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HOW DO SMALL FIRMS IN DEVELOPING COUNTRIES RAISE CAPITAL? EVIDENCE FROM A LARGE-SCALE SURVEY OF KENYAN MICRO AND SMALL SCALE ENTERPRISES (MSEs)[#]

by

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ABSTRACT

This paper utilizes a unique comprehensive dataset, drawn from the 1999 baseline survey of some 2000 micro and small-scale enterprises (MSEs) in Kenya. We analyse the financing behaviour of these enterprises within the framework of a heterodox model of debt-equity and gearing decisions. We also study determinants of the success rate of loan applications. Our results emphasize three major findings. First, MSEs in Kenya obtain debt from a wide variety of sources. Second, debt-equity and gearing decisions by MSEs and their success rates in loan applications can all be understood by relatively simple models which include a mixture of conventional and heterodox variables. Third, and in particular, measures of the tangibility of the owner's assets, and the owner's education and training have a significant positive impact on the probability of borrowing and of the gearing level. These findings have important policy implications for policy-makers and entrepreneurs of MSEs in Kenya.

JEL Classification: G32, O16, O17

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Keywords: Kenya, micro and small scale enterprises, debt and equity

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1. Introduction

Considerable attention has been paid in the last decade to the problem of poverty-reduction in developing countries. (World Bank, 1989, 1997) It is generally agreed that the development of micro and small scale enterprises (MSEs) can be a key ingredient in poverty-reduction (Sen, 1980). However, MSEs generally suffer from a range of problems in their establishment and development. Among these problems, we would argue that finance is perhaps the most central. A recent World Bank study found that about 90 per cent of small enterprises surveyed stated that credit was a major constraint to new investment (Parker, Riopelle and Steel, 1995). *A priori*, it might seem surprising that finance should be so important. Requirements such as identifying a product and a market, acquiring any necessary property rights or licenses, and keeping proper records are all in some sense more fundamental to running a small enterprise than is finance. However, potential providers of finance, whether formal or informal, are unlikely to commit funds to a business which they view as not being on a sound footing, irrespective of the exact nature of the unsoundness. Lack of funds may therefore be the immediate reason for a business failing to start or to progress, even when the more fundamental reason lies elsewhere. In this sense therefore, we would argue that finance is the "glue" that holds together all the diverse aspects involved in a small business start-up and development.

Cook and Nixson (2000) have recently surveyed the literature on finance for MSEs. They observe that most extant research on MSEs is concerned with the industrial countries. There is much less literature on developing countries, in part because basic data availability is much sparser. They identify several key research questions which require investigation. Among these they particularly note that little is known about the relationships between the financing of MSEs and their ownership characteristics, size, and performance.

In this paper we take up the question of how finance is related to other aspects of small business. Specifically, we study the determinants of probably the most important financial decision of MSEs, that of how to raise capital for the business, distinguishing between the initial capital and any follow-up capital acquired for expansion or restructuring. We examine

this decision in the context of a large sample of MSEs in Kenya. Kenya's small enterprise sector forms an important part of the economy and available data suggests that, in the recent past, it has grown faster than the larger organized sector (Aboagye, 1986). Moreover, small enterprises tend to be more labour-intensive than large enterprises (Snodgrass and Biggs, 1995). Thus, a lot is expected of Kenya's MSEs in the fight against poverty and there is considerable interest in research that can enlarge the pool of information to help inform policy towards MSEs. More precisely, in our research, we seek to identify first, the factors which lead Kenyan MSEs to borrow, whether from formal or informal sources, as against using equity; second, the determinants of the gearing rate which they actually employ; and third, the determinants of their success rate in applying for loans.

To analyse the financing behaviour of small enterprises in Kenya we set up and test an eclectic but heterodox empirical model of the capital structure and financial decisions of MSEs. The model is heterodox because it includes a wide range of variables not typically included in conventional financial models. See Prasad, Green and Murinde (2001) for a survey of such conventional models. In the first part of the analysis, we use the full sample of firms in our dataset to investigate the determinants of MSEs' debt-equity decisions, which we study using a binary choice model. We hypothesize that heterodox factors will be important in determining whether or not MSEs are able to get a loan to start up their business, and further that heterodox factors may decrease in importance as the business gets established and seeks further capital. Heterodox factors include *inter alia* variables representing ownership, the market, and the education, property rights and book-keeping skills of the owners and managers. Thus the analysis also explores the relationship between the "glue" of finance and the component parts of the businesses which we conjecture are held together by this glue.

In the second part of the analysis we use the full sample of data to examine the determinants of gearing, ie. the ratio of outstanding debt to debt-plus-equity. In theory, we would expect these determinants to be broadly similar to those of the gearing decisions for initial and additional capital examined in the first part of the analysis.

Third, we turn more specifically to debt decisions. It transpires that only a small number of MSEs in the dataset (exactly 100) did in fact apply for a loan to finance their capital in the recent past. We therefore study this sub-sample directly, and model the determinants of the "success rate" in the debt market, ie. the ratio of the loan received by a firm to the amount for which it applied[1].

Our dataset permits a much broader analysis of these issues than is usually possible. We rely on a unique comprehensive dataset, which contains a vast amount of information about the financing behaviour of MSEs in Kenya. Drawn from the 1999 baseline survey of MSEs in Kenya, the dataset consists of 2000 businesses, which form the basis for the analysis reported in this paper. The data, which we describe in more detail below, consist of answers to a wide range of qualitative and quantitative questions put to MSEs during 1999. The data do not include detailed accounting information, but they do include numerous other indicators of the nature of each business and its financial, operating, and ownership characteristics.

In summary, this paper includes a number of important innovations. First, in the dataset we use; second, in the application of a heterodox model of financial decisions; third, in the examination of the differences in decision-making between new and established businesses; and fourth, in a systematic study of the determinants of the success rates of loan applications by small businesses.

