



PROJECT MUSE®

Access to Finance and Small Enterprise Growth: Evidence from East Java

Michael A. McPherson, Jeffrey J. Rous

The Journal of Developing Areas, Volume 43, Number 2, Spring 2010,
pp. 159-172 (Article)

Published by Tennessee State University College of Business

DOI: <https://doi.org/10.1353/jda.0.0066>



THE JOURNAL OF DEVELOPING AREAS	
Volume 43	Number 2
ISSN 0022-1331	
PUBLISHED BY THE TENNESSEE STATE UNIVERSITY COLLEGE OF BUSINESS	
MEMBERSHIP: \$35.00 (US) / \$45.00 (CANADA & MEXICO) / \$55.00 (OTHER COUNTRIES)	
ADVERTISING: \$1,000.00 (US) / \$1,200.00 (CANADA & MEXICO) / \$1,500.00 (OTHER COUNTRIES)	
Circulation: 1,000 (US) / 1,200 (CANADA & MEXICO) / 1,500 (OTHER COUNTRIES)	
Subscription: \$35.00 (US) / \$45.00 (CANADA & MEXICO) / \$55.00 (OTHER COUNTRIES)	
Single Issue: \$15.00 (US) / \$18.00 (CANADA & MEXICO) / \$22.00 (OTHER COUNTRIES)	
Back Issues: \$15.00 (US) / \$18.00 (CANADA & MEXICO) / \$22.00 (OTHER COUNTRIES)	
Library: \$15.00 (US) / \$18.00 (CANADA & MEXICO) / \$22.00 (OTHER COUNTRIES)	
Individual: \$15.00 (US) / \$18.00 (CANADA & MEXICO) / \$22.00 (OTHER COUNTRIES)	
Student: \$10.00 (US) / \$12.00 (CANADA & MEXICO) / \$15.00 (OTHER COUNTRIES)	
Young Professional: \$15.00 (US) / \$18.00 (CANADA & MEXICO) / \$22.00 (OTHER COUNTRIES)	
Corporate: \$15.00 (US) / \$18.00 (CANADA & MEXICO) / \$22.00 (OTHER COUNTRIES)	
Government: \$15.00 (US) / \$18.00 (CANADA & MEXICO) / \$22.00 (OTHER COUNTRIES)	
Non-Profit: \$15.00 (US) / \$18.00 (CANADA & MEXICO) / \$22.00 (OTHER COUNTRIES)	
For more information, contact: The Journal of Developing Areas, Tennessee State University College of Business, 1000 University Blvd., Nashville, TN 37203-3400, USA. Tel: +1 615 974 2222. Fax: +1 615 974 2223. Email: jda@tnsu.edu	

➔ For additional information about this article

<https://muse.jhu.edu/article/270288>

ACCESS TO FINANCE AND SMALL ENTERPRISE GROWTH: EVIDENCE FROM EAST JAVA

*Michael A. McPherson**

*Jeffrey J. Rous**

University of North Texas, USA

ABSTRACT

The widespread acknowledgement of the centrality of micro and small businesses in the development process has led to a proliferation of projects and programs designed to assist and promote these businesses. This research examines the common assumption that access to credit from formal financial institutions is an important determinant of growth at the firm level. Our data are from a recent survey of 858 small businesses in East Java. We employ a full information maximum likelihood approach known as discrete factor method. The results indicate that access to credit is not a significant determinant of small firm growth; instead, other observable and unobservable characteristics of firms appear to cause growth.

JEL Classifications: O1, O2

Keywords: Micro and Small Enterprises, Credit, Growth

Corresponding Author's Email Address: jrous@unt.edu

INTRODUCTION

The centrality of micro and small enterprises (MSEs) in the process of economic development is by now widely recognized and essentially beyond debate. While countries are heterogeneous in the regard, it is not uncommon for such businesses to employ one quarter of the working age population in developing countries. Estimates of the contribution of the sector to GDP are probably less reliable, but typically fall in the 10% to 15% range.¹ In addition, the MSE sector may serve as an entrepreneurial training ground in which tomorrow's business leaders can find success and gain valuable experience.² As the role of the MSE sector has become clearer, policy makers in developing countries, as well as donors and others organizations, have expended increasing amounts of scarce development resources on MSE support and promotion. A tremendous and increasing amount of attention has been paid in recent years to the legal and regulatory framework that may constrain MSE expansion. Similar attention has been given to programs promoting the training of entrepreneurs and workers that may enable MSEs to grow. Still, although many programs and policies have been implemented in these areas, perhaps even more attention has been paid to the area of micro and small firm finance. The success of the Grameen Bank in Bangladesh and its clones all over the world, as well as the awarding of the 2006 Nobel Peace Prize to Grameen Bank founder

Muhammad Yunus have made micro and small firm finance one of the principal development topics of the day. According to a recent special report in the *Economist*, microfinance institutions worldwide may number in the hundreds of thousands. (*The Economist*, 2005).

