



Financial literacy, role models, and micro-enterprise performance in the informal economy

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Abstract

This article analyses how financial literacy and role models contribute to explaining the performance of micro-enterprises in the informal economy. Grounded in human capital reasoning and social learning theory, we argue that financial literacy and personal knowledge of role models lead to improved firm performance. We test our hypotheses on a unique dataset of 739 micro-enterprises in Ecuador. We find that financial literacy is an important predictor of financial performance but not growth, and the use of role models predicts return on assets but not other performance metrics. Our results have implications for future work on micro-enterprises and the nature of the human and social capital of their founders.

Keywords

financial literacy, informal economy, micro-enterprise performance, role models

Introduction

The extension of microcredit to help support micro-enterprises is no longer a small industry, and its growth rate has been in double digits for several years (MicroRate, 2013). More than 200 million poor individuals around the world receive microfinance services, compared to 13 million in 1997, and microfinance has become a very important source of entrepreneurial finance for the poor (Chakravarty and Shahriar, 2015; Reed et al., 2014). Many of the firms that receive microfinance services operate in the informal economy, out of view of government regulators, official statistics, and lender data (Webb et al., 2009). Indeed, in some countries, the majority of economic activity

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takes place in these 'shadow' micro-enterprises (Bruton et al., 2008; Williams and Nadin, 2012; Young et al., 2011). For many developing countries, such as Ecuador, Tanzania, and India, employment in the informal economy helps to support more than 80% of the population (International Labour Organization (ILO), 2013). Furthermore, the importance of such informal micro-enterprises is illustrated by the fact that such activity is seen as the *modus operandi* of individuals seeking to exit poverty (Bruton et al., 2013).

Despite the importance of the informal economy for the entrepreneurial pursuits of individuals and for employment, research into the actual performance of informal micro-enterprises has remained relatively scant (Webb et al., 2009, 2013a). This is notable as these types of firms allow the founders opportunity to overcome situations of poverty by providing basic provisions to the family and contribution to local communities (Bruton et al., 2015; Khandker, 2005; Khavul et al., 2009). One difficulty that may explain this limited attention in the literature relates to the challenges in finding systematic, reliable financial data about these micro-enterprises, owing to their operation in the gap between what is 'legal' and perhaps illegal, albeit it being 'socially legitimate' (Ahlstrom and Bruton, 2010; Webb et al., 2009). Financial performances (and reporting) are often inconsistent (Collins et al., 2009) and lacking in formal documentation and governmental registration (Roy and Wheeler, 2006), further complicating microfinance data.

Recent developments in microfinance, however, have provided the opportunity for scholars to examine these firms as they are obliged to register with the microfinance institutions to receive funding. For example, Khavul et al. (2009) gained access to informal family businesses through a nonprofit microfinance organization. However, studies that have addressed these issues have tended to be qualitative in nature and smaller in scope, which is perhaps not surprising given the emergent nature of research (Bruton et al., 2011; Khavul et al., 2009). As a result, greater inroads into understanding micro-enterprise performance through partnerships with more formal institutions can still be achieved.

In this article, we explore issues related to the development of informal economy micro-enterprises via microfinance institutions. More specifically, we extend research on entrepreneurship in the informal economy to examine how a basic comprehension of key concepts such as financial literacy (Bruhn and Zia, 2011; Lusardi and Mitchell, 2014) and the use of entrepreneurial role models can impact firm performance. We draw upon human capital (Becker, 1994) and social learning theories (Bandura and Walters, 1977). In so doing, we examine how financial literacy, as a measure of a specific skill-set, rather than a broader measure of human capital (such as levels of formal education), as well as the proximal use of successful role models, affects micro-enterprise performance. We argue that while financial literacy addresses an individual's ability to internally assess the benefits and costs of an entrepreneurial opportunity, role models help reduce ambiguity in decision-making (Minniti, 2005) and offer opportunities for vicarious and observational learning.

