owned firms borrow almost as much as Asian-owned firms, but the ethnic group that borrows the most is the residual one ("Other"). While Asian- and "Other"-owned firms tend to have a larger share of formal finance in the form of short-term borrowing, African-owned firms have 32 per cent in long-term borrowing and only 19 per cent in short-term debt. Asian-owned firms hold 42 per cent short-term and 18 per cent long-term, while for the category "Other' the corresponding figures are 23 and 20 per cent, respectively. A plausible explanation for this discrepancy across ethnicity is that African owners that get to borrow tend to be large. In general, firm-owners of Asian and, say, European origins have higher access to formal finance given any firm size.[12] Whether this explanation holds when controlling for other determinants is something the paper returns to below.

Compared with Micro and Small firms, relatively large firms (Medium and Large), among formal firms, tend to hold relatively large shares of external finance in short-term borrowing (between 37 and 40 per cent). Somewhat surprisingly, however,

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[11] A World Bank multi-country study finds that, after controlling for borrower characteristics, firms in developing countries use less long-term debt than their counterparts in developed countries (Caprio, Jr. and Demirguc-Kunt, 1998).

Micro firms have the largest share of long-term borrowing (27 per cent), although in absolute terms the amount is, of course, very small. The share of long-term borrowing for the other size groups is in the vicinity of 20 per cent.

In general, short-term credit is much more common than the long-term one. On the part of the banks, short-term credit could be a way to control borrowers, a mechanism used more often when financial infrastructure is undeveloped (Diamond, 1991). However, a matching-hypothesis may suggest that short-term external finance should mainly be used for working-capital purposes and that acquisition of fixed assets and equipment do not bring a rate of return at par with short-term loan costs. Overdraft facilities together with trade credit from suppliers account for more than 70 per cent of the debt portfolio for the mean formal firm. Whether this reflects demand from the firms or restricted supply on the part of financial institutions is further discussed below. But one explanation for the great use of (at least) trade credit is the weak legal system and undeveloped financial system, which restrict supply of formal credit.[13]

Table 2 shows the number of firms that have a certain credit category. Comparing first across firm status, it can be seen that 63 per cent of the formal firms have an overdraft facility and that only 7.5 per cent of the informal firms have such a facility. More than 10 per cent (13 per cent) of the informal firms have borrowed on long-term basis, while the corresponding figure of formal firms is 40 per cent. Across formal firms only, Table 2 shows that 71 per cent of the Asian-owned firms borrow short-term, while the figure for African-owned firms is 44 per cent only.

The roles shift when it comes to long-term borrowing because 48 per cent of the African-owned firms borrow long-term, while only 38-40 per cent of the Asian- and "Other"-owned firms do that. In other words, it seems that non-African-owned firms favour short-term borrowing, while African-owned firms prefer long-term borrowing. Another interpretation of this result, however, is that African-owned firms are discriminated against, or that Africans tend to own small or young firms. Finally, as can be expected, the incidence of short- and long-term loans tend to increase with firm size.

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[12] Other ethnic origin is essentially composed of owners from Europe or the Middle East.

[13] This provides some support for the proposed substitution (between formal credit and trade credit) hypothesis in Demirguc-Kunt and Maksimovic (2001).

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3.3 Collateral and interest rates

Are firms treated differently as to how often and much collateral they have to pledge? Does the cost of borrowing differ across firms of different types? These are the topics investigated in Table 3. Since commercial banks and NBFIs traditionally have had different lending policies it is useful to separate the two lenders. In general, it is found that NBFI loans less often require collateral and that the collateral-loan ratio is smaller. However, there is some evidence that NBFIs tend to charge a higher interest rate on the loans.

A comparison between formal and informal firms for loans from commercial banks (the number of observations for informal firms' borrowing from NBFIs is too small to be analysed in any credible way) reveals that collateral is demanded in almost every case for both categories of firms. However, informal firms have to pledge a higher amount of collateral for each amount of loan. This may not necessarily indicate that informal firms are not trusted as borrowers. Instead it could be a reflection of the lump-sum character of security that, for instance, land constitutes, and that informal firms tend to borrow only fairly small amounts. Another explanation for the general observation that collateral-loan ratios exceed unity is that it might mirror the uncertain enforcement prospects of contracts in Kenya as well as the costs of seizing and selling collateral. Interestingly, formal firms are charged a higher interest rate than informal firms. This could be a reflection of paying capacity or that interest rates increase with the loan amount.

The frequency of collateralised loans appears to be the same across ethnicity (for formal firms), but lower in the case of NBFI loans. Asian-owned firms pledge the highest amount of collateral, followed by African- and "Other"-owned firms. The mean value of the collateral-loan ratio for Asian-owned firms is a whopping seven per cent, although the median collateral-loan ratio is only half of that. Still, it appears that collateral several times the loaned amount must be offered. Asian-owned firms also pay the highest interest rate and the median interest rate is three percentage points higher than that for African- and "Other"-owned firms. This could be a sign of significant network effects, where African and "Other" owners in such cases are the ones connected to the bankers. However, it could also suggest that African-owned firms have lower payment capacity than Asian-owned firms.

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The larger the firm, the higher the frequency of collateralised loans (for formal firms). This means that smaller firms that cannot put up collateral still can get a loan. One might expect higher interest rates for such firms, but this is not the case. Micro firms, the category of firms that have the least number of collateralised loans (37 per cent), also by far pay the lower interest rate (on average only about 12 per cent, while the other size categories pay approximately 20 per cent). The collateral-loan ratio for Micro firms is only two per cent; corresponding figures for Small to Large firms is about six per cent. However, one should bear in mind that Micro firms obtain far fewer loans than the other size groups, and that it is only when they are lucky enough to obtain a loan they get such favourable conditions.

3.4 Access to and the costs of borrowing

Tables 4 and 5 show how firms perceive the way credit supply has changed over time (and in effect after financial liberalisation). It may be worth noting that increased credit supply is not necessarily the obvious outcome of financial-sector reform. On the contrary, the banks' response to reform may very well be to lower the credit supply in order to obtain a more favourable loan portfolio.

Table 4 distinguishes between formal and informal firms. Access to overdraft facilities did not change much between 1994 and 1995 for informal firms, but the cost of such a facility went up somewhat. Overdraft facilities are perceived to be difficult or very difficult to obtain and the cost is very high. Access to long-term borrowing deteriorated for informal firms and about 70 per cent of the responding informal firms say it is very difficult to borrow long-term. Costs associated with such borrowing are very high.