The rest of the paper is organized as follows. In section 2 we briefly describe the MSE sector in Kenya and the survey data which we use in our analysis. Section 3 sets out the model and the empirical methods we use to analyse these data. Section 4 contains the main empirical results. Concluding remarks appear in section 5.

2. Kenya's Micro and Small Enterprise Sector

2.1 MSEs in Kenya

Early research treated small enterprises as peripheral survival mechanisms whose developmental impact was marginal (Ongile and McCormick, 1996). This view was

irrevocably changed by the 1972 International Labour Organisation report that demonstrated the significant employment and wealth creation potential of the burgeoning, and often informal, small enterprise sector (ILO, 1972). Since the ILO report, the general outlook towards MSEs has shifted dramatically. Benign neglect has been replaced by a recognition that the sector could be the lynchpin for improving economic prospects in the developing world (King, 1996). But the shift after the 1970s also benefitted from a heightened realisation that a high and rising share of industrial employment was still in the small enterprise sector. Previous slanting of government policies towards promotion of large, capital intensive industry meant that the potential for inducing more efficient use of capital and improving income distribution lay in more neutral policies. MSEs also link closely with agriculture so that their promotion would be part of an agriculture-led development strategy. As compared with large enterprises, MSEs are invariably more labour-intensive and often more efficient. Indeed, labour-intensive production tends to be more efficient where labour is plentiful and capital scarce, which is frequently the case in developing countries (Snodgrass and Biggs, 1995). MSEs promote more equitable distribution of income because they are more labour-intensive than larger enterprises, and because owners of small businesses are more likely to be poorer than the owners of large businesses. Small enterprises also nurture entrepreneurs who may eventually expand their firms and move to high value adding activities.

The Kenyan MSE sector is mixture of self-employment outlets and dynamic enterprises involved in an array of activities that are concentrated in urban areas but are also evident in rural Kenya. There are about 1.3 million establishments employing 2.3 million individuals and generating as much as 14% of the country's GDP (Mullei & Bokea, 1999). A majority of these small enterprises are sole proprietorships; a third of the enterprises operate from homes; and one half are female-owned. According to recent research, female-owned small enterprises are more likely to be informal, usually start smaller, use less start-up capital, grow slower if at all, have more limited access to credit and more often operate from less permanent premises and homes (Parker & Torres 1994, Kimuyu & Omiti 2000).

Through the small enterprise sector, unskilled rural migrants acquire skills needed for survival in the more challenging urban environment. The sector also attracts skilled persons retrenched from formal sector jobs, and is often regarded as a second-best option for those unable to find or to keep jobs in the modern sector. The size of an MSE's total labour force varies widely across business establishments and activities. However, the two key components of the labour force are entrepreneurs and apprentices. Informal garages absorb appreciably more apprentices and workers than the formal service sector that is dominated by proprietors. In the recent past, employment growth in Kenya's small enterprise sector has far outpaced growth in the larger modern sector (Aboagye, 1986). However, many MSEs still require workers with skills that school leavers often lack, and therefore the small enterprise sector is not likely to solve Kenya's daunting unemployment problem on its own (Ongile and McCormick, 1996).

Although most small enterprises are younger than the large ones, their ages vary across locations and activities. For the informal small businesses, the first two years are critical for survival since mortality rates are highest around this age. In many sectors, lack of entry barriers creates severe competition that leads to the demise of the less efficient and poorly managed enterprises. However, there are higher capital and skill requirements in construction and vehicle garages, and these act as effective entry barriers so that there is less competition in these sub-sectors.

2.2 The National Sample Survey and Evaluation Programme

This paper uses data from the 1999 baseline survey of micro and small scale enterprises in Kenya. The baseline survey was based on a survey that drew from the Central Bureau of Statistics' National Sample Survey and Evaluation Programme (NASSEP) III sampling frame. The selection of clusters followed a primary stratification that distinguished between different households based on economic and demographic characteristics. The Kenya Governement (1993) reports information about the 1993 survey. Results from this survey were used to determine sample sizes in each stratum while area maps were used to determine the enumeration areas. In the end, a total of 1500 households were sampled. All adult members of

the households on the survey sites were interviewed using a structured questionnaire and the module for information on enterprises administered on households with non-agricultural businesses. These procedures generated a sub-sample of about 2000 businesses whose data are used in the analysis reported in this paper.

The survey gives separate categorical information about the main source of the initial capital for the business and any additional capital. It does not give quantitative data on the main source of capital by category. It does provide quantitative data on total initial capital and total additional capital, but there is no categorical data on total capital, only the main source is categorized. As shown in table 1, responses to the questions, "What was the main source of initial (or additional) capital [for the enterprise]?" were classified into equity (family or own funds) or one of 10 categories of debt. There are some ambiguities in the coding of these and other responses. For example, there may be missing observations either because MSEs did not require any start-up or additional capital or because of a non-response to the question. An important conclusion from table 1 is that relatively few MSEs have financed their capital with debt, and fewer still have used lenders outside the family for this purpose: just 4% of all firms raised their initial capital in the form of debt from outside the family; and 3% raised additional capital this way, although only about 25% of firms are identified as having raised any additional capital at all.

Table 1 about here

Table 2 summarizes the main quantitative data on the overall gearing rates of firms in the sample. Gearing is defined as the ratio of total debt to total debt-plus-equity, where the total is defined to include both initial and additional capital. There is an ambiguity in the gearing measure in that it is not clear from the context of the questions whether firms would necessarily include loans taken out in the last 12 months within their debt total. This would depend in part on when the last accounts were struck from which, formally or informally, firms were reporting the value of their debt and equity. As can be seen from table 2, adding in recent loans to the

debt total (*GEAR1*) makes some difference to the distribution of the gearing rates. Fewer firms had a diversified capital structure according to the *GEAR2* measure (excluding recent loans) than according to *GEAR1*. Therefore we separately analysed both measures of gearing and compared them with one another and with the binary model of debt-equity decisions. Overall though, table 2 confirms the information in table 1 that relatively few Kenyan MSEs have borrowed to raise capital.