Indonesia is certainly no exception to these trends. The Government of Indonesia, in conjunction with donors and nongovernmental organizations, has been more diligent than most developing country governments in promoting such programs, and by most accounts a higher proportion of MSEs in that country has received loans from formal financial institutions than is the case in many places.³ Recent estimates claim that the government of Indonesia regulates some 60,000 microfinance institutions (*The Economist*, 2005). In recent years it has been taken as a given that poor access to formal credit sources constrains MSE growth. However, for the most part, empirical evidence supporting such an assumption has been weak. Nevertheless, millions of dollars have been spent on programs that seek to mitigate this perceived obstacle. Typical examples include programs that involve subsidized credit for certain MSEs, programs that encourage banks to lend to MSEs by providing repayment guarantees, and programs such as the Grameen Bank that channel loans specifically to MSEs.

This paper seeks to address empirically the assumption that firms with access to formal credit sources are more likely to grow as a result. Certainly, such an assumption is intuitively appealing, and there is at least some empirical support for it. However, perhaps instead MSEs tend to grow because of factors not related to credit, such as entrepreneurial skill or the presence of human capital, opportunities in the subsector in which the firm operates, etc. Citing evidence from Indonesia, Berry et al. (2001, p. 378) report “firms that did and did not receive assistance show similar patterns of development, suggesting that other factors explain firm growth.” As Morduch (1999, p. 1598) asks in his review of the microfinance literature, “[w]ould the borrowers have done just as well without the programs?”

EARLIER LITERATURE

Most empirical work on the determinants of firm growth is based on Jovanovic's (1982) “learning model” and its extension by Pakes and Ericson (1998). These allow managers to influence their efficiency level via human capital formation. These theories predict that firm growth will be inversely related to initial firm size and to firm age, and directly related to the level of human capital embodied in the firm's entrepreneur. Examples of empirical research that generally support the Jovanovic (1982) and Pakes and Ericson (1998) models include Bilsen, et al. (1998), Liedholm, et al. (1994), McPherson (1995), McPherson (1996), and Parker (1994). With respect to the effects of credit on a firm's growth performance, much of the available evidence comes in the form of descriptive statistics from national surveys of MSEs. Typically, these studies compare the average growth rate of firms that had received credit with that of firms without access to credit. The obvious disadvantage of this simplistic approach is that it does not control for other factors. Daniels and Ngwira (1993), Parker and Torres (1994), Minot (1996), USAID (1998), and Ebony Consulting International (2000) are examples of this approach, and each finds that access to credit leads to better firm growth prospects for firms in various developing countries.

When efforts are made to control for other factors by use of regression analysis, results are more ambiguous. Brown et al. (2003) and Hansen et al. (2004) find evidence that MSEs with access to credit grow more rapidly. However, Daniels and Mead (1998) and Johnson et al. (2000) find that credit is not a significant determinant of growth, and Cabal (1995) reports that access to credit may actually retard the growth of MSEs in the Dominican Republic. Few of these earlier studies examines the possibility that access to credit may be endogenous, although Parker and Torres (1994, p. 23) recognize the problem indirectly. Brown et al. (2003) recognize it as a potential problem with their results, while Morduch (1999) points out that failure to address the endogeneity of credit may explain the contradictory findings in earlier research. Wynne and Lyne (2003) and Banerjee and Duflo (2004) are representative of the rare attempts in the literature to address endogeneity. Wynne and Lyne (2003) use a two stage approach, but because the credit variable is not a regressor in their growth regression, their conclusion that poor access to credit constrains growth can only be taken as evidence of an indirect linkage. Banerjee and Duflo (2004) attempt to address endogeneity directly. Their panel of data comes from a natural experiment setting. Their analysis employs a difference-in-difference-in-difference approach, and they conclude that access to credit does lead to better firm-level performance. Our paper adds to this small literature involving the examination of the influence of credit on growth while accounting for unobservable characteristics of entrepreneurs and their firms. Such factors (for example, entrepreneurial talent and zeal, or various characteristics of the community in which a given firm may be located that affect its growth prospects) are likely to be important, and the failure of earlier research to control for these casts some doubt on the validity of their findings. As part of the analysis, we will also test for the endogeneity of credit and growth. The purpose of this paper is to examine the effect of access to credit on MSE growth in a statistically rigorous manner. We make use of the discrete factor method, a full information maximum likelihood technique that allows us to control for unobservable characteristics of firms and their entrepreneurs that may affect firm growth. This method is ideally suited for this task, and to our knowledge this paper represents its first application in the area of small enterprise growth. We take advantage of a data set involving more than 800 small businesses in Indonesia collected as part of a survey in East Java in 2003.