For formal firms, access to overdrafts was said to be easy and became easier over time. Costs for overdraft facilities fell as well. Access to long-term borrowing was more or less unchanged and costs seem to have gone down from "very high" to "moderately" so. Financial institutions thus increasingly seem to have shifted towards formal firms, which may have to do with improved standards of operations and greater formalities (e.g. such as requirement for accounting) involved in applying for a loan (e.g. see Isaksson, 2001b).

Concerning just formal firms, and using the same groups as in Table 3, several interesting results appear. Starting with ethnic origin, access to an overdraft facility is

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hardest for African-owned firms and easiest for "Other"-owned firms, while the cost of having an overdraft facility is highest for African owners and lowest for "Other"-owned firms. The same pattern appears for long-term borrowing. Approximately 70 per cent of the African-owned firms perceive long-term loans to be very expensive and a third say it is very difficult to get such a loan (although 47 per cent say it is easy). These results may suggest some degree of market segmentation across ethnic lines. Access to overdraft gets easier and easier the larger the firms, but the costs associated with it are perceived high for all size groups (although least so for Micro firms). Long-term loans appear easy to obtain for relatively large firms, but again costs are felt to be very high. Market segmentation hence seems to be less evident across firm size. To the extent there is such market segmentation it is not in the expected direction.

4. Explaining the access to formal credit

The previous section provided a description of which type of firms use formal credit, about the costs involved, the requirements of pledging collateral, and how access and the cost of borrowing have changed since financial liberalisation. In this section multivariate analysis is employed to identify the factors that influence the probability of obtaining short- and long-term loans and the amount of loan a firm gets to borrow. First, the dependent and independent variables are defined; thereafter the econometric results are discussed. The section concludes with robustness checks.

4.1 The dependent variables

Two sets of regressions are estimated; the first one pertains to the likelihood that a firm has obtained an overdraft facility and the amount of overdraft obtained (as a share of total debt). The second set relates to the likelihood that a firm has obtained long-term borrowing from a commercial bank or NBFI and, again, how large an amount the firm could borrow (as a share of total debt). For the likelihood of having an overdraft facility or a long-term loan, the dependent variable is dichotomous (one if the firm has a positive outstanding balance of formal loans and zero otherwise).

4.2 The explanatory variables

The theoretical discussion is used as a guide to select the variables to be included on the right-hand side of the equations. The explanatory variables can be grouped into variables that represent the type of client, repeated interaction, reputation, enforcement, financial viability, market conditions, and other variables possibly relevant in explaining access to formal credit. While it is clear that a variable such as firm size can proxy for many important factors, it is the intention that these other factors be captured by other variables. Nevertheless, firm size (and other variables) is included at several places to illustrate its many facets.

Type of client

Since smaller firms are relatively risky, *firm size* (the logarithm of sales +1) is expected to be positively correlated with formal borrowing. Furthermore, there is more public information available for large firms than for smaller firms, which reduces asymmetric information. Relatively large firms can exert their market power. That is, losing a large customer could prove costly to the lender.

Well-educated staff (number of workers with higher education than secondary school in total labour force) could proxy for product-differentiation, itself a signal for lower risk and thereby better possibilities of external financing. A *well-educated staff* also signals ability, which increase the prospects of survival and repayment ability.

Formal firms (*Firm status*: dummy variable taking the value of one for formal firms and zero otherwise), as opposed to informal firms, are expected to have greater access to formal borrowing because of better repayment ability and their being exposed to legal enforcement. *International contacts* are represented by a trade variable, the proportion of imported raw materials. Firms that have established international contacts are thought to operate on a larger market with greater product diversification. Moreover, such firms also have access to recent production techniques and can learn from participation in international trade.

Ethnic origin could also contain information. For instance, *African* owners (dummy variable with value one for African-owned firms and zero otherwise) probably trade more with other Africans than with other ethnic groups. Presumably African clients as a group are poorer and therefore more risky debtors than Asians and other non-Africans and this might reduce the chances for African-owned firms to

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obtain formal credit. If firms with *African* owners are subject to statistical discrimination, that is, if Africans as a group are viewed to be less reliable in repaying credit, then the coefficient of African ownership will enter with a negative sign. Such discrimination could arise if Africans receive less credit in the first place and have fewer possibilities to smooth cash-flow fluctuations. A second possibility is straight-out racial discrimination. The other *ethnicity* variable included is that of *Asian* ownership, hence leaving "Other" as the reference group to compare with. It is hypothesised that Asian ownership positively relates to formal borrowing because Asian owners may to a larger degree socialise with bankers and other business people.[14]

Repeated interaction

Firm age (the logarithm of years of age of the firm +1) is intended to proxy for repeated interaction with lenders. Such repeated interaction is believed to be positively related to the likelihood of obtaining formal credit as well as to the amount of financing a firm is able to raise. Another reason why *firm age* is hypothesised to be positively correlated with formal borrowing is that older firms could have established social and business network with other businesses and banks.

Reputation

Firms spending resources on *promotion* (promotion as a share of sales) have incentives to fulfil promises and obligations in order to preserve reputation. Promotion could also proxy for brand name and firms with strong brand names have more to lose from breaking a contract. Promotion can therefore be seen as an investment in reputation and is expected to have a positive effect on obtaining formal credit.

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[14] To be sure, the interpretation of the effects of ethnic origin is not straightforward. Raturi and Swamy (1999) decompose the probability that a firm is credit constrained into the probability that a firm wants credit, given this that it applies for a loan, and that it is denied a loan. The authors then show that firms owned by Africans are more likely to be credit constrained, but not because they are denied external finance to a larger extent than are other types of firms. Instead, the result is driven by a greater probability that African-owned firms want loans. In the present paper, the effect of ethnicity is even more significant in the case of long-term finance, but the parameter of African ownership turns out to be positive, not negative.

Firm size is assumed to relate positively to formal borrowing because relatively large firms have more to lose in terms of reputation in case of breach of contract than do relatively small firms. The same argument applies to *firm status*.

Enforcement

Relatively large firms (*firm size*) probably have more social capital at stake, which means that their reputation can be used as an enforcement mechanism. Firms with *tangible* assets (replacement value of capital as a share of total assets) have something to pledge as security, which leads to an expected positive association between tangible assets and formal credit.

Market conditions

The level of capacity utilisation captures the *demand situation* (the inverse of how much more a firm could produce if the demand were there). A high degree of idle production capacity should be negatively related to chances of obtaining credit.

