# African Journal of Economic and Management Studies
Source of finance and small enterprise's productivity growth in Ghana
Eric Osei-Assibey,

## Article information:

## Users who downloaded this article also downloaded:

## For Authors

If you would like to write for this, or any other Emerald publication, then please use our Emerald for Authors service information about how to choose which publication to write for and submission guidelines are available for all. Please visit www.emeraldinsight.com/authors for more information.

## About Emerald www.emeraldinsight.com

# Source of finance and small enterprise's productivity growth in Ghana

Eric Osei-Assibey

*Department of Economics, University of Ghana, Legon, Ghana*

## Abstract

**Purpose** – The purpose of this study is to investigate the effects of nature and a range of institutional sources of start-up finance on micro and small enterprises' (MSEs) productivity growth in Ghana.

**Design/methodology/approach** – Using a unique non-farm household enterprise survey data from Ghana, this paper estimated TFP or Solow residual as a proxy for MSEs' productivity growth as well as other for robustness checks.

**Findings** – After controlling for firm-level characteristics such as size, age, ownership type, etc. the study finds that debt finance was positively associated with productivity growth, while financing from donation or charity did not. Second, this paper found significant positive associations between a more formal financing source such as formal and semi-formal financing sources and MSE's productivity growth. This finding was robustly confirmed by manager's growth perception. Further, compared to internal finance, external financing sources were found to be positively associated with productivity growth – indicating complementarities among all external financing sources.

**Research limitations/implications** – Further research will be needed to validate these results, particularly using enterprise ongoing finance or working capital rather than start-up capital.

**Originality/value** – The study contributes to the finance literature by studying the impact of nature and institutional financing sources on MSEs' productivity growth in the African context.

**Keywords** Small enterprises, Source of finance, Productivity growth, Ghana

**Paper type** Research paper

## Introduction

One often-cited reason for Africa's slow pace of growth and underdevelopment is low productivity growth (Wolf, 2007; Bloom *et al.*, 2010). Although several underlying factors have been identified for this in the region, financial constraints particularly among micro and small enterprises (MSEs) have received much more attention in recent times. This is because evidence abounds that lack of finance stifles innovations, investments in physical capital and new technology that are likely to stimulate productivity growth (Wolf, 2007; The World Bank, 2008). Moreover, the significant role MSEs play in reducing poverty through income and employment of the vast majority of labour force in Africa is widely acknowledged. For example, the results of the 2000 Population and Housing Census of Ghana show that about 80 per cent of the economically active population works in the informal sector.

In this regard, though policy responses have been mixed, governments, international community and NGOs are increasingly rolling out credit support programs or providing interest subsidised credits to ease the credit constraints of the MSEs. This, in part, has resulted in many microfinance institutions (MFIs) and government credit guarantee schemes providing important sources of MSEs' financing – albeit on short-term or

sometimes inadequate – in many countries like Ghana. Whilst this direct intervention is going on, many governments are also fostering a policy of all-inclusive formal financial system. This is where mainstream formal banking institutions are being encouraged to broaden access to these under-served MSEs. Although formal banks are believed to have a wider scale, offer large size and longer term loans, they have long restricted access to MSEs because of perception of risks and high transaction costs of delivery (Beck and Demirguc-Kunt, 2006).

Despite these interventions from MFIs and mainstream commercial banks, however, the majority of MSEs, particularly at start-ups, are still severely constrained. Thus, they are forced to often rely on limited household savings (self-raised financing), remittances or even donation from charitable organisations as well as sometimes on informal finance, which are known to charge exorbitantly high interest rates (Osei-Assibey, 2010). The implication of all these is that MSEs in Africa obtain finance from a variety of different sources (Green *et al.*, 2002). These sources thus reflect both microentrepreneur's preferences and the options that are available to them. Yet, the relative advantages and the output growth potentials of these respective sources are still unclear, particularly in the context of the African rural financial system.

The question thereby remains as to which of these financing sources are important and more associated with productivity growth of the enterprise. In other words, what are the incentives properties of financing sources in spurring enterprise output growth besides the contributions of labour and capital? In the recent Africa Investment Forum 2010, held in Accra, one of the key policy fall-outs was that improving access to finance is not sufficient for building successful enterprise. Much more significant is capital that drives the levers of firm-level productivity growth.

Given that the nature as well as the institutional source of these finances differs markedly, their precise relative importance in stimulating growth via productivity effect is also likely to be different. For example, while some of the financing sources come with technical and managerial advice necessary for productivity growth, Beck *et al.* (2009) have argued that financing source that provides interest subsidies will not only result in negative incentives for repayment, but also a potential disincentive for adopting-market based innovations for growth. Furthermore, according to Giugale *et al.* (2000), exogenous "Help" packages such as grants, subsidised interest rates, tax incentives targeted to informal firms promote MSE (i.e. increase their numbers) but do not "develop" them or foster their growth. To them, this breeds complacency and generates a short-term span of abnormal profits that only perpetuate and encourage smallness, as they increase the relative attraction of informality. The present study seeks to explain that when a microentrepreneur has access to credit/loan, particularly from the formal mainstream banking sector, it can then invest in newest equipments and benefit from recent vintages of capital inputs which embody more advanced technology and have a higher productive efficiency. Moreover, access to external finance that comes along with technical and managerial advice can also be an important source of productivity growth with given capital and labour inputs.

In light of the foregoing, and since the varying sources of finance have different incentive properties, we point out that understanding what kind or nature of financing source needed to spur productivity growth of MSEs, holds promise to building and promoting the necessary rural financial system likely to drive the overall growth of African economies. However, to our best knowledge, no study has empirically explored

these issues particularly in the African context. Therefore, this study aims at filling the gap by investigating how the nature and varying institutional sources of MSEs' financing influence the productivity growth.