As such, we explore the appropriateness of human capital measures in the informal economy and micro-enterprise context. The majority of the entrepreneurship and new venture performance literature has focused on entrepreneurs with higher levels of education (such as Master's or PhD levels), or possessing substantial previous industry and entrepreneurial experience (often referred to as expertise). One recurring result is that greater levels of human capital are important for venture performance (Unger et al., 2011). However, this same literature has tended to overlook more context-specific areas of human capital, including that among base-of-the-pyramid micro-enterprises where entrepreneur goals are focused upon escaping poverty rather than traditionally espoused entrepreneurial goals (Williams and Nadin, 2010). For instance, in a context where formal education is often limited, understanding applicable skill-sets and base level knowledge, such as financial literacy, might be more relevant than completion of higher education to the

performance of entrepreneurs. We treat the ability to assess an opportunity financially, that is, the financial literacy of the individual undertaking the evaluation, as an important part of opportunity evaluation (Wood and McKelvie, 2015). Fundamentally, if entrepreneurs in the informal economy lack understanding of rudimentary financial concepts and tools, how can they accurately evaluate the performance potential of a potential entrepreneurial opportunity? Performance, in this case, acts as a means to potentially alleviate resource deficiency and poverty (Adekunle, 2011).

Our study offers several contributions; first, we outline and empirically test a model of entrepreneurial micro-enterprise performance in the informal economy. In so doing, we address critiques of a singular view of performance (Adekunle, 2011; Murphy et al., 1996; Wood, 2006) by analyzing three forms of firm micro-enterprise performance – profits, return on assets (ROA), and sales growth. This is notable as scholars are only beginning to develop robust empirical insights into micro-enterprises that operate outside the purview of established institutions since micro-enterprise performance data are relatively rare (Bruton et al., 2008; Webb et al., 2009). To achieve this, we partner with a microfinance institution (Banco-D-MIRO) to secure reliable and valid financial performance data. These data help provide more systematic empirical insights regarding the performance of micro-firms overall in addition to factors that might improve performance.

Second, we extend theoretical discussion of human capital and the ‘ability’ of evaluating opportunities within the tangential realm of financial literacy. Consequently, we expand the literature on human capital, with regard to financial literacy, and social learning theory, in regard to role models, to reflect a particular context. From a theoretical point of view, our treatment of financial literacy as a form of human capital reflects a skills approach (Davidsson, 2004; Ucbasaran et al., 2008; Unger et al., 2011); this is relevant for micro-entrepreneurs facing poverty. We argue that financial literacy is a more germane indicator of human capital given the context of informal economy micro-enterprises in comparison with traditional measures such as formal education. In comparison with relative concepts such as self-efficacy (Chen et al., 1998), financial literacy measures actual, as opposed to self-perceived, skills and abilities. Specifically, the financial literacy measures involve physically completing a task rather than the self-perceived ability to solve a task. This is important given the limited evidence related to skills and abilities of micro-entrepreneurs in the informal economy (Drexler et al., 2014; Field et al., 2010). To that end, we are able to contribute to gaps in the financial literacy literature (Lusardi and Mitchell, 2014) concerning the extent to which it helps alleviate poverty; in addition, we extend the human capital literature to a relatively novel domain where traditional measures are not germane.

Relatedly, our examination of proximal role models as a source of social learning and social capital follows Aldrich and Zimmer’s (1986) view that ‘entrepreneurship is a social role, embedded in a social context’ (p. 20). Our theoretical and empirical contribution lies in our treatment of proximal role models – those known to the individual – as opposed to distal – generally but not personally known – role models as it offers greater specificity in the importance of such role models (Bosma et al., 2012). This not only acknowledges the importance of social communities for micro-enterprises (Khavul et al., 2009) but also extends the role model literature from the impact on entrepreneurial intentions (Krueger et al., 2000) to that of micro-enterprise performance (Bosma et al., 2012). The combined effect of these contributions is a more informed understanding of how informal economy micro-enterprises are able to alleviate conditions of poverty.

Theory and hypothesis development

The capabilities of micro-enterprises are nearly synonymous with those of the founding entrepreneur, as the vast majority of these firms are centered around one individual. To achieve a baseline level of performance, which for the most part is sufficient to help alleviate poverty, it is important

for these businesses to offer goods or services that are somewhat unique or meet unsatisfied customer demands. For many firms in the formal economy, there is a larger focus on the role of resources and formal human capital of the entrepreneur as a predictor of firm performance (Unger et al., 2011).