Financial viability

Gross profit (gross profit per employee) is thought to proxy for a firm's financial viability. If profit succeeds in playing that role the expected sign of the parameter is positive. However, it is uncertain whether relatively profitable firms have more external finance because the theory of pecking order dictates that a firm's first choice of capital is internal. To the extent the pecking order is in operation, the expected coefficient of profit could actually be a negative one. A priori then, the expected sign of the parameter is ambiguous.

Other explanatory variables

If relatively large cities have better financial infrastructure, location in relatively *big cities* (dummy variable with a value of unity if the firm is located in either Nairobi or Mombasa, zero otherwise) could increase the likelihood of obtaining credit. On the other hand, larger cities could mean that the distance between borrowers and lenders is large, screening is difficult, and that possibilities of monitoring what the loaned amount is actually used for are reduced. In such a case it could turn out better to be located in a relatively small city where it is easy to establish a personal contact with the lender. Hence, a priori the expected sign of the coefficient is ambiguous.

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Time-dummy variables are included to proxy for overall economic conditions and they are useful when assessing whether access to long-term capital has changed over time. Finally, sector-dummy variables are included to capture industry specificity that is not covered by other variables included.

4.3 *Estimation results*

Four types of estimations are undertaken, two each for short- and long-term borrowing, where the first set of estimations consists of estimating Probit models to explain the probability that a firm has access to an overdraft facility or long-term loans. The second set of estimations uses Tobit and involves explaining how much short- and long-term credit a firm has obtained.

Two considerations come to mind. First, since a three-year panel is available, there may be good reason to estimate the panel versions of Probit and Tobit, respectively. According to the Hausman test, it is indeed the case that the data support the panel versions over the cross-section ones. The flip side, however, is the non-triviality of testing and correcting for heteroscedasticity in panel versions of limited-dependent models. And non-homogenous variance seems to be the case throughout.

Second, due to a potential sample-selection bias, there may be good reason to do the Probit and Tobit estimations simultaneously. But, as with the problems of correcting for heteroscedasticity, a panel version of such simultaneous estimation is a non-trivial matter. However, simultaneous estimation of the cross-section versions does not for any "pair" of estimations indicate sample-selection bias and, therefore, the "two steps" are estimated separately. With these two considerations in mind, the estimation results are now presented.

First, the results from estimating a cross-section Probit (CS Probit) along with the marginal effects are presented; these results are followed by those of a random-effects Probit (RE Probit). After the Probit estimations, a cross-section Tobit (CS Tobit), and the corresponding marginal effects, is estimated followed by a random-effects Tobit (RE Tobit).

Table 6 contains the results of two types of estimations: First, for the probability that a firm has incurred short-term credit in the form of overdraft and; second, for the amount of short-term borrowing. The Probit and Tobit results have in common the importance of firm size, firm status, firm location, and that a firm has international

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contacts. Firm age and the owner being African appear to have an impact on the amount of short-term borrowing.

Starting with the probability of having an overdraft facility, it can be seen that this relates positively to firm size.[15] An increase in firm size by one per cent increases the likelihood of its having access to an overdraft facility by almost 15 percentage points. If the firm is classified as being formal (as opposed to being informal) access to an overdraft facility is 25 percentage points higher. These are economically large effects, which indicate, for credit purposes, the unfavourable situation of small firms and of firms staying outside the legal system.

The superior financial infrastructure in Nairobi and Mombasa does not seem to outweigh the advantage of close connection between lenders and borrowers. In relatively smaller cities (in this case Nakuru and Eldoret) it is likely that banks are more familiar with potential borrowers and thus the lender has better information about the borrower. In the anonymity of a big city, adverse selection and moral hazard are likely to pose problems. The big advantage of being located in a relatively small city is evidenced by the large parameter of such a location. Firms in Nakuru and Eldoret have 35-percentage points greater probability of obtaining short-term credit than firms in Nairobi or Mombasa. However, since only 19 per cent of the firms are located in Nakuru or Eldoret, one may need to exercise some caution in interpreting the parameter of location.

Firms that deal in international markets are more likely to have an overdraft. An increase in the proportion of imported raw materials by one percentage point (from 18 to 19 per cent) increases the probability of having a short-term loan by 39 percentage points. This large effect is somewhat surprising given the study by United Nations Development Programme (UNDP)/World Bank (1993), which suggested that exporting firms were perceived to be greater risks than those oriented towards the domestic market only. It is possible that the proxy chosen for outward-orientation explains the large parameter in a trivial fashion, since overdraft facilities are normally

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[15] While it is likely that a lender uses firm size as a "short-cut" to the lending decision, one has to be somewhat cautious regarding the magnitude of the parameter. The reason is that every loan has a fixed cost attached to it. The larger the loan the smaller is the share of the fixed cost in the loan. Everything else equal, a bank might, therefore, be more interested in lending to a large borrower than to a small one. To clarify, if a bank has the choice between lending 100,000 dollars to a big company or 10 loans of 10,000 dollars each to 10 small companies, the bank might find it more attractive to choose the first option.

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used for working-capital purposes. This issue is further discussed in the section on robustness-checks.

The next point of interest is the amount of short-term credit. Here the suggestion is that firm size plays a lesser role than for access to an overdraft facility. One possible explanation for this result is that screening is mainly undertaken for determining whether or not a firm is creditworthy. Once the decision that credit will be extended has been taken, monitoring of how the money is used is more important for the amount decision than the amount itself (at least when the borrowed amount is not unreasonably large given the firm- and project characteristics). An increase in firm size by one per cent increases the share of overdraft in total debt by two percentage points.

However, other variables have larger effects. If the firm has a formal status, the share of overdraft in total debt is almost 20 percentage points higher than if the firm is informal. Location in a big city is negatively related also to the amount of short-term credit. Firms in relatively large cities have an overdraft ratio that is 12 percentage points smaller compared with firms in relatively small cities. The reason for this result may be that once a loan has been given, it is easier in a relatively small city easier to monitor how the loan is used and this reduces the problems of moral hazard. Outward-orientation is negatively related to the amount of short-term borrowing (at the 10 per cent level of significance), a result that corroborates the findings in UNDP/World Bank (1993). The result also removes some of the fear of proxying outward-orientation by raw-materials imports.