Specifically, our study contributes to the existing literature in many respects. First, we highlight three distinct natures of financing source peculiar to MSEs, namely self-finance, debt finance and grant/donation finance. Second, we made a distinction among a range of institutional financing sources beyond which is typically the case in the capital finance literature. These are self-finance, informal finance, semi-formal finance and formal finance as well as an alternative categorisation into internal vs external finance, while assessing their respective impacts and complementarities in driving productivity and growth. Third, the unique and detailed survey data-set on nonfarm household enterprises from Ghana allows us to focus on microenterprises which have long been overlooked in the literature. Fourth, as many of such previous studies potentially suffer from endogeniety problems, we overcome these problems by using past or start-up financing sources on the present MSE's productivity indicators. Finally, we uniquely measure productivity edge or technical efficiency from a cross-sectional unexplained residual with labour and capital inputs as well as estimating other measures of factor intensities and growth perception as robustness checks.

The rest of the paper proceeds as follows. Second section explores the theoretical and empirical literature of the relationship between sources of finance and productivity growth. Third section describes an empirical framework of analysis, estimation procedure and data source. Fourth section reports the estimation results. Finally, fifth section summarises the study findings and policy implications.

## The literature
### Why should a greater formality or nature of financing matter in African context?
The financial markets in Africa are characterised by a number of market imperfections often resulting in incentives problems such as adverse selection and moral hazards. These problems are even more acute within the rural financial market which is characterised by risk, high transaction cost and uncertainty (Kimuyu and Omiti, 2000). The result, particularly in SSA countries like Ghana, has been underdeveloped financial markets which have given way to market segmentations and fragmentations (Nissanke and Aryeetey, 2006). For example, the information problem in Ghana has meant that the formal commercial banking industry, despite its rapid growth and keen competition in recent times, has restricted access to the MSEs. These constraints in accessing formal finance coupled with the widespread poverty in the sub-region mean that financing patterns of MSEs differ widely from the rest of the developing world. Evidence abounds that microentrepreneurs tend to rely heavily on their past savings, followed by informal sources of credit from family and friends, money lenders, SUSU operators and trade credits as well as donations particularly at start-up (Aryeetey, 1994). A significant number also obtained subsidised interest loan from some semi-formal financial institutions such as financial NGOs, Credit Unions, Saving and Credit companies, and government sponsored schemes.

However, as mentioned previously, the incentives properties of each of these financing for spurring MSEs' productivity growth still remain unresolved. For example, despite their limited usage, formal finance, which is commonly known to have the ability to give large and long-term loan, may be more associated with MSEs' productivity. This is because while access to formal finance may allow firms access to better and more

productive technologies, provision of long-term finance by formal finance may avert a squeeze on working capital, and that could have favourable consequences on productivity (Jaramillo and Schiantarelli, 2002).

Moreover, Du and Girma (2009) observe that the formal finance does not only convey information *ex ante* regarding the value of potential investment projects to individual savers, but also it monitors and motivates firm's managers and ensures that effective corporate governance mechanisms are in place. This managerial and technical advice may improve the skill and human capital abilities of the enterprise leading to changes in organisational structures and core functions, management systems as well as work arrangements to take the best advantage of new technologies and changing market opportunities.

In regard to the informal financing source, however, Jaramillo and Schiantarelli (2002) argue that despite the fact that they have been found to charge astronomically high interest rates that can be inimical to the growth potentials of MSEs, if their short-term loans entails more continuous monitoring, it may force firms to reduce inefficiencies and to increase productivity at each level of measurable inputs (capital stock, number of workers, materials). However, since short-term loans do not also allow investment in new vintages of capital that embodies modern technologies; informal financing source may have a chilling effect on productivity growth. Furthermore, those without access to external finance or use their own limited internally generated fund are more likely to employ outmoded second hand inputs.

### Nature of financing

Another important dimension of the financing pattern of MSEs in Ghana and Africa in general is the nature of financing. By nature of financing, we refer to the structure of financing whether it is a self-raised financing, a loan finance with commercial interest rates or a "free loan" finance such as interest-free, subsidised or even financing from grants or donation where beneficiaries are not under any obligation to repay or pay a competitive interest rate. The grant or subsidized type of external financing is particularly important for starting up small household enterprises among the relatively poor in Africa. The sources usually range from the semi-formal financial institutions such as FNGOs or governments agencies, religious organisations to close relatives.

For instance, as an integral part of social norms in most family settings in Ghana, wealthier kin or family members are supposed to help the underprivileged ones, usually with some small amount of start-up capital (referred to in the Akan language as *dwetiri*) for them to begin a small business to make a living. While in most cases these amounts of money borrowed from kin are not expected to be paid back nor documented, Aryeetey (2004) observes that they, nevertheless, a fact which partly explain why a considerable part of the borrowings done within the rural financial market in Africa for setting up small businesses are from family, friends, etc. But, however handy or beneficial these types of financing may be, the existing literature argues that a firm that generates too much free cash may find its insiders making poor investments and relaxing cost control efforts. In this case, free cash or grant could actually weaken the growth process compared with a situation where the enterprise sector has to rely more on external finance provided by an efficient and competitive financial system (Jensen, 1988; also cited in The World Bank, 2008). Such financing can make MSEs complacent and sluggish or wasteful which do not encourage productivity growth.