Table 2 about here

Table 3 shows the success rates of those firms which did apply for a loan during the year preceeding the survey. Two points are worth noting from these data. First, it would appear that where credit rationing occurs, there are almost as many instances of "all-or-nothing" rationing as there are of partial rationing: 19 enterprises got no credit, while 22 received some credit, but not all they had applied for. The theory of credit rationing generally suggests that a reduction in the size of the loan (rather than an outright refusal) is an effective screening device for lenders. See Freixas and Rochet (1998) for a review. Of course, the enterprises which were refused credit may also have had insufficient collateral or other observable charactersitics leading to refusal of the loan. A second tentative conclusion is that borrowers had more success with co-operatives than with any other form of institutional lender. It is particularly noteworthy that applicants to Rotating Credit Societies (ROSCAs) had a lower success rate. ROSCAs are usually thought of as having particularly good knowledge about their members. These data suggests that there may be important differences in credit-granting capabilities and policies among different micro-credit institutions. See Morduch (1999) for a review of these issues. However, we would re-emphasize that this sample is too small for us to draw more than tentative conclusions at this stage.

Table 3 about here

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3. The models

3.1 Debt v Equity

In a recent survey of the literature on capital structure in developing economies, Prasad, Green and Murinde (2001) evaluate a range of competing models for studying capital structure issues. In the light of these models and in view of the features of MSEs in Kenya, we specify the following general model:

$$y_n = \sum_k \beta_k X_{kn} + \varepsilon_n \qquad \ldots 1$$

The endogenous variable, y_n ($n = 1,...,N$), is a measure of the main source of capital of the nth MSE. The X_{kn} ($k = 1,...,K$) are company-specific explanatory variables, and ε_n is the error term. The endogenous variable is binary and is defined as:

$$y_n = \begin{cases} 1 & \text{if main capital is debt} \\ 0 & \text{if main capital is equity} \end{cases}$$

As shown in table 1 "equity" is defined as own or non-interest-bearing family funds; "debt" includes all other sources of funds. Thus the model seeks to explain the debt-equity decision by MSEs; and equation (1) could be interpreted loosely as a (binary) demand function for debt. We set up our heterodox model with explanatory variables (X_k) discussed below. Equation (1) was then estimated twice: first to explain the initial capital decision, and second to explain the decision on additional capital. To economise on space we call these the ***IC*** and ***AC*** regressions, respectively. At the first stage, we used the same explanatory variables in the two regressions. We then used t-tests and likelihood ratio tests to compare the coefficients in the two regressions, and to test the hypothesis that there would be differences between the factors determining the *IC* decision and those determining the *AC* decision. We also tested down to delete insignificant variables wherever possible. Since y_n is a binary variable, we used the probit method to estimate (1).

Table 4 about here

The explanatory variables of the model are shown in table 4, together with their definitions and hypothesized signs in the regression. Although most of the variables in the regression are heterodox in nature, many can be given an interpretation in terms of the standard corporate finance literature. Therefore, in explaining the rationale for these variables and for their hypothesized signs, we do not attempt to present a grand new alternative theory or theories. Instead, we seek wherever possible to place them in the context of conventional theory, and to discuss the ways in which they depart from conventional theory.

AGE is a standard measure of reputation in capital structure models. As a firm ages, it establishes itself as a continuing business and it therefore increases its capacity to take on more debt; hence age is positively related to debt. See Wiwattanakantang (1999). In our data however, all MSEs started up at *AGE*=0 by construction. Therefore a negative sign may be likely in the *AC* regression, but in the *IC* regression, *AGE* is a retrospective variable whose sign is uncertain.

The next group of variables (***WFEMALE, WOWNER, WUAGE, WFUAGE***) are those which give the basic ownership characteristics of gender, participation and age. These are included in the model to control for these basic characteristics of MSEs. There is little theoretical guidance as to the likely signs of the specifically gender-related variables. The estimated signs may provide a hint about possible discrimination, but since it is generally established in the literature that women in developing countries often make active use of informal financial schemes, such as ROSCAs, even this hypothesis is not very sharp. See Matin, Hulme and Rutherford (1999). However, it would seem likely that under-age owners would have more difficulty obtaining credit than their older competitors, especially from outside the family, and we therefore suggest that *WUAGE* and *WFUAGE* are both likely to have a negative sign.

EDUC and ***TRAIN*** are educational variables and we would expect these to be positively related to debt on the grounds that better-educated owners would find it easier to present a plausible case for a loan to an outside body. This would be particularly important if the owner had no book-keeping knowledge.

FAMILYB and ***SOLEP*** are ownership variables. The corporate finance literature is inconclusive about the influence of ownership on gearing. On the one hand, agency theory would suggest that family owners and owner-managers prefer lower gearing to reduce the risk of their portfolios in the firm; on the other hand, monitoring costs are lower in the presence of relatively few large shareholders, and this should increase gearing. The empirical evidence is also inconclusive. See Prasad, Green and Murinde (2001).

In the Kenyan context, ***OWNLAND*** and ***PERM*** are likely to have an important impact on any MSE's ability to borrow. Indeed, these variables can be interpreted within the corporate finance literature as measures of asset tangibility reflecting an enterprise's ability to provide collateral. However, it could also be argued that ownership of or ability to rent tangible assets is an indicator of wealth. Arguably, more wealthy individuals would be more likely to use their own equity, at least to start a business, possibly borrowing on their tangible assets when seeking additional capital. Thus the anticipated signs of *OWNLAND* and *PERM* are ambiguous.