DATA AND ESTIMATION

Sampling Methods

The data were collected over a two-month period in 2003 as part of a survey of 1,266 small businesses in East Java.⁴ In general, collecting representative data on micro and small firms in developing countries is complicated by the fact that there exists no comprehensive list of such businesses from which to draw a random sample. Because no sampling frame exists, the survey employed a stratified cluster sampling approach. In particular, lists of rural and peri-urban areas (*kabupaten*) and urban areas (*kotas*) with high concentrations of small business activity were constructed in consultation with experts employed in the local offices of the national statistical office (*Badan Pusat Statistik*). From these lists some 26 areas in *kotas* and 23 in *kabupatens* were randomly

selected.⁵ In each selected area, or cluster, an enumerator visited every business or dwelling, and those meeting the definition of small business (five to 19 employees including any working owners⁶) were enumerated. Because in some cases data on certain key questions could not be gathered, usable information for the econometric work that is described in the following sections could only be collected in 858 cases.⁷

Estimation Equations

Given the previous theoretical and empirical work, we propose a two-equation system. In equation (1), firm growth is described as a function of firm age, firm size, human capital embodied in the manager/owner and in the firm's workers, whether the firm has ever received a loan from a formal financial institution (and if so how long ago) and various other characteristics of the firm. This latter category includes the sector in which the firm operates (e.g., food and beverage production, retail, et al.), whether the firm regularly sells products on government contracts, and whether the firm operates in an urban area. That is,

$$GROWTH = F(CREDIT, AGE, SIZE, HUMANK, OTHER) + \varepsilon_i^g, \quad (1)$$

In equation (2), whether or not the firm has received a loan is represented as a function of the same exogenous variables in (1) as well as a variable that is correlated with the probability of being awarded a loan, but uncorrelated with growth. In the present case, the instrument to be employed is TITLE. This is a dummy variable taking on the value of one if the owner has formal title to land or a building. In Indonesia, such title serves as collateral, and is very important in qualifying for a loan. Specifically,

$$CREDIT = F(AGE, SIZE, HUMANK, OTHER, TITLE) + \varepsilon_i^c \quad (2)$$

There are several assumptions one can make regarding the error terms in these equations, leading to different estimation methods. These assumptions and methods are discussed in the subsequent section. It should be noted that there exists the possibility of sample selection bias in these data. That is, we do not observe businesses that have not survived, and it is possible that this introduces bias into our estimates. Still, using a broadly similar data set from sub-Saharan Africa, McPherson (1996) finds no evidence of sample selection bias in the growth equation. In addition our data do not permit us to consider 'establishment bias.' That is, imperfections in financial markets may determine which entrepreneurs are able to establish businesses. Finally, our definition of small business (5 to 19 employees at the time of the survey) necessarily excludes businesses that were in the small business category at some point in the past and shrank to less than 5 workers, as well as businesses that were small at some point in the past but grew to sizes larger than 19 by the time of the survey.

Description of the Data

Descriptive statistics on these cases can be found in Table 1. GROWTH, which is the endogenous variable in which we are principally interested, is defined as the average annual percentage growth rate in the number of employees⁸ between 1998 and the time of the survey in 2003.⁹ Although it would be ideal to measure firm-level growth in terms of

assets or revenues, growth of employment is most often used since reliable data are more commonly available and reliable.¹⁰ For the firms in the sample, this variable averages 5.7%, but varies over a considerable range. In particular, one firm in the sample shrank by an average of 18.4%, whereas another firm averaged over 200% growth per year. Indeed, the average is to a large extent being driven by a relatively small number of rapidly growing businesses. 184 (or 21.4%) of the firms in the sample shrank, and another 322 (37.5%) stayed the same size. Among the 352 firms that did grow, the average annual growth rate was 17.5%.