## Analytical framework and model specification

### MSE productivity and source of financing framework

Building on the existing literature, we show in the framework below that enterprise productivity is mainly driven by four factors, namely investment in new technology, technical and managerial skills, innovation and competition (Figure 1). The framework also shows that these drivers are essentially enabled by three underlying proximate factors, namely business and regulatory environment, education and skill training of the workforce and managers, and perhaps most importantly, access to finance (HM, 2008). As we seek to make the argument that it is not just any finance that is important in enabling the right kind of drivers of productivity, but an appropriate source of finance that support investment in newest vintages of physical capital and human capital development, we extend this framework further to include the nature and institutional sources of finance available to microentrepreneurs within the rural financial market in Ghana. We first categorise these sources into a simple debt-equity dichotomy or external vs internal finance.

While external finance comprises all finance sourced outside the domain of the enterprise, internal finance is made up of all funds raised internally including retained profit and household savings. External finance is further categorised according to its nature, i.e. whether financing is a Debt (or loan, which requires repayment with market interest) or a Grant (i.e. donation where no repayment is required – a kind of free money – or where interest rate is heavily subsidised). Furthermore, we disaggregate Debt into its institutional sources, namely, formal finance; semi-formal finance, and informal finance. Formal finance includes all mainstream commercial and universal banks as well as rural banks. The semi-formal finance sources, on the other hand, comprise financial NGOs, credit unions, savings and loans companies and government agencies. The informal finance sources include moneylenders, SUSU/ROSCAs, and friends or relatives, etc.

### The study hypotheses

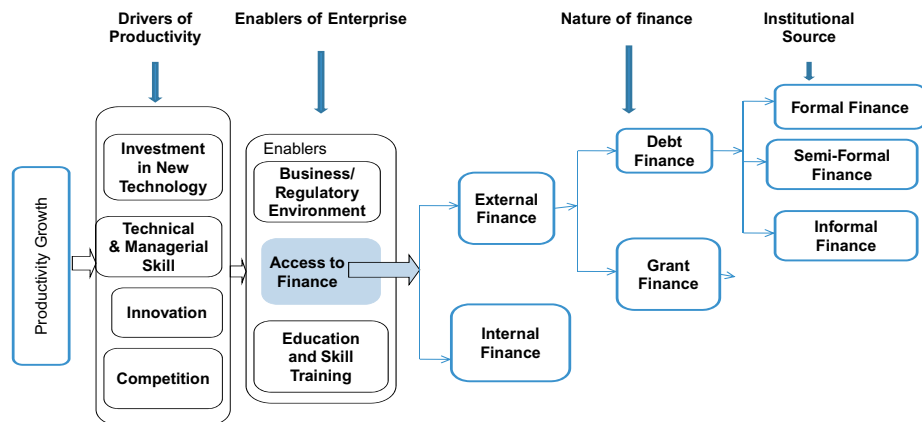Following the literature and the conceptual framework, three main hypotheses are specified as follows:



Figure 1.
Microenterprise productivity growth and source of financing framework

**Source:** Author's

$H_1$. External source of finance of any kind is more associated with MSE's productivity growth than internal or equity finance.

$H_2$. Debt finance is more associated with MSE's productivity growth than both Grant and internal finance.

$H_3$. A greater formality of institutional source of finance is more associated with MSE's productivity growth than a more informal source.

*Model specification*
In an attempt to investigate the impact of source and nature of financing on MSEs' productivity and growth, we specify the following generic productivity growth equation:

$$\text{Productivity growth}\,(Y_{ij}) = \delta_0 + \mathbf{f_{ij}}\theta_i + \mathbf{x_i}\beta_i + \mathbf{z_i}\alpha_i + \boldsymbol{\varepsilon} \tag{1}$$

where Productivity growth is primarily proxied by what we referred to as productivity edge as well as other proxies such as capital deepening, labour productivity and growth perception (a detailed discussion of measurement procedure follows this section).

Our main explanatory variable of interest, $\mathbf{f_{ji}}$ represents a vector of the various financing sources and nature. The subscript j represents individual cases, while the subscript, i, $(i = 1, 2, 3)$ represents different vectors of different structures of finance considered in this study (as shown below. Each is considered in a separated regression (refer to Figure 1):

- a vector of financing sources (where j = formal, semi-formal, informal and self-finance);
- a vector of the nature of financing (where j = Debt, Grant and self-raised finance) as well as; and
- a simple binary dummy of external vs internal finance.

However, while our baseline equation (1) generally hypothesised a positive relation between a more formal finance, and debt finance (or a negative relation between self-finance or Grant finance) and enterprise productivity growth, there is a concern that this may be due to a reverse causality. Nevertheless, as observed by Maksimovic *et al.* (2008), to the extent that we are primarily interested in establishing a broad association between the sources or nature of financing and MSEs' productivity, the direction of causality is of no consequence. Besides, we attempt to overcome endogeniety problem by simply using past or start-up capital financing sources, where the dependent variable, productivity, is the firm current productivity growth. We believe that past factors that are likely to gauge these initial sources of capital are unlikely to correlate with current observed and unobserved characteristics of the enterprise current productivity shocks. Even though this approach may appear over-simplification of the solution to the problem of endogeniety, the approach, nonetheless, reduces the degree to which the problem could occur.

*Control variables*
The variable $\mathbf{x_i}$ in the model is a vector of firm level control variables that have been studied in recent literature (Du and Girma, 2009; Maksimovic *et al.*, 2008; Gatti and Love, 2006) such as firm size, age, ownership type, industry dummies, etc.

To the extent that firm age and large size are good for productivity growth, we expect positive relations between both ageing and increasing size of firms and productivity growth. However, these relationships may be nonlinear and/or non-monotonic. For instance, as enterprise increase in size, benefit relating to scale is only to a point. Beyond that, however, laxity in supervision and lack of effective coordination can make production inefficient and hence retards productivity. In this case we also included in the regression squared terms for both age and size of the enterprise.