FORMAL and ***BUSREGLA*** are indicators of the extent to which the business is an ongoing enterprise and not for example someone who makes irregular appearances by the roadside to wash car windscreens or a seasonal vendor of vegetables. As for *OWNLAND* and *PERM*, these variables may indicate an established business which is more easily able to borrow, or a business which is established because of the owner's wealth and which therefore has less need to borrow. On balance though, the former appears more plausible in this case, implying a possibly positive sign.

URBAN is included to check for the possibility that it is easier to obtain credit in urban areas. However, we have no prior beliefs about this and the hypothesized sign is therefore ambiguous.

INC and ***SIZE*** can be interpreted as conventional corporate finance variables. Theory is again ambiguous in its guidance on the signs of these variables. Larger and more prosperous firms are probably more diversified and less risky (respectively) than smaller and less prosperous firms. This suggests they should use more debt and less equity, ceteris paribus. However, it is

also argued that large firms are less transparent and therefore their borrowings cannot be monitored so easily, implying a lower debt ratio. High income may reflect high growth opportunities and may therefore also be associated with a lower debt ratio to reduce the risk that profitable investments may have to be passed over. See Prasad, Green and Murinde (2001) on these points. In the MSE contest these are relatively abstract points. However, there does exist the same ambiguity as before in that *INC* and *SIZE* could reflect either ability to borrow (high: suggesting a positive sign) or need to borrow (low: suggesting a negative sign).

GOOD and ***POOR*** provide more distinctively heterodox performance measures, judged not by income (which is not available for all companies in the sample), but by the owner's self-assessment. Since this assessment has much to do with the owner's view about whether (s)he is likely to be able to obtain a loan, we tentatively expect a positive sign on *GOOD* and negative on *POOR*.

KEEP refers to book-keeping. Proper bookkeeping will almost certainly improve the chances of the owner being able to borrow, and is a necessity for dealing with a formal financial institution. We could again interpret this variable in a corporate finance context as reflecting transparency. On either interpretation, the expected sign is positive.

Finally we control for the general type of activity in which the business is engaged. The survey provides a distinction between businesses engaged in primary activities (agriculture, forestry and fishing) and those in secondary (manufacturing and services). ***PRIMARY*** is a dummy for all businesses engaged in primary activities. The traditional literature would suggest that firms with less specialized capital are more able to borrow because they have lower bankruptcy costs. However, it is difficult to apply this idea directly to the relatively coarse classification available. We tentatively suggest that, in poor countries, capital in primary activities is likely to be more adaptable and have higher liquidation value than that in secondary activities. This would suggest a positive coefficient, but one could equally well argue that the reverse may be true.

3.2 Gearing

In the second part of the analysis we study the determinants of firms' gearing. Gearing is defined as the ratio of debt to debt-plus-equity outstanding at the time of the sample survey. It is important to re-emphasize that gearing as measured here is not simply an elaboration of the binary dependent variable in the debt *versus* equity regressions. The model of section 3.1 refers to the main source of a firm's capital. For this, we have categorical data, but not quantitative data. In this section we are concerned with a firm's total capital. For this we have quantitative data but not categorical data. See the discussion in section 2.2.

The model to be estimated has the same form as equation (1), except than y_n is now to be interpreted as one of the gearing measures shown in table 2, and is not a binary variable. The independent variables are the same as before since we expect the same factors to influence gearing as influence the binary debt-equity decision. However, it is clear from table 2 that the gearing of MSEs is heavily concentrated at unity and (more particularly) at zero. Under 7% of the sample firms have both debt and equity outstanding according to the ***GEAR1*** measure; under 4% according to ***GEAR2***. To take account of the heavy weights at zero and unity, we used the two-limit Tobit model with truncation at zero and unity to estimate equation (1). Maximum likelihood estimation was used. The likelihood function and its properties are set out in several standard texts, such as Maddala (1983), ch. 6.

3.3 Success Rates of Loan Applications

In the third part of the analysis we concentrate on the 100 firms which applied for a loan during the one year prior to that in which the survey was undertaken. Specifically, we use the same explanatory variables as before to model the determinants of the "success rate" in the debt market, ie. the ratio of the loan received by a firm to the amount applied for. The general empirical set-up is the same as equation (1), except that y_n is now the success ratio (***SUCCR***). However, as is the case for gearing, a substantial proportion of the observations on y_n in this sample are equal to either zero or unity (78% in total; see table 3). To take this into account,

we again estimate the model using the two-limit Tobit estimator, with the limits set at zero and unity.

The *SUCCR* equation has to be interpreted somewhat differently from the four debt equations which we estimate (*IC*, *AC*, *GEAR1* and *GEAR2*), even though the postulated explanatory variables are the same in all the equations. The debt equations might each be interpreted as demand functions for debt by individual firms, or perhaps as reduced-form estimates of the debt decision. However, the success rate of firms in the loan market depends in large part on the lender, although as we have argued and the literature emphasizes, lenders' decisions depend in their turn on the observable and inferred characteristics of borrowers (Freixas and Rochet, 1998). Thus we interpret the *SUCCR* equation as a (reduced-form) screening equation which describes loan outcomes as a function of firm characteristics. The anticipated signs of the coefficients are the same as in the debt equations because we postulate that the debt decison for MSEs will be intimately related to their chances of success in the loan market.

4. Empirical Results

We followed the same broad strategy in estimating the three models. First we estimated a general model, and then we tested down to a simplified model, deleting insignificant variables. Given the qualitative nature of most of the data, we adopted a relatively cautious critical region of 25% for both the t-tests and the likelihood ratio tests[2]. Moreover, for the *IC* and *AC* equations we tested down two different routes, as we explain in section 4.1 below. For the record, table 5 gives the results of estimating the general model for all 5 equations: the debt-equity decision (*IC* and *AC*), gearing (GEAR1 and GEAR2), and the success rate equation. Only about one-sixth of the coefficients are significant in any of the equations, although this is to be expected given the rather general nature of the model, and that most of the variables are 1-0 dummies. FORMAL and GOOD appear to be significant in several of the models. Nevertheless, we can see from the likelihood ratio tests in table 5 that, notwithstanding the low *t* statistics and correlation coefficients, each model as a whole does contribute significantly to

explaining MSEs' financial decisions: debt-equity, gearing, and loan success rates. We therefore turn next to hypothesis testing which we discuss on a model-by-model basis.