TABLE 1. DESCRIPTIVE STATISTICS

Variable	Mean	Standard Deviation	Minimum	Maximum
GROWTH	5.66	19.77	-18.36	210.53
Sectoral Dummies				
FOOD	0.14	0.34	0.00	1.00
TEXTILE	0.07	0.26	0.00	1.00
WOOD	0.12	0.32	0.00	1.00
METAL	0.06	0.24	0.00	1.00
OTHMFG	0.12	0.32	0.00	1.00
COMMERCIAL (Base Category)	0.39	0.49	0.00	1.00
SERVICE	0.10	0.30	0.00	1.00
Business Characteristics				
INITSIZE	5.36	5.33	1.00	151.00
FIRMAGE	18.35	11.09	4.75	77.25
Human Capital: Workers				
WKTRAIN	0.22	0.41	0.00	1.00
PRIMEDWK (Base category)	0.26	0.44	0.00	1.00
JRSECWK	0.36	0.48	0.00	1.00
SRSECWK	0.39	0.49	0.00	1.00
Human Capital: Owners				
FEMOWN	0.39	0.49	0.00	1.00
MALEOWN (Base category)	0.61	0.49	0.00	1.00
EXPERIENCE	19.29	8.83	1.00	50.00
Other Business Characteristics				
GOVTSALE	0.05	0.22	0.00	1.00
URBAN	0.20	0.40	0.00	1.00
TITLE	0.81	0.39	0.00	1.00
Credit Variables				
CREDIT	0.47	0.50	0.00	1.00
TIMESINCE	2.67	5.01	0.25	28.25
Sample Size	858			

The second variable that may be endogenous in the system presented above is CREDIT, a dummy variable that takes on a value of one if the business had received one or more loans from a formal financial institution, and zero otherwise. As Table 1 indicates, 47% of businesses in the sample reported having received at least one such loan. It may also be important to control for the amount of time that has elapsed since the business last received a loan, since loans received many years in the past may not affect more recent growth. TIMESINCE is defined as the number of years since the business last received credit from a formal financial institution, conditional on having received such a loan.

In addition to TIMESINCE, the exogenous variables in the system can be grouped into several categories. First, the sector in which a business operates is modeled by means of a series of dummy variables. For example, 39% of businesses are retailers, another 14% are engaged in food and beverage production and processing, and 12% produce or process wood or forest based products.¹¹ As discussed above, growth and probability of receiving a loan may also be affected by the size of a business and its age. For the present sample, the average initial size of firms (in terms of numbers of employees) is 5.4 and at the time of the survey the average firm had existed for 18.4 years.

Another group of variables attempts to control for human capital embodied in workers and in owners at the time of the survey.¹² WKTRAIN is a dummy variable that takes on a value of one if at least some of the workers have formal training. A series of dummy variables models the educational level of workers in the firm: JRSECED equals one if most workers have an education through the junior secondary level; SRSECED equals one if most workers have completed at least senior secondary schooling (the omitted category is firms in which most workers have primary or lower education). Regarding owners, 10.1% of businesses in the sample are owned exclusively by women: FEMOWN is a dummy variable that accounts for this. EXPERIENCE measures the number of years of experience the owner has had in the present business or in similar work.¹³

Several other variables may also explain firm-level growth. A small proportion of businesses regularly have government contracts. Such firms might be expected to grow more rapidly, either because of the steady revenue streams from such contracts, or because of other benefits a close relationship with the government might imply. Some 20% of businesses are located in urban areas. These businesses may be more likely to receive credit given that banks and other financial institutions are concentrated in urban areas.

Finally, as noted above, in order to identify the system, TITLE is included in the credit equation. This variable measures whether or not the owner of the business also holds formal title (*certifikat*) to land or buildings that could be used as loan collateral. This variable should be correlated with CREDIT, but not with GROWTH.¹⁴ In the present sample, 81% of businesses report ownership of such collateralable properties.

THE DISCRETE FACTOR METHOD

In estimating equation (1) above, one could simply employ ordinary least squares (OLS), treating CREDIT as an exogenous variable. This would imply that the error term in

equation (1) is normally distributed and that the covariance between that error term and the credit variable is zero. However, if in fact CREDIT is endogenous, OLS estimates will be biased and inconsistent. One possible solution to this problem would be to employ a two stage least squares (2SLS) approach. However, 2SLS assumes that the correlation between error terms in the equations of the system is distributed multivariate normal. If in fact the error terms are not distributed in this manner, 2SLS estimates will be inefficient.