The variable $z_i$ is a vector included to control for employees educational status or proportion of skilled labours employed by the firm. It also includes a location dummy to control for unobserved heterogeneity at urban/rural level. (Table II for detailed descriptions of these variables). We expect enterprise that employs high proportion of skilled and trained labour to be more productive. This is because skilled workers are able to adapt to new technology/management style easier and quicker than their unskilled counterparts. We also expect firms located in the urban areas to be associated with higher productivity growth because of competition and larger market exposures. In the section that follows, we introduce how MSE's productivity growth is measured and other measurement of firm growths for robustness checks.

*Measuring MSE's productivity*

The famous Solow residual, Solow (1956), within a growth accounting framework, also known as technical efficiency/progress or TFP growth, is defined as the difference between output growth and the share-weighted growth rates of primary inputs (capital and labour) – thus, productivity growth is due to exogenous and entirely unexplained technical progress (Siroh, 2001). In other words, although firm productivity is an unobservable firm characteristic, estimates of productivity can be recovered as the difference between actual output and output estimated by a production function using actual input quantities (Gatti and Love, 2006). Therefore, the estimated residual of a production function, which is actually the technical efficiency or a measure of TFP of a firm, is given as:

$$\text{Technical Efficiency (or Residual)} = \hat{\varepsilon}_i = \ln Y_i - \ln \hat{Y}_i \qquad (2)$$

where lnY is a production function given as:

$$\ln Y_i = \delta + \beta_1 \ln K_i + \beta_2 \ln L_i + \varepsilon \qquad (3)$$

The time subscripts are removed for ease of exposition. The dependent variable, $lnY_i$, is a natural log of MSE's total output or receipts per 12 months period. The $lnK_i$ variable represents the natural log of real capital stock or tangible assets, which is proxied by the book value of such physical assets as machines, simple tools and equipment, land, vehicles, etc. The variable, $lnL_i$, measures the total number of people engaged by the by the enterprise. It has been argued that with an increase in part-time employment, hours worked provide a more accurate measure of labour input. Accordingly, the average total hours worked per year by employees were used as a proxy for labour variable. Several recent studies such as Du and Girma (2009), Gatti and Love (2006) and Levinsohn and Petrin (2003) had adopted this method in measuring firm's productivity growth or TFP over time. This study takes a similar view in measuring enterprise productivity growth.

However, the limitation with the present study is that it uses a cross-sectional dataset instead of a growth accounting or time series which accurately measures technical progress or changes over time. Nonetheless, the argument we advance here is that even at one-point in time or within a fixed time frame, in a relative term, we are likely to observe cross-sectional variations in enterprise productivity. For example, in a cross-sectional context, for the same level of capital stock and labour inputs, some enterprises may be producing more compared to others or show differences in output levels. On the other hand, we may observe that at different levels of capital stock and labour inputs, some enterprises' output levels may coincide or are comparatively the same. This seemingly unexplained variation in outputs is a typical case of one enterprise having a productivity edge over the other. This productivity edge is therefore a shock that is likely to be captured by the unexplained residual or the stochastic error term even at one point in time. In that regard, we will refer to the unexplained residual generated from the difference between actual output and output estimated by a production function as specified in equation (2) (the stochastic error term) as a cross-sectional productivity edge instead of productivity growth.

*Other proxies of productivity (as robustness check)*
Additionally, due to possible factor inputs measurement errors which can either overstate or understate the importance or the size of Solow residual, and the fact that for the majority of MSEs the composition and the value of their resources (or fixed asset base) tend to be low (and in some cases non-existent), we also used a qualitative binary response data on owners/managers' own perception of enterprise growth as compared to the previous year. The managers were asked to indicate how they would compare their gross receipts of their enterprise over the past 12 months to the preceding year. Using a simple logistic regression, the dependent variable, *Growth*, in the baseline model (equation 8.1) takes the value one, if the enterprise reported of higher growth and 0, if it experienced a decrease or stagnation. All things being equal, we expect a high productive enterprise to have a higher growth in output, thus showing similar responses with our financing variables of interest in the baseline equation.

The following shows the three main equations (equation (4)-(6)) that are to be estimated with the various measures of productivity of MSEs:

$$
\begin{aligned}
Y_{ij} = {}& \delta_0 + \theta_i \text{Nature of Finance} + \beta_1 \text{Age} + \beta_2 \text{Age square} \\
& + \beta_3 \text{Sector of Activities} + \beta_4 \text{Size} + \beta_5 \text{Size Square} \\
& + \alpha_1 \text{Skilled Labour} + \alpha_2 \text{Location}_i + \varepsilon
\end{aligned}
\tag{4}
$$

$$
\begin{aligned}
Y_{ij} = {}& \delta_0 + \theta_i \text{Institutional Source of Finance} + \beta_1 \text{Age} + \beta_2 \text{Age square} \\
& + \beta_3 \text{Sector of Activities} + \beta_4 \text{Size} + \beta_5 \text{Size Square} + \alpha_1 \text{Skilled Labour} \\
& + \alpha_2 \text{Location}_i + \varepsilon
\end{aligned}
\tag{5}
$$

$$
\begin{aligned}
Y_{ij} = {}& \delta_0 + \theta_i \text{External Finance Dummy} + \beta_1 \text{Age} + \beta_2 \text{Age square} \\
& + \beta_3 \text{Sector of Activities} + \beta_4 \text{Size} + \beta_5 \text{Size Square} + \alpha_1 \text{Skilled Labour} \\
& + \alpha_2 \text{Location}_i + \varepsilon
\end{aligned}
\tag{6}
$$

where $Y_{ij}$, the dependent variable, takes different measures of productivity growth, namely productivity edge (residual) ($i = 1$), a dummy of perception of growth ($i = 2$), Labour Productivity ($i = 3$) and Capital Labour ratio ($i = 4$).