Table 5 about here

4.1 Debt v Equity

The first step in hypothesis-testing was to examine how far decisions on initial capital could be differentiated from those on additional capital. We proceeded by testing the equality of coefficients on any given explanatory variable as between the *IC* and *AC* equations using t-tests. We then used the likelihood ratio to test groups of coefficients accepted as being pairwise equal by the t-tests. To keep the presentation compact, table 6 just shows the results of the likelihood ratio tests. Given the rather low explanatory power of the initial regressions, it is perhaps not surprising that 15 out of 20 slope coefficients will accept an equality restriction as between the *IC* and *AC* equations. Only *AGE*, *EDUC*, *FAMILYB*, *PERM*, and *FORMAL* have a different effect on the *IC* and *AC* decisions. The result for *AGE* is reassuring as we did hypothesize a difference because of the ambiguity involved in interpreting its effect on *IC*. For other variables we had few prior beliefs about possible differences between *IC* and *AC*. We then tested down from the joint model of *IC* and *AC* decisions and, as shown in table 6, were able to delete 12 of the 15 variables restricted to the same parameter values in the *IC* and *AC* equations and a further 4 variables from the *AC* equation (*EDUC*, *FORMAL*, *AGE* and *FAMILYB*). Thus the data will accept a total of 31 restrictions.

Table 6 about here

Of course, it is possible to test down by a different route, by first simplifying each equation separately and then testing the equality of coefficients on any given explanatory variable as between the separately-simplified *IC* and *AC* equations. Proceeding in this way, a total of 32

restrictions are accepted, as shown in table 6. While this methodology is likely to (and does) yield two slightly different models, the differences between them give an indication of the robustness of the underlying results. The coefficient estimates for the two simplified versions of the *IC* and *AC* equations are shown in columns 1 and 2 of table 7.

Table 7 about here

In fact, an important feature of table 7 is that there are few major differences between the two versions of the debt-equity model, simplified along two different paths. The coefficients remaining in the model after simplification are surprisingly well-determined and tell a clear and interesting story about the determinants of the capital-raising decisions of Kenyan MSEs. In both models, *AGE* appears to have a negative influence on the probability of incurring debt in the *IC* equation, and no impact in the *AC* equation. Since *AGE* is a retrospective variable in the *IC* equation, this implies that older firms were more likely to raise their initial capital in the form of equity. This suggests that borrowing has become a more viable option for firms established in the more recent past, in other words, that the availability of credit for small businesses has improved over time. *EDUC* is positively signed as expected, implying that more educated owners do have greater possibilities of borrowing. This is also true for *TRAIN*, although there are some differences between the two models as between *IC* and *AC*. Overall, the level of education appears to have an important positive impact on MSEs' debt-raising capacities. *FAMILYB* tends to be negatively associated with debt. Although this variable could have either sign, it is perhaps not surprising to find that small family-owned businesses are more likely to avoid debt. Indicators of tangibility (*OWNLAND* and *PERM*) are clearly important, and firms with these attributes are, as expected, generally more likely to incur debt, but for *AC* rather than *IC* where *PERM* has a counter-intuitive negative sign. It is noteworthy that *FORMAL* contributes positively to debt in the *IC* equation, but not in the *AC* equation. This suggests that if an enterprise is not yet up and running, it is less likely to borrow if it is not constituted as a formal business, but once it is up and running, its formal status is immaterial to

the debt decision. Finally, *INC* and *GOOD* are clearly very significant, with higher-income businesses more likely to incur debt, but firms which are self-assessed as above-average being less likely to incur debt. It is interesting that these two variables have opposite signs in all the equations. This suggests that there may be an important difference between MSEs' perceptions of their own relative performance and their actual absolute performance. Firms which are large in some absolute sense, measured by high net income, may have more debt. But, firms which perceive that they are performing well relative to their peers, have less debt.

Overall, variables which are indicative of the permanence of the business, the level of education of the owner, and general performance of the business seem to be most important in determining MSEs' debt-equity decisions, both for initial capital and additional capital. Clearly, there are quantitative differences between the coefficients in the *IC* and *AC* equations, but there are no sign differences, although some variables do appear in one equation but not the other. This suggests that there are relatively few substantive qualitative differences among financing decisions, as between MSEs' business start-ups and established MSEs. If there are problems involved in start-ups, these results would suggest that, in general, they are also likely to be present for established businesses.

4.2 Gearing

Columns 3 and 4 of table 7 show the two simplified models of gearing. It is very striking and reassuring that almost all the same varibles which are significant in the *IC* and *AC* models are also significant in the gearing models. Moreover, all these variables have the same signs in the gearing models as they do in the *IC* and *AC* models: *EDUC*, *TRAIN*, *FAMILYB*, *FORMAL*, *INC* and *GOOD*. This strongly suggests that the model and the underlying influence of these variables on debt-equity and gearing decisions are both very robust. There are some differences. *WFUAGE* does not appear in the *IC* and *AC* models but it is present in the gearing model, and with a positive sign. This is hard to rationalize and and may just be an anomaly in the data. *OWNLAND* and *PERM* are in the *IC* and *AC* models, but do not appear in the gearing model. This is more reasonable as it suggests that tangibility is a factor in the debt-equity

decision but not in the exact level of gearing which is decided on by the MSE. The non-appearance of *AGE* in the gearing equation is consistent with its non-appearance in the *AC* equation.