To jointly estimate the two equations specified above and to remove the unobserved heterogeneity biases, we employ a discrete factor method similar to that described in Heckman and Singer (1984), Akin and Rous (1997), and Mroz (1999). The technique is full information maximum likelihood, but rather than making a multivariate, parametric assumption about the error term correlation (e.g., multivariate normal), we estimate a joint, discrete, multivariate distribution that approximates the true distribution of the unobservables responsible for error term correlation. To account for site and firm specific unobservables correlated with the error terms, we estimate separate firm and site level distributions.

To facilitate this estimation technique, we expand the error terms and assume the following mixed error structures respectively for the equations for firm growth and loan acceptance (credit):

$$\varepsilon_i^g = \omega_j^g + \omega_k^g + \nu_i^g \quad (3)$$

$$\varepsilon_i^c = \omega_j^c + \omega_k^c + \nu_i^c \quad (4)$$

where

g indicates elements of the error term in the growth equation,

c indicates elements of the error term in the credit equation,

ε_i is each equation's disturbance term,

ω_j are the factors that make up the part of the distribution of unobserved firm level variables that influence each equation. These are random variables that follow a discrete multivariate joint distribution.

ω_k are the factors that make up the part of the distribution of unobserved site level variables that influence each equation. These also are random variables that follow a discrete multivariate joint distribution.

ν_i is the portion of each disturbance term that is independent across cross sections.

The site and firm level distributions are made up of the ω and corresponding probability weights, all of which are estimated with the rest of the parameters in the model. The site-level factors, ω_k , in each equation are allowed to be correlated across equations. Similarly, each equation's firm level factors, ω_j , are also correlated across equations. ν^g is assumed to be distributed normally and ν^c is assumed to be distributed logistically, as in the standard logit specification.

The error term correlation allowed with the discrete factor method controls for any unobserved heterogeneity problems caused by endogeneity, and the cluster based

sample design used for collecting the data. The likelihood function is available from the authors upon request. The parameters in the model are identified technically by the nonlinear functional form of the model. However, the model gains further identification from the inclusion of the variable TITLE in the credit equation which, for theoretical reasons, does not appear in the growth equation.

RESULTS

A Hausman specification test indicates that CREDIT is in fact exogenous, and as a result we estimate equation (1) by OLS. The results are found in Table 2. While several notable results emerge, we are especially interested in the finding that while the estimated coefficient on CREDIT is positive, it is not statistically significant. In other words, when we apply standard estimation techniques to these data we do not find compelling evidence that access to formal credit significantly contributes to firm growth. However, the OLS method does not allow for unobserved site specific and firm specific effects. In this regard, the discrete factor method is more efficient than OLS. The results from the discrete factor method are presented in the third column of Table 2.

First, the significance of the discrete factor parameters suggests credit and growth are endogenous. This is somewhat surprising given the results of the Hausman test and may suggest the less restrictive distributional assumptions regarding the error structure made in the discrete factor method may be more appropriate for this analysis.

TABLE 2
REGRESSION RESULTS

Explanatory Variable	OLS	Discrete Factor Model
CONSTANT	13.762*** (4.817)	8.199*** (6.450)
Sectoral Dummies		
FOOD	-0.803 (-0.537)	0.143 (0.093)
TEXTILE	1.522 (0.378)	-4.294** (-2.225)
WOOD	-6.031*** (-2.891)	-4.108*** (-3.150)
METAL	-6.030*** (-4.389)	-2.697*** (-2.942)
OTHMFG	-1.783 (-1.289)	-0.759 (-0.484)
SERVICE	-1.177 (-0.835)	-1.259 (-1.469)
Business Characteristics		
INITSIZE	-0.511*** (-4.007)	-0.391*** (-2.599)
FIRMAGE	-0.178*** (-3.016)	-0.097** (-2.023)

Explanatory Variable	OLS	Discrete Factor Model
Human Capital: Workers		
WKTRAIN	2.421 (1.526)	2.289*** (2.904)
JRSECWK	2.507* (1.765)	1.809 (1.366)
SRSECWK	2.546*** (2.669)	2.397** (2.071)
Human Capital: Owners		
FEMOWN	-1.782 (-0.994)	0.264 (0.240)
EXPERIENCE	-0.123 (-1.526)	-0.082** (-2.275)
Other Business Characteristics		
GOVTSALE	-0.329 (-0.265)	-0.377 (-0.142)
URBAN	-0.918 (-0.516)	0.484 (0.532)
Credit Variables		
CREDIT	1.486 (0.580)	-0.630 (-0.354)
TIMESINCE	-0.273 (-0.544)	-0.216 (-0.825)
TIMESINCE ²	0.076 (0.363)	0.109 (0.867)
Site level Unobservables		
OMEGA _{k1} [†]		
OMEGA _{k2}	0.327 (1.539)	3.438*** (3.169)
OMEGA _{k3}	-0.058 (-0.118)	-2.835** (-2.095)
Firm level Unobservables		
OMEGA ₁ [†]		
OMEGA ₂	1.263 (1.145)	116.718*** (10.991)
OMEGA ₃	31.951	0.646 (0.433)
Sample Size	858	858