A one per cent increase in firm age is associated with a halving in the share of short-term credit. The coefficient of firm age is very large and somewhat surprisingly negative, and the latter might indicate that its usefulness as a proxy for repeated interaction is limited. At least, the importance of repeated interaction seems dwarfed by the predominant use of short-term credit by relatively young firms, which might be an indication that young firms have to substitute long-term borrowing with short-term ones. If such substitution is a very important tool for young firms to obtain financing for long-term investment projects as well as for working-capital needs, a parameter of the size obtained here might nevertheless rationally be explained.

While ethnic origin of the owner did not enter the "access" regression, ethnicity seems to matter for the amount of short-term credit. African-owned firms obtain a share in overdrafts, which is smaller by 13-percentage points than that of the reference

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group "Other". There is a weak indication (the parameter is just outside the 10 percent significance border) that Asian owners obtain more overdrafts. This result contrasts with Fafchamps (2000), who did not find any effects of ethnicity.

There is also a hint that profitability may be negatively associated with how much short-term credit a firm chooses to borrow (again the parameter is just outside the 10 percent significance border). The parameters of the time dummy variables indicate that access to overdraft facilities was lower in 1994 compared with the previous year. This result is somewhat surprising in the light of financial-sector reform, which one would expect to at least not diminish credit supply. But, as mentioned earlier in the paper, the time-dummy variables are unable to capture the extent to which banks have increased the share of good loans to bad loans. Anyhow, a plausible explanation for the negative parameter can most likely be found in the adverse macroeconomic conditions that prevailed in Kenya in 1994. These adverse conditions deepened the distress into which the financial system had already been cast, mainly due to bad loan portfolios. This will be a recurring theme throughout this section, emphasised even more strongly in the case of long-term borrowing.

Finally, it is interesting to note that neither enforcement effects nor reputation effects seem to have significant impact on either the probability of obtaining an overdraft facility or on the amount of short-term credit. Likewise, market conditions are of negligible importance once other factors have been controlled for.

The results pertaining to long-term borrowing are presented in Table 7. Since heteroscedasticity does not seem to pose a serious problem, the RE Probit can be used to indicate statistically significant parameters. Profit, firm size, firm status, ethnicity, location, and the time dummy variables are suggested by the RE Probit to be interesting variables in explaining access to long-term borrowing. For magnitudes of parameters, attention is paid to the marginal effects obtained from cross-section estimation.

In accordance with the theory of the pecking-order principle of firm financing, the parameter of profit enters with a negative sign. An increase in profit by one per cent decreases the likelihood of getting a formal loan by two percentage points. Larger firms have a larger probability of obtaining formal credit than do relatively small ones. A one per cent increase in firm size is associated with a five-percentage points higher likelihood of having a formal long-term loan.

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As for overdraft facilities, location in relatively small cities has a positive effect on the access to long-term finance. Being located in a big city decreases access to long-term credit by 13 percentage points. A large effect is obtained from firm status, where formal firms have a 33-percentage point higher access to formal credit than informal firms.

Interestingly, African-owned firms have a higher, not lower, likelihood of getting formal long-term credit than firms owned by non-Africans and non-Asians. The effect is as large as 34 percentage points. Again, this result contests the results of Fafchamps (2000). Moreover, it casts serious doubts on the view that African-owned firms are likely discriminated against in the credit market. There is also some (weak) indication that Asian-owned firms have better access than have non-Africans and non-Asians. Finally, over time, access to long-term credit has weakened significantly. Access in the second year is about nine percentage points lower than in the first year, in the third year access is 12 percentage points lower. As for overdrafts, adverse macroeconomic conditions seem to outweigh the potential positive effects of financial liberalisation.

For the amount of long-term loan, in principle the same explanatory variables are pointed at. One exception, however, is the inclusion of tangible assets, the proxy for collateral. An increase in the share of tangible assets in total assets (from 39 to 40 per cent) increases the share of long-term credit (in total debt) a firm obtains by about 12-percentage points. This is an economically large effect and may suggest that legal contract-enforcement mechanisms after all are at work in Kenya.

Relatively profitable firms borrow smaller amounts than do relatively unprofitable ones. Again, this result supports the notion of pecking order financing. Larger firms borrow more, but the effect is not very strong. A one percent increase in firm size is only associated with a 1.4 percentage point large share of long-term borrowing. Firm-size effects are clearly dwarfed by, for instance, the ability to pledge collateral.

If a firm has a formal status, it gets to borrow 17 percentage points more long-term credit compared with informal firms. African-owned firms not only have better access to formal long-term credit, they are also able to borrow more as a share of total debt (15 percentage points more) than are "Other"-owned firms. Based on the RE Tobit, there is no statistically significant effect of Asian ownership. The results from the CS Tobit, however, indicate a small positive effect of such an ownership.

In terms of magnitude, there is no large difference between being located in a big or small city (five percentage points), but that there is any effect at all is interesting. Finally, not only has access to long-term financing diminished, but the amount a firm can borrow on a long-term basis has also decreased.

In conclusion, what counts for a firm that needs to borrow for investment in real capital is the ability to offer some sort of security. In addition, African owners seem to have better access to long-term formal credit and get to borrow a larger amount than do other firms. Firms in smaller cities appear to have better contact with the lenders and lenders thereby have better a priori information about the firms. Furthermore, the ability to monitor what the loan is used for is greater in smaller communities. A firm that is licensed (i.e. formal) has an advantage over an informal firm because such a firm status has enabling information content. Variables related to repeated interaction, skill, demand conditions, reputation, outward-orientation and industry are of less relevance to the long-term credit supply decision.

The next issue to address is whether these results survive a battery of robustness checks.

4.4 Robustness checks

First, the regressions are re-estimated with slightly different definitions of the dependent and independent variables. Second, a few candidate explanatory variables not previously included are tested for their influence on the likelihood of obtaining formal credit and the amount of credit obtained. Finally, in order to ensure that outliers do not drive the estimation results, the results are also checked for different reporting frequency of results (e.g. annual or monthly).

4.4.1 Loans from commercial banks and NBFIs

The dependent variables for long-term borrowing include loans from both commercial banks and NBFIs. However, the descriptive analysis of Section three hinted that commercial banks and NBFIs offer different loan conditions. Removing loans from

NBFIs checks for the influence of aggregating loans from these two types of financial institutions.[16]

The effect of removing NBFIs in the CS Probit regression is to obtain a stronger effect of collateral (tangible assets), whose parameter is now statistically significant at the 5 per cent level. However, the effect of Asian ownership is weaker. The parameter of being located in a big city is no longer statistically significant, but on the other hand outward-orientation takes that place. One of the industry dummy variables now enters the regression with a negative effect, to wit the Textile sector. For the amount of long-term credit regression, the effects are "only" that outward-orientation substitutes for location in Nairobi or Mombasa. This effect is not present in the RE Tobit. All in all, there is no doubt that for location and international contacts, loans from NBFIs tend to drive the results. For the other variables, there are no dramatic changes to report.