4.3 Loan applications and decisions

Finally, column 5 of table 7 gives the results of the screening equation for loans. With some exceptions, the coefficients are plausibly signed and significant. The positive impact of *OWNLAND* and *PERM* reinforces the tangibility argument made earlier. The negative impact of *AGE* is consistent with general corporate finance arguments, although it is perhaps surprising that there is therefore no effect of *AGE* on *AC* or on gearing. The negative effect of underage ownership (*WUAGE*) is also consistent with our hypotheses. Other signs are harder to rationalize however: the positive sign on *WFUAGE*, and the negative signs on *BUSREGLA* and on *KEEP*. The negative sign on *PRIMARY* is contrary to our tentative hypothesis, but this hypothesis was tentative and the negative sign may suggest that credit agencies view primary production as more risky than manufacturing.

Evidently there are some important similarities and differences as between the screening equation and the debt equations. *OWNLAND* and *PERM* are significant in *SUCCR* as well as in the debt-equity decision, suggesting that conventional tangibility factors are important in all aspects of debt decisions, from the point of view of both borrower and lender. It is also interesting that *EDUC*, *TRAIN* and *INC* are important in the overall debt-equity decision but not in the *SUCCR* equation. This, combined with the counter-intuitive signs on *BUSREGLA* and on *KEEP* in the SUCCR equation suggest that there may be an element of self-selection in loan applications. If in general, some education and book-keeping are regarded as a *sine qua non* for making a loan application, the decision as to whether to grant the loan and for how much, may depend on other factors. Alternatively, educated owners keeping regular accounts may be over-confident in their loan applications and apply for more than they can reasonably expect. Less-well educated owners with less formal businesses may be more cautious, and therefore enjoy a better success rate. Clearly there is more work to be done on this topic.

5. Concluding Remarks

Although our results must be regarded as preliminary, they emphasize four findings. First, MSEs in Kenya obtain debt from a wide variety of sources especially family and friends, but including also co-operatives, banks, ROSCAs, NGOs, and other financial institutions. Second, the debt-equity and gearing decisions of MSEs and their success rates in loan applications are susceptible to being understood by relatively simple models which include a mixture of conventional and heterodox variables. Third, there is some tentative evidence that the availability of credit for small business may have improved over time. Fourth and finally, the main key determinants of debt and loan screening decisions are a mixture of conventional and heterodox variables. Among the conventional variables, measures of the tangibility of the owner's assets, and objective and subjective measures of income are particularly important, both in the debt and in the screening decisions. Among the more heterodox variables, the level of education and training of the owners have a significant positive impact on the probability of borrowing and of the resultant gearing level. Moreover, a comparison between the screening regression and the debt regressions would suggest that there may be some degree of self-selection in the loan application process. All these findings have important policy implications for policy makers and entrepreneurs of MSEs in Kenya. Clearly, further research on these issues is necessary.

Footnotes

1. By "recent past" we mean the one year preceeding that in which the survey questions were asked. The success rate data are confined to those firms which applied for a loan during that period.
2. The t tests were set up as two-tailed tests, and the χ^2 tests as one-tailed tests.

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Table 1: MSEs: Main Source of Capital
(no. of firms)

Main Source of Capital	**Initial Capital**	**Additional Capital**
Equity		
Family or own funds	1591	365
Debt		
Loan from family/friends (not free)	125	28
Money-lender	8	1
Bank	13	8
Non-bank credit institutions	13	5
Rotating credit societies	12	5
Government	3	3
NGOs	2	3
Formal/informal co-operatives	21	6
Trade credit	4	3
Other	3	27
Missing observations	162	1503
Total	**1957**	**1957**

Table 2: MSEs: Capital Structure
(no. of firms)

	GEAR1	**GEAR2**
GEAR=0	1441	1492
GEAR=1	168	166
0<GEAR<1	118	67
All firms	1727	1725

Notes:
GEAR = total debt/(total debt + total equity);
total debt or equity = initial capital + additional capital
GEAR1: Loans received in previous year added to debt data
GEAR2: Loans received in previous year assumed to be included in debt data

Table 3: MSEs: Main source of credit applied for and success rate of applications (no. of firms)

Main source of credit applied for during preceeding year	**Success rate of application**			**All firms**
	none	**partial**	**full**	
Family/friends	1	1	3	5
Money-lender	1	1		2
Bank	1	6	4	11
Non-bank credit institutions	4	3	9	16
Rotating credit societies	1	3	5	9
Government	1		3	4
NGOs	5	4	20	29
Formal/informal co-operatives		2	10	12
Trade credit			3	3
Other		2	2	4
Missing observations	6			5
Total	**20**	**22**	**59**	**101**

Notes:

1. *Success rate of application:*
   None: credit refused by lender
   Partial: credit granted but amount less than that applied for
   Full: credit granted equal to that applied for
2. For one business, there is data on the source of credit applied for but not on the amounts applied for or received. This business applied to a bank for credit, and for the purpose of this table it is assumed that the success rate of this business was "none". However, when modelling the determinants of the success rate, this business is excluded from the sample.

Table 4: Explanatory Variables of the Debt-Equity Model and their Hypothesized Signs

Mnemonic	Explanatory Variables	Type of variable[1]	Hypothesized sign
AGE	Age of business	cont	±/+
WFEMALE	female working owner, aged 18+ years	1-0	±
WOWNER	Working owner, aged 18+ years	1-0	±
WUAGE	Working owner aged 5-17 years	1-0	-?
WFUAGE	Female working owner aged 5-17 years	1-0	-?
EDUC	Owner has secondary education	1-0	+?
TRAIN	Owner has trade certificates or above	1-0	+?
FAMILYB	Ownership type = family	1-0	±
SOLEP	Ownership type = sole proprietor	1-0	±
OWNLAND	Business owns land	1-0	±
PERM	Business housed in permanent structure	1-0	±
FORMAL	Business is a formal enterprise	1-0	+?
BUSREGLA	Business is a regular business	1-0	+?
URBAN	Business is urban-based	1-0	±
INC	Log of net income from business	cont	-/±
SIZE	Log of number of employees	cont	-/±
GOOD	Performance self-assessed as above average	1-0	+?
POOR	Performance self-assessed as below average	1-0	-?
KEEP	Business keeps a complete set of accounts	1-0	+
PRIMARY	Main economic activity is primary	1-0	±/+