t-statistics are in parentheses; *.Significant at the 90% level; **.Significant at the 95% level
 ***.Significant at the 99% level; †:Normalised to zero

Table 2 contains information on the site and firm level parameters mentioned in equations (3) and (4) above. Considering first the site level unobservables, there seems to be three sorts of sites in which firms in this sample exist.¹⁵ Considering the estimated site level parameters presented in Table 2 (OMEGA_{k1} , OMEGA_{k2} , and OMEGA_{k3}), we observe that firms in the second and third sorts of sites grow more rapidly than firms located in the first sort of site. This implies that there is one or more unobserved characteristic of these sites that make growth more likely. While by definition we cannot know what characteristic or characteristics might be involved, it may be useful to speculate. For example, perhaps certain communities have enjoyed stronger economic growth than others, which has not affected credit access but has allowed more rapid firm level growth.

There are in addition three types of firms when we group by unobserved firm level characteristics.¹⁶ The relatively small number of firms of the second type grows dramatically faster than firms of the first type. What might explain these results? After we control for observable characteristics of firms, workers, and owners, there is evidently some characteristic particular to firms that makes some more likely to grow than others. For example, it might be reasonable to suppose that entrepreneurial talent or zeal has a strong effect on growth prospects. Similarly, there is a substantial (and somewhat controversial) literature on the relationship between cultural background and entrepreneurial talent. If there are certain ethnic groups whose cultural backgrounds make them especially adept entrepreneurs, this might also be an unobservable characteristic that is leading some firms to grow independent of access to credit.

Regarding the observable characteristics of firms, as a general rule the results from the OLS and the discrete factor models differ mainly in terms of the magnitudes of the coefficients. Sector is an important determinant of growth. In particular, businesses engaged in textiles, wood, and metalworking sectors grew significantly more slowly than retailers. As expected from theory and earlier literature, both firm size and firm age are inversely related to firm growth.

Table 2 also reveals that human capital embodied in a firm's workers appears to have significant effects on that firm's growth prospects. Firms in which the typical worker has had formal training have average annual growth rates that are about 2.3 percentage points higher than other firms. Similarly, having a better-educated workforce increases a firm's growth rate. With respect to owner characteristics, firms with female owners do not have significantly different growth prospects from firms with some male owners. Interestingly, an additional year of owner experience lowers the average annual growth rate by 0.08 percentage points. While this is a rather small marginal effect (a business run by an owner with 30 years' experience would have a growth rate about 1.6 percentage points lower per annum than an otherwise identical business run by a proprietor with only 10 years of experience), the sign is unexpected.

Finally, the discrete factor model also provides no evidence that access to credit has an appreciable effect on a firm's growth rate. That is, once we control for unobservable characteristics of firms as well as other observable factors, credit does not make growth any more likely. Evidently, growth is determined by the sector in which a firm operates, its initial size, its age, and certain unobservable characteristics of the firm and the community in which it operates. This suggests that factors such as entrepreneurial zeal may be important for firm growth, but that access to credit is not.

IMPLICATIONS AND CONCLUSIONS

Given the importance of the micro and small enterprise sectors to GDP and to national employment in most developing countries, it is important to consider what sorts of policies might be undertaken to foster expansion of this sector. One aspect of this is growth of existing MSEs. Our research suggests several lessons that may be of use to researchers and policy makers. First, from a statistical point of view it is important to account for unobserved heterogeneity of firms and the sites in which firms exist. Our results show that this sort of heterogeneity is statistically important in the case of East Java, and it seems likely that other data of this nature from other countries would as well. Simple regression seeking to explain firm growth may yield misleading results.