4.4.2 Domestic versus foreign ownership

Ownership status may contain important information about the firms. Firms with *foreign ownership* (dummy variable taking the value of one for firms with some foreign ownership and zero otherwise) may have better contacts with international financial markets and perhaps a large company behind. This increases the firm's potential of good performance. Furthermore, the markets for their products could also be larger as they may be more likely to be export-oriented. However, it is possible that domestic-owned firms have better contacts with the domestic financial market. If so, foreign ownership could be negatively related to external financing.

However, neither in the overdraft regressions, nor in the long-term borrowing regressions, did foreign ownership enter significantly. In the overdraft and long-term credit Probit regressions, inclusion of foreign ownership renders Asian ownership significant at the 10 per cent level. In the latter regression, the parameter of collateral (tangible assets) is significant at the five per cent level. Finally, in the overdraft Tobit regression, outward-orientation leaves the regression. In sum, inclusion of foreign ownership has very little effect on the results.

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[16] In the case of short-term borrowing, all information pertains to commercial banks only so there is no

4.4.3 Outward-orientation

How good is the chosen proxy for outward-orientation and can other proxies do an equally good job? Two other proxies were experimented with: First, a dummy variable with the value of unity if the firm is engaged in export activities, and zero otherwise; second, the share of exports in firm output.

Firms engaged in *exports* may be perceived to pose a less risky debtor because of risk diversification and scale effects in international trade. However, as mentioned previously, a study by UNDP/World Bank (1993) indicated that Kenyan banks view export activities to be more risky than a focus on the domestic market. What sign export behaviour will take is therefore somewhat ambiguous.

The results are somewhat disappointing in that neither the export dummy variable nor the amount of exports enters any of the regressions. The only discernible effect of including the share of exports occurs in the overdraft Probit regression, where promotion is significant at the 10 per cent level. Doubts can be cast on whether the proportion of imported raw materials really measures outward-orientation in general or whether such an activity simply demands services in the form of overdraft facilities.

4.4.4 Different time periods

Most of the firms in the sample provide figures based on annual data, but some firms, especially smaller ones and informal firms, sometimes report with shorter frequency. As a first exercise, firms reporting data for less than a quarter are deleted. Such a deletion leaves 379 observations (a reduction by 17 per cent) to be used for estimation.

In the overdraft Probit regression, firm status is now only significant at the 12 per cent level, which can be explained by the fact that informal firms are those that most often report figures covering shorter period of time. In the overdraft Tobit regression collateral enters with an unexpected negative sign. More severe consequences are experienced in the long-term borrowing Probit regression, where Asian ownership, collateral, and Textile sector enter more strongly in terms of statistical significance and the effect of location is now only statistically significant at

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need to try a re-definition of the variable.

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the 10 per cent level. In the Tobit regression, the only effect is that Asian ownership enters at the five per cent level instead of at the 10 per cent level.

Deleting all firms reporting with higher frequency than annually removes another six firms (an 18 per cent reduction). The only additional effect is to render the coefficient of location in a big city statistically insignificant at conventional levels in the long-term credit Probit regression.

4.4.5   Summary of robustness checks

Two variables, outward-orientation and location in a big city, appear sensitive to alternative definitions of variables and reporting frequencies. Regarding the other results obtained in Section 4.3, it seems fair to conclude that they are robust to the tested alternatives.

5. Conclusions

This paper has studied what factors influence the banks' decisions to extend short- and long-term finance to manufacturing firms in Kenya. A theoretical model explaining under what circumstances a loan contract can be agreed upon laid the basis for the empirical work. A three-year panel dataset of more than 200 Kenyan manufacturing firms was used for the descriptive and multivariate analyses.

The descriptive analysis indicated that firm status (formal and informal firms) plays a chief role for whether a firm obtains formal-sector credit or not. Among formal firms, different ethnic groups seem to favour different time horizons in borrowing. Asian-owned firms tend to borrow on short-term, while African-owned ones favour long-term borrowing. Relatively large firms have considerably more outstanding debt, but the differences measured as formal borrowing in total debt were not significant across firm size.

Almost all loans require some sort of collateral, but there appear to be a few exceptional cases where firms that cannot offer any security still obtain loans. Collateral tends to be several times the borrowed amount, while interest rates charged also seem to follow a kind of "ability-to-pay" pattern. The feeling among firms is that access to formal credit over time has not improved despite financial-sector reform. Furthermore, costs associated with both short- and long-term borrowing are perceived to be very high. There is a tendency for firms with African owners and for relatively

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small firms to state that access to credit is difficult, but the multivariate analysis showed that this is true only for short-term credit. The answers about costs associated with borrowing essentially follow similar lines.

Multivariate analysis of overdraft borrowing indicated that firm status, firm size, and location in a small city increase both the access to such borrowing and the amount a firm gets to borrow. Regarding long-term finance, there is considerable support for the idea that firms prefer internal to external borrowing (the pecking-order principle). Also true for long-term finance is the fact that firm size, location, and firm status matter, but additional determinants are the ability to pledge collateral and ethnic factors.

Since type of borrower seems to play such a big role in the lending decision, one can conclude that information costs of whether a project is bankable or not, and monitoring costs after the loan has been extended, are quite high. Large formal firms signal low risk and the expectation that the firm's intended investment will pay off compared with an investment project proposed by a small firm. In an economy where contract enforcement is uncertain due to a weak legal system, risk-aversion of banks outweighs the expected profit of seeking up the most profitable projects (because the search costs are so high). Preference for lending to formal large firms indicates that reputation plays a principal role, but it also suggests that banks tend to take the safest routes.

Information and monitoring costs are mitigated by the proximity of lenders and borrowers. Such proximity allows banks to monitor the use of credit. It works in a fashion similar to the relationship between a village moneylender and borrower, or the one between a landlord and a tenant. While policy cannot affect the geographical proximity between lenders and borrowers, improving information flows and increasing the transparency of firms' accounting could shorten the abstract distance between lenders and borrowers. Hence, this seems a promising area where reform can make a difference.