Type of variable:
cont =continuous
1-0 = binary variable, equal to 1 when the condition specified for the explanatory variable is met, and 0 otherwise

Table 5: Estimates of General Models

	Probit models		**Two-limit Tobit models**		
	Debt-equity decision		**Gearing**		**Success rate**
	IC	***AC***	***GEAR1***	***GEAR2***	***SUCCR***
Constant	-1.434***	-3.077***	-4.343***	-6.840***	3.438*
	(-3.74)	(-5.61)	(-3.63)	(-3.29)	(1.95)
AGE	-0.009	0.004	0.012	0.001	-0.043
	(-1.44)	(0.65)	(0.76)	(0.04)	(-1.31)
WFEMALE	0.015	0.029	0.201	0.145	0.082
	(0.18)	(0.27)	(0.84)	(0.36)	(0.20)
WOWNER	-0.149	0.265	-0.133	-0.451	
	(-0.69)	(0.80)	(-0.20)	(-0.41)	
WUAGE	-0.361	0.007	-1.059	-2.109	-2.819*
	(-0.93)	(0.02)	(-0.99)	(-1.09)	(-1.75)
WFUAGE	0.612	-0.333	2.118*	3.505	2.159
	(1.36)	(-0.56)	(1.68)	(1.56)	(1.00)
EDUC	0.139	-0.035	0.302	0.451	-0.252
	(1.59)	(-0.31)	(1.23)	(1.08)	(-0.58)
TRAIN	0.049	0.206*	0.308	0.392	0.031
	(0.53)	(1.77)	(1.20)	(0.90)	(0.07)
FAMILYB	-0.225	0.110	-0.485	-1.292	-0.982
	(-1.39)	(0.51)	(-1.03)	(-1.62)	(-1.03)
SOLEP	-0.071	0.022	-0.215	-0.573	-0.876
	(-0.49)	(0.11)	(-0.51)	(-0.81)	(-0.95)
OWNLAND	-0.013	0.147	0.106	0.166	0.558
	(-0.12)	(1.09)	(0.35)	(0.32)	(0.98)
PERM	-0.135	0.108	-0.060	-0.232	0.994*
	(-1.34)	(0.876)	(-0.22)	(-0.49)	(1.91)
FORMAL	0.355***	0.003	0.691**	1.319**	-0.300
	(2.93)	(0.02)	(1.97)	(2.20)	(-0.50)
BUSREGLA	0.029	-0.039	-0.152	-0.125	-0.623
	(0.28)	(-0.28)	(-0.52)	(-0.25)	(-1.04)

	Probit models		Two-limit Tobit models		
	Debt-equity decision		Gearing		Success rate
	IC	***AC***	***GEAR1***	***GEAR2***	***SUCCR***
URBAN	0.059	0.061	0.116	0.206	0.168
	(0.69)	(0.52)	(0.47)	(0.49)	(0.38)
INC	0.040	0.128***	0.162*	0.242	-0.089
	(1.14)	(2.76)	(1.66)	(1.42)	(-0.58)
SIZE	0.075	0.066	0.275	0.509	-0.032
	(0.90)	(0.61)	(1.17)	(1.28)	(-0.08)
GOOD	-0.202*	-0.424***	-0.688**	-1.197**	0.516
	(-1.85)	(-2.84)	(-2.24)	(-2.23)	(0.90)
POOR	0.036	-0.138	0.020	0.058	0.097
	(0.40)	(-1.18)	(0.08)	(0.14)	(0.22)
KEEP	-0.022	-0.332	-0.353	-0.962	-0.781
	(-0.10)	(-1.09)	(-0.60)	(-0.93)	(-0.94)
PRIMARY	0.033	0.268	0.004	0.458	-2.504**
	(0.19)	(1.33)	(0.01)	(0.59)	(-2.34)
Std. Deviation	-	-	3.101***	4.958***	1.378***
			(11.47)	(8.47)	(4.98)
No of observations	1833	1833	1727	1725	96
R^2	0.02	0.02			
LR test	$\chi^2(20)$ = 37.54**	$\chi^2(20)$ = 31.78**	$\chi^2(20)$ = 34.79**	$\chi^2(20)$ = 34.68**	$\chi^2(19)$ = 20.49

Notes:

1. Figures in parentheses are t statistics
2. WOWNER is excluded from the SUCCR regression as its parameter is unidentified. Of the 96 firms included in the SUCCR regression, there are 4 with WOWNER=0; and in all these cases, the success rate is "full" (SUCCR=1).
3. The LR test is a likelihood ratio test for the null hypothesis that all slope coefficients are zero, distributed as $\chi^2(20)$. Critical values for $\chi^2(20)$ are: 28.41 (10%), 31.41 (5%), and 37.57 (1%). Exceptionally, the LR test is distributed as $\chi^2(19)$ in the SUCCR regression. (See note 2.) Critical values for $\chi^2(19)$ are: 27.20 (10%), 30.14 (5%), and 36.19 (1%).
4. * Significant at 10% level
   ** Significant at 5% level