In addition, our results suggest that policy makers' enthusiasm for small firm credit could be misguided. While our data have some limitations, we see no evidence that firms with access to credit grow more rapidly than those without such access.¹⁷ Instead, firms in this sample seem more likely to grow as a result of the sector in which they operate, their initial size and age, human capital that has accumulated in firms' workers, and unobservable characteristics of firms and the communities in which they are located. The point is that firms that grow may do so for other reasons than access to formal credit. If our results are correct, they suggest that donors and policy makers might better serve the goal of expansion of existing small enterprises by reallocating resources towards worker training programs, and towards improvements in the national education system.

Additional research on this question is certainly called for. For example, we do not know whether these results generalize to settings outside of East Java. In addition, the extent to which access to informal credit sources is a substitute for formal sources would add to the discussion. Future research may also establish whether access to formal credit sources helps the growth prospects of firms in size categories outside the five to 19 worker category considered here.

ENDNOTES

* The authors gratefully acknowledge the helpful comments of R. Todd Jewell and Janice Hauge

1. See, for example, Daniels and Mead (1998).
2. For a summary of this literature, see Liedholm and Mead (1999).
3. See, for example, Timberg (2003).
4. The survey was funded by the Japan Bank for International Cooperation (JBIC), and was carried out by Development Alternatives, Inc. and the Regional Economic Development Institute. The fieldwork began in late August and concluded in late September of 2003.
5. Enumerators visited *kotas* in the cities of Surabaya, Malang, Madiun, and Kediri and *kabupatens* in Malang, Jember, Madiun, Lamongan, and Kediri.
6. There is no standard definition of small enterprise in the literature, although the World Bank's definition is relatively commonly used. A small enterprise by that standard is a firm with as many as 50 workers, total assets as large as \$3 million, and total sales up to \$3 million. The definition used in this paper coincides with that of the Government of Indonesia.

7. Our data are not part of a panel. Growth is calculated by means of retrospective questions on the survey instrument. This precludes the use of a difference-in-difference approach such as that used by Banerjee and Duflo (2004).
8. The number of employees includes working proprietors, paid workers, unpaid workers, and apprentices/trainees. Nearly 93% of all employees in the businesses in this sample are in the first two categories – only about 7% of the workforces of these firms comprise unpaid workers.
9. This particular time period is used because it represents the period after the Asian financial crisis of 1997.
10. In particular, most businesses in our sample do not keep books. Recall bias is likely to be a significant problem when using revenues, profits, or assets as firm-level performance measures. Growth in terms of number of employees is much less likely to suffer from this weakness.
11. In order to examine the possibility that a lack of access to credit may have a larger effect on certain industries (e.g., capital-intensive ones) than on others, we interact the credit dummy with the sectoral dummies. We find no evidence of any such effect, and so we exclude these regressors for reasons of parsimony. These results are available on request from the authors.
12. All human capital variables are measured as of the date of the survey. That is, our data preclude an examination of changes in human capital levels over time.
13. While the survey did gather information on the education level and amount of training of the owner or owners of each business, the large number of missing values precluded the use of owner education dummies in the models. Therefore, we proxy human capital embodied in the owner by the years or experience he or she may have.
14. The simple correlation (Pearson's) coefficient between TITLE and CREDIT is 0.185 (significant at the 99% level), while the comparable correlation coefficient between TITLE and GROWTH is -0.025 (not statistically significant).
15. Approximately 80.4% of the sample exists in the first sort of site, 11.5% in the second sort, and 8.1% in the third. It is not possible to know which particular firms fall into which sort of site.
16. Approximately 80.2% of the sample is of the first type, 1.7% is of the second type, and 18.1% is of the third type. As with the site-level factors, it is not possible to know which particular firms fall into which type.
17. Access to credit may allow micro-firms to come into existence, even if the credit does not lead individual firms to add employees. In this manner, access to credit might lead to aggregate employment growth in the MSE sector.

REFERENCES

- Akin, J.S. and J.J. Rous. 1997. Effect of Provider Characteristics on Choice of Contraceptive Provider: A Two-Equation Full Information Maximum Likelihood Estimation. *Demography* 34, pp. 513-523.
- Banerjee, Abhijit V. and Esther Duflo (2004). Do Firms Want to Borrow More? Testing Constraints Using a Directed Lending Program. Draft Paper, Department of Economics, Massachusetts Institute of Technology.
- Berry, Albert, Edgard Rodriguez, and Henry Sandee (2001). Small and Medium Enterprise Dynamics in Indonesia, *Bulletin of Indonesian Economic Studies* 37 (3): 363-384.