Strengthening of the legal system so that contracts can be enforced with a high degree of certainty ensures the validity of collateral. Property rights must be secured and there is most likely need for reform in this area as well. Corruption tends to jeopardise trust in the legal system.

Until the financial system is able to work under conditions of macroeconomic stability, support from an impartial and fair legal system and enhanced information

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flows, exaggerated risk-aversion can be expected to prevail. As long as that continues, only firms that are already prospering will obtain formal finance. Other firms will have to seek alternative ways to finance their investment and working capital. Under such circumstances, the manufacturing sector, which is dominated by relatively small firms, cannot be expected to play a leading role in Kenya's outreach for economic development, improved welfare and reduced poverty.

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Appendix

Table A1 shows the proportion of formal and informal firms in different categories, industries, size groups, ethnic divisions, and location. There are a total of 654 observations in the dataset, of which 27 per cent are informal ones. While the formal firms are evenly distributed across industries, there are relatively few informal firms in the food sector. Among the formal firms the majority are either medium or large-sized. As expected, informal firms tend to be very small. Mostly, informal firms are owned by Africans, while formal firms tend to have Asian owners. Most firms in the sample are located in Nairobi, although there are quite a few in Mombasa as well.

Table A1. Proportion of firms in various sub-groups, mean 1993-95

	Formal firms	Informal firms
Food	27.50	13.40
Wood	25.20	30.70
Textile	23.70	24.60
Metal	23.70	31.30
Micro	8.00	74.30
Small	22.60	24.60
Medium	37.30	1.10
Large	31.70	0.00
African	22.00	96.60
Asian	68.50	1.70
Other	9.50	1.70
Nairobi	67.30	55.90
Mombasa	13.60	27.40
Nakuru	10.90	8.40
Eldoret	8.80	8.40
N (=654)	**475**	**179**

Note: The size-groups are defined as follows: Micro firms have up to 5 employees, Small firms have 6-20 employees, Medium-sized firms have 21-75 employees, and Large firms have from 76 employees and onwards. N stands for number of observations.

Table 1. Mean and median outstanding balances (Ksh '000), average of 1993-95

Inflow of Funds	African	Asian	Other	Micro	Small	Medium	Large	Formal	Informal
Gross outstanding	19588	23694	33794	1169	1558	7046	61610	24195	117
Balances	(2650)	(4100)	(13875)	(350)	(800)	(2600)	(27150)	(4170)	(14)
Of which in per cent:									
Short-term formal loans	19.20	42.00	23.04	28.84	29.24	40.49	36.87	36.25	6.94
	(3.39)	(39.25)	(16.71)	(1.10)	(9.09)	(32.58)	(33.89)	(30.79)	(0.00)
Long-term formal loans	32.22	17.87	20.17	26.63	18.60	20.74	20.04	20.35	9.96
	(21.82)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(10.97)	(0.00)	(0.00)
Informal loans	8.73	1.53	2.77	7.42	7.71	1.80	1.07	3.08	13.85
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Owed to Suppliers	25.63	34.58	43.03	13.75	35.61	32.27	37.40	33.78	18.53
	(12.55)	(26.67)	(35.59)	(0.00)	(18.52)	(21.17)	(33.33)	(25.35)	(0.00)
Owed to Clients	14.22	4.02	10.99	23.76	8.84	4.70	4.63	6.54	50.72
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(51.28)
N	**74**	**257**	**36**	**19**	**75**	**142**	**122**	**359**	**63**

Note: Included in the Table are only firms that had any external finance in at least one of the three years examined and that have data for all categories of inflows. Furthermore, lack of data on Firm size and Status of firms (i.e. Formal vs. Informal) produces a sum of observations for these two categories less than the sum of observations for Ethnicity. Median figures are in parentheses. The Size [Micro (1-5 employees), Small (6-20), Medium (21-75), and Large (76+)] and Ethnic [African, Asian, and Other] groupings refer to formal firms only. Informal firms almost exclusively consist of microenterprises. N stands for number of observations.

Table 2. The incidence of external finance, 1993-95

Prop. of firms with:	African	Asian	Other	Micro	Small	Medium	Large	Formal	Informal
Overdrafts	44.12	71.29	50.00	33.33	43.69	67.86	79.02	63.27	7.56
Formal loans	48.04	38.71	39.58	35.00	29.13	38.69	53.85	40.27	13.37
Informal loans	10.78	7.74	6.25	8.33	11.65	7.14	6.29	7.96	20.35
Owed to Suppliers	46.08	64.52	66.67	22.22	53.40	61.90	71.33	59.96	16.28
Owed to Clients	26.47	15.81	35.42	33.33	21.36	16.07	19.58	19.69	39.53
N	**102**	**310**	**48**	**36**	**103**	**168**	**143**	**452**	**172**

Note: Since a firm can finance its operations from a combination of sources the number in the table do not sum up to 100 per cent. Furthermore, lack of data on Ethnicity and Status of firms (i.e. Formal vs. Informal) produces a sum of observations for these two categories less than the sum of observations for Firm size. N stands for number of observations.

Table 3. Mean and median collateral and interest rates, 1993-95

	African	Asian	Other	Micro	Small	Medium	Large	Formal	Informal
Frequency of Collateral									
Bank loans	100.00	93.60	100.00	36.80	61.70	92.70	96.60	95.90	90.00
(N)	(34)	(78)	(10)	(7)	(16)	(41)	(58)	(123)	(10)
NBFI loans	81.80	71.90	100.00	100.00	62.50	75.10	81.30	73.30	100.00
(N)	(11)	(32)	(1)	(1)	(8)	(20)	(16)	(45)	(3)
Mean and Median Collateral as a share of loan									
Bank loans	4.30	6.86	2.70	2.36	6.08	5.49	6.21	5.75	9.29
(Median)	(2.94)	(3.53)	(1.88)	(1.92)	(5.00)	(2.50)	(3.00)	(3.02)	(2.27)
(N)	(33)	(77)	(11)	(6)	(16)	(40)	(59)	(122)	(9)
NBFI loans	0.70	3.66	-----	-----	1.00	1.90	4.48	3.10	-----
(Median)	(0.70)	(2.00)	(-----)	(-----)	(1.00)	(1.67)	(2.25)	(1.90)	(-----)
(N)	(2)	(15)	(0)	(0)	(2)	(5)	(10)	(17)	(0)
Mean and Median Interest rate									
Bank loans	17.94	21.54	18.83	11.58	20.92	21.00	21.20	20.48	15.50
(Median)	(18.00)	(21.00)	(18.00)	(8.25)	(20.00)	(19.00)	(21.00)	(20.00)	(18.00)
(N)	(26)	(68)	(6)	(6)	(12)	(33)	(49)	(101)	(6)
NBFI loans	23.00	20.96	-----	20.00	22.33	21.63	20.00	21.25	21.00
(Median)	(22.00)	(19.00)	(-----)	(20.00)	(22.50)	(20.00)	(19.00)	(20.00)	(21.00)
(N)	(7)	(23)	(0)	(1)	(6)	(16)	(9)	(32)	(2)

N stands for number of observations (in italics).