## Data source and summary statistics
### Data source
The main dataset used in this study is based on the fifth round of Ghana Living Standard Survey (GLSS 5) of 2005/2006. The GLSS 5 is a nation-wide survey which collects a comprehensive data on areas such as demographic characteristics of the population, education, health, employment and migration as well as a special module on non-farm household enterprises. The non-farm household enterprises dataset consists of a total sample of 5,057 enterprises and provides detailed information on firm-specific level characteristics such as output levels, revenue, age, and wages as well as manager or owner's and employees' characteristics. It also reports on enterprise's start-up capital and ongoing financing or working capital sources in the last 12 months. The survey also covers three ecological zones namely, Savannah, Coastal and Forest with a further stratification into urban and rural areas (Ghana Statistical Service, 2008). However, to limit this study to microenterprises, only enterprises engaging less than ten employees were included in our analysis. This means all those employing ten and more were deleted as outliers, although this reduced the sample size by just less than 1 percent to 5,023. See the Appendix for the detail description of the data used in the estimation.

### Regression results
This section discusses econometric evidence of the effect of source and nature of financing on MSE's productivity growth. With reference to equation (1)-(3), we performed a series of linear regressions with varying measures and proxies of MSE's productivity. Our main model with the dependent variable productivity edge (estimated from the unexplained residual as specified in equation (2), was linearly estimated on three separate occasions. Each regression contains either the nature of financing, institutional source of financing or a simple external financing dummy.

As previously mentioned, Table I presents the regression results of nature of financing and MSEs productivity edge. The results show that Debt finance, compared to Grant finance, is statistically significant and positively associated with the MSEs' productivity edge. However, as expected, self-raised finance, relative to Grant finance, does not appear to have a significant relationship with productivity edge. This result is robustly supported by the findings from estimation of the relationship between growth perception and debt finance. Although the relationship involving the other two factor intensities are insignificant, compared to grant finance, debt finance shows a significant and a positive relation to perception of growth. This suggests that MSEs which used debt or loans (where repayments were required with interest) as a start-up capital were more likely to report of positive growth of their business compared to those who used grants or free money.

As the incentive properties of debt and grant finances differ markedly, these findings seem to imply that debt/loan financing appears to exert pressure on MSEs owners to be more efficient or apply more innovative ways anxiously to increase enterprise productivity in order to leverage their ability to repay their loans. On the

| Variables | Main model 1 Productivity growth | | Robustness Labour productivity | | Growth perception (logistic regression)) | |
|---|---|---|---|---|---|---|
| | Estimate | SE | Estimate | SE | Estimates | SE |
| Age of MSE | 0.471** | 0.179 | −0.202 | 0.671 | 0.133 | 0.251 |
| Age square | −0.003 | 0.095 | −0.065 | 0.352 | −0.078 | 0.129 |
| *Nature finance* | | | | | | |
| Debt finance | 0.468*** | 0.080 | −0.111 | 0.299 | 0.186* | 0.110 |
| Self-raised finance | 0.013 | 0.060 | −0.386* | 0.225 | −0.052 | 0.084 |
| Secondary industry | −0.516*** | 0.049 | −0.361* | 0.184 | 0.024 | 0.243 |
| Services industry | | | | | 0.072 | 0.242 |
| Size of MSE | −0.124 | 0.136 | −0.225 | 0.505 | 0.335* | 0.072 |
| Size square | −0.220** | 0.115 | 0.071 | 0.430 | −0.166 | 0.304 |
| Skilled/educated labour | 0.095* | 0.051 | −0.417** | 0.202 | 0.264*** | 0.076 |
| Location (urban = 1) | 0.624*** | 0.047 | 0.576*** | 0.177 | −0.240*** | 0.066 |
| Constant | −0.122 | 0.153 | 1.633*** | 0.578 | −0.006 | 0.984 |
| Durbin Watson | 1.534 | | 1.97 | | | |
| Overall percentage correct | | | | | | 59.6 |
| $R^2$ | | 0.017 | | 0.08 | | 0.017 |
| Observation | 3,845 | | 4,196 | | 4,231 | |

**Notes:** Significant at: *10, **5, ***1 per cent; grant finance is set as the reference category to the other nature of financing (see the nature of finance in Figure 1)

Table I.
Productivity and nature of financing estimation results

contrary, financing that comes "free" may stifle efforts, encourage complacency and eventually have a chilling effect on enterprise productivity growth.

Looking at finance from the perspective of institutional source, the regression results, as presented in Table II, show somewhat strong associations between greater formal sources of finance and MSE's productivity growth. Compared to self-finance, both formal and semi-formal financing sources show statistically significant positive associations with productivity edge. These relationships are robust in the growth perception model. In the growth perception model, also reported in Table II, both formal and semi-formal, compared to self-raised finance appear to have significant positive impacts on MSEs' growth. However, the results show no significant difference between self-finance and informal financing source in driving MSEs productivity or growth.

Furthermore, when all these financing sources were modelled in a binary choice variable or a dummy representing whether a source was external or internal (a debt-equity dummy) in the third model, the regression results again robustly confirm the positive impact of external finance on MSEs productivity edge (Table III). Relative to internal finance, the result indicates a statistically significant and a positive relationship between external financing source and MSEs' productivity edge. Similar outcome was also found with the relationship between external finance and perception of growth in the logistic regression model. However, the relationship between financing source and labour productivity appears weak and in most cases insignificant.