- Bilsen, Valentijn and Jozef Konings (1998). Job Creation, Job Destruction, and Growth of Newly Established, Privatized, and State-Owned Enterprises in Transition Economies: Survey Evidence from Bulgaria, Hungary, and Romania, *Journal of Comparative Economics* 26: 429-455.
- Brown, J. David, Earle, John S. and Lup, Dana, "What Makes Small Firms Grow? Finance, Human Capital, Technical Assistance, and the Business Environment in Romania" (May 2003). Upjohn Institute Staff Working Paper No. 03-94.
- Cabal, Miguel F. (1995). Entry, Exit and Growth of Micro and Small Enterprises in the Dominican Republic 1992-1993, Ph.D. dissertation, Michigan State University.
- Daniels, Lisa and Donald C. Mead, 1998. The Contribution of Small Enterprises to Household and National Income in Kenya, *Economic Development and Cultural Change* 47 (1): 45-71.
- Daniels, Lisa and Austin Ngwira (1993). Results of a Nationwide Survey on Micro, Small, and Medium Enterprises in Malawi, GEMINI Technical Report No. 53, Development Alternatives Inc., Bethesda.
- Ebony Consulting International and Malawi National Statistical Office (2000). Malawi National GEMINI MSE Baseline Survey 2000, prepared for the Department for International Development, Zomba.
- The Economist, 2005. The Hidden Wealth of the Poor: A Survey of Microfinance November 15 2005: p. 6
- Hansen, Henrik, John Rand, and Finn Tarp (2004). SME Growth and Survival in Vietnam: Did Direct Government Support Matter? Discussion Paper 04-13, University of Copenhagen Institute of Economics, Copenhagen.
- Heckman, J.J. and B. Singer. 1984. A Method for Minimizing the Impact of Distributional Assumptions in Econometric Models for Duration Data. *Econometrica* 52, pp. 271-320.
- Johnson, Simon, John McMillan, and Christopher Woodruff (2000). Entrepreneurs and the Ordering of Institutional Reform, *Economics of Transition* 8 (1): 1-36.
- Jovanovic, Boyan. 1982. Selection and the Evolution of Industry. *Econometrica* 50 (3), pp. 649-70.
- Liedholm, Carl, Michael McPherson, and Enyinna Chuta (1994). Small Enterprise Employment Growth in Rural Africa, *American Journal of Agricultural Economics* 76 (5): 1177-82.
- Liedholm, Carl and Donald C. Mead (1999). *Small Enterprises and Economic Development: The Dynamics of Micro and Small Enterprises*. London: Routledge.
- McPherson, Michael A. 1995. The Hazards of Small Firms in Southern Africa. *Journal of Development Studies* 32 (1), pp. 31-54.
- McPherson, Michael A. 1996. Growth of Micro and Small Enterprises in Southern Africa. *Journal of Development Economics* 48, pp. 253-277.
- Minot, Nicholas (1996). Small and Medium Enterprises in the Lao P.D.R.: The Results of a National Survey, prepared for the German Agency for Technical Cooperation (GTZ), Vientiane.
- Morduch, Jonathan (1999). The Microfinance Promise, *Journal of Economic Literature* 37 (December), pp. 1569-1614.

- Mroz, T.A. 1999. Discrete Factor Approximations in Simultaneous Equations Models: Estimating the Impact of a Dummy Endogenous Variable on a Continuous Outcome. *Journal of Econometrics* 92, pp. 233-274.
- Pakes, Ariel and Richard Ericson. 1998. Empirical Implications of Alternative Models of Firm Dynamics. *Journal of Economic Theory* 79 (1), pp. 1-45.
- Parker, Joan C. (1994). Patterns of Business Growth: Micro and Small Enterprises in Kenya, Ph.D. dissertation, Michigan State University.
- Parker, Joan C. and Tanya R. Torres (1994). Micro and Small Enterprises in Kenya: Results of the 1993 National Baseline Survey, GEMINI Technical Report No. 75, Development Alternatives Inc., Bethesda.
- Timberg, Thomas A. (2003). What I Learned in Indonesia: Nine Salient Points on the Indonesian Financial System and Small and Micro Credit, Technical Report prepared for USAID's Partnership for Economic Growth Project, Robert R. Nathan Associates, Inc.
- U.S. Agency for International Development (1998). Zimbabwe: A third nationwide survey of micro and small enterprise. Final report, Harare.
- Wynne, Adrian T, and Michael C. Lyne (2003). An Empirical Analysis of Factors Affecting the Growth of Small-Scale Poultry Enterprises in KwaZulu-Natal, *Development Southern Africa* 20 (5): 563-578.