Table 4. Access to and the costs of external finance, 1994 and 1995

	Formal		Informal	
	1994	1995	1994	1995
Access to overdraft facility is	**N=132**	**N=153**	**N=23**	**N=40**
- very easy/easy	59.80	54.30	0.00	10.00
- moderate/difficult	21.20	42.70	34.80	22.50
- very difficult/impossible	18.90	13.10	65.20	67.50
Cost of overdraft facility is	**N=133**	**N=152**	**N=19**	**N=30**
- very low/low	9.80	4.60	5.20	0.00
- moderate/high	15.80	51.30	34.40	30.00
- very high/prohibitively high	74.40	44.10	60.40	70.00
Access to long-term loans is	**N=113**	**N=150**	**N=23**	**N=41**
- very easy/easy	55.80	52.00	17.40	12.20
- moderate/difficult	24.80	32.00	17.40	14.60
- very difficult/impossible	19.50	16.00	65.20	73.20
Cost of long-term loans is	**N=113**	**N=147**	**N=21**	**N=31**
- very low/low	12.40	2.70	9.50	3.20
- moderate/high	13.30	53.10	14.30	32.30
- very high/prohibitively high	74.30	44.20	76.20	64.50

Note: N stands for number of observations (in bold).

Table 5. Access to and the costs of external finance, mean of 1994-95

	Formal firms						
	African	Asian	Other	Micro	Small	Medium	Large
Access to overdraft facility is	**N=55**	**N=198**	**N=28**	**N=16**	**N=69**	**N=104**	**N=96**
- very easy/easy	50.90	56.10	78.60	37.50	52.20	56.70	63.50
- moderate/difficult	21.80	29.30	17.90	31.30	27.50	24.00	30.20
- very difficult/impossible	27.30	14.60	3.60	31.30	20.30	19.20	6.30
Cost of overdraft facility is	**N=55**	**N=199**	**N=27**	**N=17**	**N=68**	**N=104**	**N=96**
- very low/low	5.50	6.50	11.10	11.80	5.90	8.70	5.20
- moderate/high	23.60	36.70	40.70	47.10	29.40	36.50	34.40
- very high/prohibitively high	70.90	56.80	48.10	41.20	64.70	54.80	60.40
Access to long-term loans is	**N=51**	**N=180**	**N=28**	**N=15**	**N=59**	**N=98**	**N=91**
- very easy/easy	47.10	53.30	71.40	33.30	47.40	54.10	60.40
- moderate/difficult	19.60	31.10	25.00	26.70	32.20	25.50	30.80
- very difficult/impossible	33.30	15.60	3.60	40.00	20.30	20.40	8.80
Cost of long-term loans is	**N=49**	**N=180**	**N=27**	**N=15**	**N=57**	**N=96**	**N=92**
- very low/low	4.10	7.80	7.40	6.70	7.00	6.30	7.60
- moderate/high	24.50	36.70	40.70	53.30	35.10	31.30	38.00
- very high/prohibitively high	71.40	55.60	51.90	40.00	57.90	62.50	54.30

Note: N stands for number of observations (in bold).

Table 6. Explaining overdraft borrowing, 1993-95

	CS Probit	Marginal Effects	RE Probit	CS Tobit	Marginal Effects	RE Tobit
Constant	-2.415*** (2.897)	-1.740*** (4.148)	-7.339** (2.492)	-0.687** (2.164)	-0.306** (2.337)	-0.589* (1.660)
Log Firm age	-0.091 (1.204)	-0.066 (1.261)	-0.253 (0.763)	-0.132*** (2.874)	-0.587*** (2.847)	-0.103* (1.668)
Profit per employee	-0.036* (1.739)	-0.015 (0.715)	-0.030 (0.816)	-0.011 (1.533)	-0.005 (1.539)	-0.013** (2.042)
Log Sales	0.202*** (3.693)	0.145*** (6.688)	0.535*** (3.751)	0.078*** (4.516)	0.018* (1.699)	0.060*** (3.047)
Capacity Utilisation	0.037 (0.767)	0.027 (0.789)	0.164 (1.294)	0.022 (1.076)	0.977 (1.078)	0.034** (2.190)
Tangible Assets	0.035 (0.209)	0.025 (0.209)	-0.010 (0.017)	-0.020 (0.459)	-0.900 (0.460)	-0.005 (0.060)
Educational level of staff	0.026 (0.163)	0.018 (0.163)	0.253 (0.389)	-0.154 (1.479)	-0.069 (1.485)	-0.040 (0.390)
Promotion-sales ratio	0.082 (1.182)	0.058 (1.198)	0.246 (0.548)	-0.009 (0.507)	-0.004 (0.506)	-0.001 (0.066)
Formal firm	0.347* (1.858)	0.250** (2.042)	1.508* (1.784)	0.435*** (2.887)	0.194*** (3.231)	0.360*** (2.581)
African owner	-0.119 (0.595)	-0.086 (0.602)	-0.381 (0.279)	-0.292*** (2.477)	-0.130*** (2.487)	-0.177 (1.072)
Asian owner	0.227 (1.249)	0.163 (1.320)	1.061 (0.786)	0.151 (1.574)	0.067 (1.570)	0.238* (1.668)
Location in Nairobi or Mombasa	-0.491*** (2.911)	-0.354*** (3.784)	-1.445** (2.153)	-0.273*** (3.661)	-0.122*** (3.823)	-0.277*** (2.919)
Outward-orientation	0.544* (1.907)	0.392** (2.282)	2.172** (2.095)	-0.160* (1.699)	-0.071* (1.723)	-0.020 (0.166)
Food	0.184 (1.201)	0.132 (1.272)	0.784 (1.033)	-0.011 (0.139)	-0.005 (0.139)	0.081 (0.770)
Wood	0.071 (0.509)	0.051 (0.509)	0.204 (0.283)	-0.058 (0.611)	-0.026 (0.611)	0.031 (0.282)
Textile	0.174 (1.184)	0.125 (1.199)	0.151 (0.206)	0.031 (0.376)	0.014 (0.376)	0.076 (0.688)
1994	0.013 (0.122)	0.009 (0.121)	-0.176 (0.516)	-0.162** (2.424)	-0.072** (2.494)	-0.136*** (2.755)
1995	-0.148 (1.235)	-0.107 (1.318)	-0.696 (1.592)	-0.019 (0.303)	-0.009 (0.303)	-0.054 (0.830)
N / Firms	458/222	-----	458/222	455/221	-----	455/221
R^2 [a]	0.76	-----	0.90	-----	-----	-----
Log-Likelihood	-135.61	-----	-125.35	-252.25	-----	-236.14
Joint $\beta = 0$ [b, c]	338.00***	-----	267.54***	224.11***	-----	136.07***
Heteroscedasticity [d, e]	8.17***	-----	-----	14.31***	-----	-----
Sample Selection [f]	0.18	-----	-----	-----	-----	-----
Pooled vs. Panel [g]	-----	-----	28.68***	-----	-----	46.52***