Nonetheless, the foregoing results suggest that MSEs that have access to external finance, particularly from a more formal source, are more likely to have productivity edge and perhaps experience growth over time. This is because with access to external finance, they are able to invest in the newest vintage of capital that embodies new technology to make, for example, capital per worker more efficient. Moreover, as aspects

Table II.
Productivity and institutional sources of finance estimation results

| Variables | Main model 2 | | Robustness | | | |
|---|---|---|---|---|---|---|
| | Productivity edge | | Labour productivity | | Growth perception (logistic regression) | |
| | Estimate | SE | Estimate | SE | Estimate | SE |
| Age of MSE | 0.363* | 0.179 | 0.240 | 0.672 | 0.154 | 0.252 |
| Age square | −0.164* | 0.115 | 0.074 | 0.430 | −0.180 | 0.162 |
| Ownership type (sole proprietor) | −0.181 | 0.127 | −0.437 | 0.484 | −0.638*** | 0.179 |
| Secondary industry | −0.516*** | 0.049 | −0.342* | 0.185 | −0.054 | 0.069 |
| Primary industry | −0.173 | 0.180 | 0.430 | 0.672 | −0.088 | 0.242 |
| Services1 industry | 0.512*** | 0.048 | 0.406** | 0.164 | 0.080 | 0.242 |
| Size of MSE | 0.024 | 0.136 | −0.272 | 0.505 | 0.337* | 0.187 |
| Size square | −0.070 | 0.095 | −0.058 | 0.352 | −0.078 | 0.130 |
| Skilled labour | 0.100* | 0.055 | 0.420* | 0.203 | 0.273*** | 0.076 |
| Registered | 0.504*** | 0.069 | 0.132 | 0.259 | 0.135 | 0.097 |
| *Source of finance* | | | | | | |
| Formal | 0.900*** | 0.189 | 1.694* | 0.713 | 0.855*** | 0.266 |
| Semi-formal | 0.876*** | 0.269 | 0.210 | 0.946 | 1.120** | 0.374 |
| Informal | 0.032 | 0.052 | 0.055 | 0.196 | 0.224** | 0.072 |
| Urban location | 0.658*** | 0.047 | 0.567*** | 0.177 | −0.233*** | 0.066 |
| Constant | −0.204 | 0.147 | 1.336** | 0.561 | 0.238 | 0.585 |
| Durbin Watson | | 1.488 | | 1.97 | | |
| Overall percentage correct | | | | | | 60 |
| $R^2$ | | 0.128 | | 0.09 | | 0.24 |
| Observation | | 3,887 | | 4,200 | | 4,234 |

**Notes:** Significant at: *10, **5, ***1 per cent; self-finance is set as a reference or base category (see institutional source of finance in Figure 1)

of the survey results suggest some MSEs receive technical and managerial skill training, monitoring and appropriate marketing information from the financial institutions, access to external finance was more likely to spur productivity edge and growth.

The outcome of these empirical analyses (particularly in relation to the external financing dummy results shown in Table III) suggests that there are somewhat complementarities among this range of financing sources – formal, semi-formal and informal finance, which appears to support Du and Girma (2009) conclusions that the formal financing source is no better in spurring firms growth than the informal ones or vice versa. Thus, in Ghana's context, much as we have provided some evidence to show that the formal and semi-formal financing sources are relatively better associated with productivity edge, it is more evidently clear that a mixture of these institutions and the traditional informal financing sources are even more likely to have a greater growth or development outcomes – as they reinforce one another.

Turning briefly to the other controlled variables, the level of MSE's productivity edge and growth appear also to be influenced by age of the enterprise, proportion of skilled labour to total workforce, industry type, registration status and location. The results indicate that the age of an enterprise appears to have diminishing marginal effect on enterprise productivity edge. Specifically, while age appears to have a statistically significant and positive relationship with MSE productivity edge in most of the regressions, age square has a negative sign whenever it was significant. The results

| Variables | Main model 3 Productivity growth | | Robustness Labour productivity | | Growth perception | |
|---|---|---|---|---|---|---|
| | Estimate | SE | Estimate | SE | Estimate | SE |
| Age of MSE | 0.478** | 0.180 | −0.225 | 0.671 | 0.143 | 0.251 |
| Age square | −0.020 | 0.096 | −0.056 | 0.352 | −0.080 | 0.130 |
| External = 1 | 0.122** | 0.051 | 0.151 | 0.189 | 0.273*** | 0.070 |
| Ownership type | −0.272** | 0.127 | −0.456 | 0.483 | −0.628** | 0.178 |
| Primary | −0.251 | 0.183 | 0.380 | 0.672 | | |
| Secondary | −0.513*** | 0.049 | −0.365** | 0.184 | 0.058 | 0.244 |
| Services | | | | | 0.104 | 0.242 |
| Size of MSE | −0.090 | 0.137 | −0.242 | 0.504 | 0.330* | 0.186 |
| Size square | −0.234** | 0.115 | | | −0.173 | 0.162 |
| Skill/educated labour | 0.093* | 0.055 | −0.404** | 0.202 | 0.265*** | 0.076 |
| Urban/rural location | 0.615*** | 0.047 | 0.599** | 0.176 | −0.234** | 0.066 |
| Constant | −0.045 | 0.148 | 1.339** | 0.560 | −0.056 | 0.311 |
| Durbin Watson | | 1.53 | | 1.974 | | |
| Overall percentage correct | | | | | | 59.7 |
| $R^2$ | | 0.1 | | 0.09 | | 0.021 |
| Observation | | 3,847 | | 4,199 | | 4,234 |

**Notes:** Significant at: *10, **5, ***1 per cent; internal finance is set as the reference category (refer to Figure 1)

Table III.
Productivity growth and external financing source dummy regression results

further show that MSEs that employ high proportion of skilled or trained labour, relative to unskilled labour, are positively associated with high productivity edge and growth of the enterprise.