*** Significant at 1% level

Table 6: Hypothesis Tests on Debt-Equity Decisions

Restrictions	χ^2	Likelihood ratio	Significance
1. Impose acceptable equality restrictions between the IC and AC equations *then* delete insignificant coefficients from the combined model			
1.1 Initial Capital v Additional Capital			
BUSREGLA, URBAN, SIZE	$\chi^2(3)$	0.1586	0.98
PRIMARY, OWNLAND, KEEP	$\chi^2(3)$	2.8768	0.41
WFEMALE, WOWNER, WUAGE, WFUAGE	$\chi^2(4)$	3.0981	0.54
TRAIN, SOLEP	$\chi^2(2)$	1.3276	0.51
INC, GOOD, POOR	$\chi^2(3)$	3.5009	0.32
1.2 Tests on parameters of combined model			
$WOWNER_R$, $BUSREGLA_R$, $EDUC_A$, $FORMAL_A$, $SOLEP_R$, $WFEMALE_R$, $POOR_R$, AGE_A, $OWNLAND_R$, $WUAGE_R$, $WFUAGE_R$, $KEEP_R$, $URBAN_R$, $FAMILYB_A$, $SIZE_R$, $PRIMARY_R$	$\chi^2(16)$	5.2495	0.99
2. Delete insignificant coefficients from the IC and AC equations separately, *then* impose acceptable equality restrictions between the simplified IC and AC equations			
2.1 Tests on parameters of individual equations			
$WUAGE_A$, $FORMAL_A$, $KEEP_I$, $SOLEP_A$, $OWNLAND_I$, $PRIMARY_I$, $WFEMALE_I$, $WFEMALE_A$, $BUSREGLA_I$, $BUSREGLA_A$, $EDUC_A$, $POOR_I$, $URBAN_A$, $SOLEP_I$, $TRAIN_I$, $SIZE_A$, $WFUAGE_A$, AGE_A, $WOWNER_I$, $URBAN_I$, $FAMILYB_A$, $WOWNER_A$, $SIZE_I$, $WUAGE_I$, $KEEP_A$, $PERM_A$, $WFUAGE_I$, $POOR_A$, $PERM_I$, $PRIMARY_A$	$\chi^2(30)$	14.1614	0.99
2.2 Initial Capital v Additional Capital			
INC_R, $GOOD_R$	$\chi^2(2)$	3.0299	0.22

Notes:

The subscripts indicate the following:

$_R$ = the equality of the pairwise coefficients in the *IC* and *AC* models was imposed

$_I$ = the coefficient relates to the *IC* model

$_A$ = the coefficient relates to the *AC* model

Table 7: Simplified Models

	Probit models:Debt-equity decision				**Two-limit Tobit models**		
	1. Model from test route 1 (see table 6)		**2. Model from test route 2 (see table 6)**		**Gearing**		**Success rate**
	1		***2***		***3***	***4***	***5***
	IC	***AC***	***IC***	***AC***	***GEAR1***	***GEAR2***	***SUCCR***
Constant	-1.825***	-2.331***	-1.843***	-2.373***	-4.561***	-7.683***	2.087***
	(-8.75)	(-10.78)	(-8.91)	(-10.86)	(-5.54)	(-4.98)	(3.84)
AGE	-0.009		-0.009				-0.039
	(-1.45)		(-1.53)				(-1.41)
WUAGE							-2.789**
							(-2.14)
WFUAGE					1.096	1.600	2.045
					(1.54)	(1.31)	(1.15)
EDUC	0.127		0.129		0.274	0.536	
	(1.51)		(1.56)		(1.16)	(1.35)	
TRAIN	0.107	0.107		0.208*	0.320		
	(1.52)	(1.52)		(1.91)	(1.26)		
FAMILYB	-0.165*		-0.175*			-0.812*	
	(-1.65)		(-1.76)			(-1.68)	
OWNLAND				0.182			0.571
				(1.46)			(1.12)
PERM	-0.137	0.163					0.639
	(-1.40)	(1.46)					(1.54)
FORMAL	0.337***		0.303***		0.737**	1.388**	
	(2.90)		(2.71)		(2.22)	(2.45)	
BUSREGLA							-0.680
							(-1.27)
INC	0.077***	0.077***	0.080***	0.080***	0.167*	0.265*	
	(2.98)	(2.98)	(3.14)	(3.14)	(1.85)	(1.69)	
GOOD	-0.269***	-0.269***	-0.272***	-0.272***	-0.715***	-1.256***	
	(-3.41)	(-3.41)	(-3.44)	(-3.44)	(-2.59)	(-2.59)	

	Probit models:Debt-equity decision				**Two-limit Tobit models**		
	1. Model from test route 1 (see table 6)		**2. Model from test route 2 (see table 6)**		**Gearing**		**Success rate**
	1		***2***		***3***	***4***	***5***
	IC	***AC***	***IC***	***AC***	***GEAR1***	***GEAR2***	***SUCCR***
KEEP							-1.009
							(-1.576)
PRIMARY							-2.090**
							(-2.278)
Std. deviation					3.111***	4.975***	1.406***
					(11.47)	(8.47)	(4.98)
No of obs.	1833		1833		1727	1725	96
R^2	0.03		0.03				
LR test1	See upper part of Table 6		See lower part of Table 6		$\chi^2(14)$ = 5.486	$\chi^2(14)$ = 5.88	$\chi^2(11)$ = 3.6208
LR test2	$\chi^2(10)$ = 102.94***		$\chi^2(9)$ = 101.96***		$\chi^2(6)$ = 29.31***	$\chi^2(6)$ = 28.80***	$\chi^2(8)$ = 16.87**

Notes to table 7:

1. Figures in parentheses are t statistics
2. LR test1 is a likelihood ratio test for the null hypothesis that the zero restrictions imposed in comparison with the general model are acceptable,
3. LR test2 is a likelihood ratio test for the null hypothesis that all (remaining) slope coefficients are zero.
4. The degrees of freedom (k) and critical values of the $\chi^2(k)$ statistic are as follows:

Equation	LR test1/2	Degrees of freedom	Critical values for χ^2		
			10%	5%	1%
1	2	10	15.99	18.31	23.21
2	2	9	14.68	16.92	21.67
3,4	1	14	21.06	23.68	29.14
3,4	2	6	10.64	12.59	16.81
5	1	11	17.28	19.68	24.73
5	2	8	13.36	15.51	20.09

5. * Significant at 10% level
   ** Significant at 5% level
   *** Significant at 1% level