Note: ***, **, and * indicate significance at 1 %, 5 %, and 10 % respectively. N = number of observations. Absolute t-values are in parenthesis. Marginal effects are evaluated at the variable means. CS = cross-section, RE = random effects.
[a] For Probit: Zavoina and McElvey's (1975) pseudo R^2 [b] For CS Probit: Wald test of slope parameters jointly zero, χ^2[df] [c] For RE Probit: Likelihood ratio test of slope parameters jointly zero, χ^2[df] [d] Likelihood ratio test of H_0: No heteroscedasticity, χ^2[df] [f] T-test of H_0: Correlation coefficient $\rho = 0$, t[df] [g] Likelihood ratio test of H_0: Pooled, χ^2[df]

Table 7. Explaining formal long-term borrowing, 1993-95

	Probit	Marginal Effects	RE Probit	Tobit	Marginal Effects	RE Tobit
Constant	-3.547*** (4.586)	-1.177*** (4.756)	-4.285*** (3.751)	-1.504*** (4.014)	-0.439*** (4.284)	-1.358*** (3.234)
Log Firm age	0.015 (0.128)	0.005 (0.128)	0.024 (0.109)	0.005 (0.084)	0.001 (0.084)	-0.004 (0.049)
Profit per employee	-0.057*** (2.681)	-0.019*** (2.664)	-0.078** (2.486)	-0.024** (2.524)	-0.007** (2.501)	-0.023** (2.318)
Log Sales	0.157*** (3.795)	0.052*** (3.795)	0.197*** (2.773)	0.047** (2.378)	0.014** (2.388)	0.046* (1.748)
Capacity Utilisation	-0.038 (0.591)	-0.013 (0.591)	-0.066 (0.663)	-0.031 (0.981)	-0.009 (0.980)	-0.039 (0.995)
Tangible Assets	0.482* (1.671)	0.160* (1.704)	0.497 (0.993)	0.405*** (2.892)	0.118*** (3.070)	0.356** (1.987)
Educational level of staff	0.145 (0.570)	0.048 (0.571)	0.007 (0.021)	0.048 (0.394)	0.014 (0.394)	-0.015 (0.125)
Promotion-sales ratio	0.014 (0.331)	0.005 (0.331)	0.021 (0.357)	0.005 (0.225)	0.001 (0.225)	0.003 (0.134)
Formal firm	0.987*** (3.521)	0.328*** (3.591)	1.355** (2.539)	0.580*** (4.200)	0.169*** (4.339)	0.576*** (3.069)
African owner	1.034*** (3.223)	0.343*** (3.219)	1.332** (2.430)	0.507*** (3.287)	0.148*** (3.227)	0.493** (2.486)
Asian owner	0.519** (1.964)	0.172** (1.965)	0.681 (1.505)	0.241* (1.847)	0.070* (1.847)	0.237 (1.466)
Location in Nairobi or Mombasa	-0.406** (2.211)	-0.134** (2.205)	-0.663** (1.998)	-0.186** (2.138)	-0.054** (2.121)	-0.242** (2.075)
Outward-orientation	0.305 (1.196)	0.101 (1.193)	0.478 (1.131)	0.175 (1.461)	0.051 (1.458)	0.188 (1.216)
Food	-0.225 (1.041)	-0.075 (1.040)	-0.377 (0.967)	0.023 (0.219)	0.007 (0.219)	-0.023 (0.160)
Wood	0.057 (0.266)	0.019 (0.266)	0.019 (0.049)	0.120 (1.168)	0.035 (1.174)	0.102 (0.688)
Textile	-0.324 (1.564)	-0.108 (1.561)	-0.492 (1.302)	-0.079 (0.800)	-0.023 (0.799)	-0.079 (0.571)
1994	-0.264 (1.550)	-0.088 (1.548)	-0.414* (1.820)	-0.124 (1.515)	-0.036 (1.509)	-0.153** (2.057)
1995	-0.368** (2.107)	-0.122** (2.105)	-0.502** (2.100)	-0.202** (2.416)	-0.059** (2.407)	-0.211** (2.456)
N / Firms	455/221	-----	455/221	455/221	-----	455/221
R^2 [a]	0.62	-----	0.68	-----	-----	-----
Log-Likelihood	-229.09	-----	-222.13	-254.25	-----	-245.31
Joint $\beta = 0$ [b,c]	118.72***	-----	95.13***	113.33***	-----	95.45***
Heteroscedasticity [d,e]	1.31	-----	-----	11.20	-----	-----
Sample Selection [f]	-0.63	-----	-----	-----	-----	-----
Pooled vs. Panel [g]	-----	-----	19.63***	-----	-----	17.88***

Note: ***, **, and * indicate significance at 1 %, 5 %, and 10 % respectively. N = number of observations. Absolute t-values are in parenthesis. Marginal effects are evaluated at the variable means. CS = cross-section, RE = random effects.

[a] For Probit: Zavoina and McElvey's (1975) pseudo R^2 [b] For CS Probit: Wald test of slope parameters jointly zero, χ^2[df] [c] For RE Probit: Likelihood ratio test of slope parameters jointly zero, χ^2[df] [d] Likelihood ratio test of H_0: No heteroscedasticity, χ^2[df] [f] T-test of H_0: Correlation coefficient $\rho = 0$, t[df] [g] Likelihood ratio test of H_0: Pooled, χ^2[df]