Similarly, the location of the enterprise or spatial dimension appears robust and consistent in explaining enterprise productivity urge. The positive and significant sign in most of the estimation suggests that MSEs located in urban areas are more likely to be associated with productivity growth than their counterparts in rural areas. This is not surprising as urban areas permit wider market outreach and keen competitions. Finally, the results also show that MSEs that work in the service industry are more likely to be associated with higher productivity growth than their counterparts in manufacturing. Likewise, where the ownership type is partnership or the enterprise is registered with a government agency, the enterprise appears to be associated with productivity edge and growth.

## Concluding remarks

This paper investigated the effects of nature and sources of finance on MSE's productivity growth. Specifically, the paper sought to find out whether nature of finance (i.e. if loan, grant – "free money" – or self-raised financed) mattered for MSEs' productivity edge and growth. Further, we examine which institutional sources (e.g. formal, semi-formal, informal, and self-finance) are more associated with enterprise productivity. Using a unique non-farm household enterprise survey data from Ghana, we employ various measures of MSEs productivity such as a cross-sectional comparative unexplained (stochastic error term) residual as a proxy for productivity edge, labour productivity, and microentrepreneurs own perception of growth.

After controlling for specific firm-level characteristics such as size, age, ownership type, etc. the study reports the following findings. First, we found that where the nature of enterprise's start-up capital was loan or debt finance, compared to grant finance, the enterprise is associated with a higher productivity edge. In other words, debt finance was found to be positively associated with productivity edge of the enterprise, while financing from donation or charity did not. Second, we found significant positive associations between a more formal financing source (i.e. formal and semi-formal financing sources) and MSE's productivity edge. This finding was robustly confirmed by manager's growth perception. Further, compared to internal finance, external financing sources dummy was found to be positively associated with MSEs' productivity edge – indicating a somewhat complementarities among all external financing sources in driving growth.

In conclusion, while noting that it is not giving out grants or free money to microentrepreneurs, particularly the underprivileged ones, that are being questioned – such people without doubt need help, and making grants or subsidised interest loans are necessary in some cases–, the study sought to imply that too much of such free money can be counterproductive. It has the tendency to undermine the motivation and incentive for microentrepreneurs to be innovative in bringing about higher productivity. Awareness of appropriate sources, and improving access to external finance at a reasonable cost, will not only afford microentrepreneurs to make the needed investment in innovations and newest vintages of capital which embodies technologies and productive efficiencies, but also they are more likely to receive technical and managerial advice that will eventually lead to higher productivity and growth.

## References

Aryeetey, E. (1994), "Financial integration and development in sub-Saharan Africa: a study of informal finance in Ghana", Overseas Development Institute Working Paper 78, ODI, London.

Aryeetey, E. (2004), "Household asset choice among the rural poor in Ghana", paper presented at the Authors' Workshop for the Project on "Understanding Poverty in Ghana" Organized by the ISSER, University of Ghana and Cornell University, Accra, January.

Beck, T. and Demirguc-Kunt, A. (2006), "Small and medium-size enterprises: access to finance as a growth constraint", *Journal of Banking and Finance*, Vol. 30, pp. 2931-2943.

Beck, T., Demirguc-Kunt, A. and Honahon, P. (2009), "Access to financial services: measurement, impact, and policies", *The World Bank Observer*, Vol. 24 No. 1, pp. 119-145.

Bloom, N., Mahajan, A., McKenzie, D. and Roberts, J. (2010), "Why do firms in developing countries have low productivity?", *American Economic Review*, Vol. 100 No. 2, pp. 619-623.

Du, J. and Girma, S. (2009), "Source of finance, growth and firm size – evidence from China", UNU – WIDER Research Paper No. 2009/03, January.

Gatti, R. and Love, L. (2006), "Does access to credit improve productivity? Evidence from Bulgarian firms", The World Bank Policy Research, Working Paper Series No. 3921.

Ghana Statistical Service Report (2008), *Ghana Living Standard Survey* (*GLSS 5*), Ghana Statistical Service, Accra.

Giugale, M.M., El-Diwany, S. and Everhart, S.S. (2000), "Informality, size, and regulation: theory and an application to Egypt", *Small Business Economics*, Vol. 14 No. 2, pp. 95-106.

Green, J.C., Kimuyu, P., Manos, R. and Murinde, V. (2002), "How do small firms in developing countries raise capital? Evidence from a large-scale survey of Kenyan micro and small scale enterprises", Economic Research Paper No. 02/6, Centre for International, Financial and Economics Research, Loughborough University, Loughborough.

HM Treasury (2008), "Enterprise: unlocking the UK's talent", HM Treasury, London, available at: www.hm-treasury.gov.uk

Jaramillo, F. and Schiantarelli, F. (2002), "Access to long term debt and effects on firms' performance: lessons from Ecuador", *Latin American Economic Policies Newsletter*, Network Working Paper No. R-460, July, available at: www.iadb.org/res

Jensen, M. (1988), "Agency costs of free cash flow, corporate finance, and the market for takeovers", *American Economic Review*, Vol. 76 No. 2, pp. 323-329.

Kimuyu, P. and Omiti, J. (2000), "Institutional impediments to access to credit by micro and small scale enterprises in Kenya", IPAR Discussion Paper No. 026/2000, Institute of Policy Analysis and Research, Nairobi.

Levinsohn, J. and Petrin, A. (2003), "Estimating production functions using inputs to control for unobservables", *Review of Economic Studies*, Vol. 70 No. 2, pp. 317-341.

Maksimovic, V., Demirgüç-Kunt, A. and Ayyagari, M. (2008), "Formal versus informal finance: evidence from China", The World Bank Policy Research Working Paper No. 4465, available at SSRN: http://ssrn.com/abstract=1080690

Osei-Assibey, E. (2010), "Choosing not to borrow: an evaluation of perception and socio-cultural factors underlying voluntary self-exclusion", *The IUP Journal of Financial Economics*, Vol. VIII Nos 1/2, pp. 36-66.

Solow, R.M. (1956), "A contribution to the theory of economic growth", *Quarterly Journal of Economics*, Vol. 70, pp. 156-194.

Wolf, S. (2007), "Encouraging innovation for productivity growth in Africa", African Trade Policy Centre Working Paper, No. 54, United Nations Economic Commission for Africa (UNECA), Addis Ababa, January, available at: www.uneca.org/atpc/Work%20in%20progress/54.pdf

(The) World Bank (Ed.) (2008), *Finance for All? Policies and Pitfalls in Expanding Access*, The World Bank Group, Washington, DC.

**Further reading**

Brunton, P.D. (1999), "Financing small-scale rural manufacturing enterprises", Caribbean Development Bank Working Paper Series, Barbados.

Osei-Assibey, E. (2009), "Financial exclusion: what drives supply and demand for basic financial services in Ghana?", *Saving and Development Journal*, Vol. 33 No. 3, pp. 207-238.

Osei-Assibey, E. (2011), "Microfinance in Ghana: a comparative study of performance of the formal versus informal rural financial institutions", *Forum of International Development Studies*, No. 40, pp. 210-232.

Osei-Assibey, E., Bokpin, A.G. and Twerefou, D.K. (2012), "Microenterprise financing preference: testing POH within the context of Ghana's rural financial market", *Journal of Economic Studies*, Vol. 84, p. 105.

**Corresponding author**
Eric Osei-Assibey can be contacted at: oassibey@yahoo.com

(The Appendix follows overleaf.)

**Appendix**

|  | Observation | Minimum | Maximum | Mean | SD |
|---|---|---|---|---|---|
| *Financing source* |  |  |  |  |  |
| Formal finance | 5,016 | 0.00 | 1.00 | 0.0138 | 0.1165 |
| Semi-formal finance | 5,016 | 0.00 | 1.00 | 0.0078 | 0.0878 |
| Informal finance | 5,016 | 0.00 | 1.00 | 0.2825 | 0.4503 |
| Self-finance | 5,016 | 0.00 | 1.00 | 0.6914 | 0.4619 |
| External finance | 5,016 | 0.00 | 1.00 | 0.3086 | 0.4619 |
| *Nature of finance* |  |  |  |  |  |
| Debt finance | 5,012 | 0.00 | 1.00 | 0.1478 | 0.3549 |
| Grant finance | 5,011 | 0.00 | 1.00 | 0.1808 | 0.3848 |
| Self-raised finance | 5,012 | 0.00 | 1.00 | 0.6714 | 0.4697 |

**Source:** Data from GLSS5

**Table AI.**
Descriptive statistics of the enterprise sources and nature of start-up capital

| Firm performance | Observation | Minimum | Maximum | Mean | SD |
|---|---|---|---|---|---|
| Labour hours/day | 5,021 | 0.00 | 18.00 | 8.042 | 3.406 |
| Value added | 5,020 | $-1.42 \times 10^5$ | $4.80 \times 10^5$ | 129.100 | 9,843.535 |
| Labour engaged | 5,022 | 0.00 | 9.00 | 1.512 | 1.101 |
| Total sales/receipt | 5,021 | 0.00 | 27,200.00 | 128.910 | 595.176 |
| Nat. log of output | 4,899 | $-1.83$ | 10.21 | 3.555 | 1.504 |
| Total physical assets | 5,022 | 0.00 | 83,500.00 | 340.560 | 3,295.087 |
| Productivity edge | 4,511 | $-4.8040$ | 6.8815 | 0.000 | 1.467 |
| Positive growth ( $= 1$) | 5,005 | 0.00 | 1.00 | 0.390 | 0.4878 |

**Note:** All values are measured in local currency, Ghana Cedi (where US\$1 equivalent to about GHc 1.42)
**Source:** Data from GLSS5

**Table AII.**
Descriptive statistics of the enterprise outputs and inputs data

| Firm characteristics | Observation | Minimum | Maximum | Mean | SD |
|---|---|---|---|---|---|
| Ratio of skilled to total labour | 4,856 | 0.00 | 1.00 | 0.6919 | 0.43144 |
| Size square | 4,984 | 0.00 | 4.83 | 0.3065 | 0.68419 |
| Age square | 4,567 | 0.00 | 3.84 | 0.7982 | 0.71910 |
| MSE's size (nat. log of employee) | 4,984 | 0.00 | 2.20 | 0.2716 | 0.48244 |
| Nat. log of MSE age | 4,567 | 0.00 | 1.96 | 0.7789 | 0.43767 |
| Primary activity such as agric/mining | 5,003 | 0.00 | 1.00 | 0.0174 | 0.13073 |
| Secondary or construction ind. | 5,002 | 0.00 | 1.00 | 0.3796 | 0.48535 |
| Trading or servicing ind. | 5,003 | 0.00 | 1.00 | 0.6030 | 0.48932 |
| Ownership type (sole proprietorship $= 1$) | 4,856 | 0.00 | 1.00 | 0.9685 | 0.17470 |
| Registered with any gov. $= 1$) | 5,016 | 0.00 | 1.00 | 0.1579 | 0.36468 |
| Locality (urban $= 1$) | 5,022 | 0.00 | 1.00 | 0.4630 | 0.49868 |
| Labour engaged | 5,022 | 0.00 | 9.00 | 1.5123 | 1.1010 |

**Source:** Data from GLSS5

**Table AIII.**
Descriptive statistics of the survey data used in regression

**This article has been cited by:**

1. Godfred Alufar Bokpin, Charles Ackah, Mark Edem Kunawotor. 2018. Financial Access and Firm Productivity in Sub-Saharan Africa. *Journal of African Business* **19**:2, 210-226. [Crossref]