Human capital is often enhanced through education or experience, but in the absence of specific skills or if facing uncertainty, entrepreneurs may also learn from role models (Bandura and Walters, 1977; Minniti, 2005). In many developing countries, individuals leave education after five years as the perceived marginal benefit of further schooling does not outweigh the perceived incremental cost. Unger et al. (2011) argue that education and experience are only indirect measures of human capital, instead showing that the direct outcome of human capital investments, such as skills and knowledge, provides a better link to performance. In other words, *what you learn* is more important than *how many years of education*. Hanushek and Woessmann (2008) argue that

there is strong evidence that the cognitive skills of the population – rather than mere school attainment – are powerfully related to individual earnings, to the distribution of income, and to economic growth. (p. 607)

Analyses of the impact of human capital on micro-enterprise performance often apply measures such as the entrepreneur's formal education and previous work experience. However, research shows that the outcome of education and work experience – such as skills and knowledge – are better predictors of firm performance than education alone (Unger et al., 2011). We argue that in the context of informal micro-enterprises, the applicability of formal human capital measures may be less germane. For instance, Honig (1998) finds that education had a negative relationship with performance on Jamaican micro-entrepreneurs with no clear linkage between formal education and income levels. Furthermore, it was found that those with only primary education generated higher incomes than those with junior secondary education. This suggests a negative relationship between education and performance, possibly as a result of experience being more important in certain contexts. However, Honig (1998) also found that those with vocational training had higher earnings, suggesting again that the skills acquired in those educational situations are critical for firm performance. Moreover, Berge et al. (2014) found a positive impact on Tanzanian male entrepreneurs after undertaking business skills training. Finally, Van der Sluis et al. (2005) found that one year extra of entrepreneurship education in the developing world leads to a 5.5% increase in enterprise income.

In developing countries, the opportunity to achieve a high level of formal education may not be possible; and if it were, it might not be relevant to running a micro-enterprise. Practically speaking, many people leave school early, leading to undeveloped basic skills. There are many reasons for this, including the cost of schooling (or indirect costs such as food, uniforms, and travel), the cost of extra tutoring or the opportunity cost of not being able to provide extra income to one's family (Ardiente and Guiking, 2015). However, we argue that a rudimentary understanding of basic finance will assist entrepreneurs to make decisions via mental accounting. In other words, there may be benefits from alternate measures of human capital than formal education. In the space between the discovery phase and the exploitation phase of the entrepreneurial process (Shane and Venkataraman, 2000), an entrepreneur's inner ability to evaluate the perceived opportunity demands a certain level of financial literacy that, even in developed markets, is not universal (Lusardi and Mitchell, 2011c). Financial literacy is generally described as important to human economic decision-making (Lusardi and Mitchell, 2014). This is particularly important in an informal economy with frequently high interest rates and high inflation, oftentimes calculated as above 30% for inflation-adjusted interest rates (Mersland and Strøm, 2012).

Prior research on financial literacy is linked to intended pension planning or saving behavior. Such research shows a meaningful impact on pension and saving behavior, whereby a causal relation is said to begin with knowledge (of finance) and ends with a behavior (a decision, in this case). Assessing an opportunity requires the ability to make numerical calculations (Lusardi, 2012). Bruton et al. (2011) found that an important characteristic of borrowers in better-performing businesses is an 'awareness of interest rates and the time value of money' (p. 727), suggesting that financial literacy is vital to firm performance. However, there is no consensus around the general utility of financial literacy. For example, in India, research on micro-enterprises indicates that the cognitive ability of micro-entrepreneurs is low and that rather than considering interest rates, they focus on the amount they owe on a weekly or monthly basis (Tiwari et al., 2008). The theory of mental accounting (Thaler, 1985) suggests that individuals make decisions based on a higher expected value based on the perceived benefit (concave curve) versus the perceived loss (convex curve). This implies that an individual must be able to assess an opportunity based on how much cash it will bring in relative to the investments needed. It is suggested that those who are more financially literate do indeed perform better.

In addition, the ability of an entrepreneur to engage in planning is positively related to performance (Baum et al., 2001; Frese et al., 2007), and in this process, financial literacy is a prerequisite for successful financial planning (Lusardi, 2012). An entrepreneur must be able to weigh the expected return from making an investment in one category against the expected return from making the same investment in another category, where the risk/return characteristics should be the basis for the evaluation (Fama and MacBeth, 1973). Thus, in this study, we argue about the degree to which understanding the basic financial concepts of compound interest rates, inflation, and risk diversification affects the performance of micro-entrepreneurs in the informal economy. We therefore hypothesize the following:

Hypothesis 1. Among micro-enterprises in the informal economy, there is a positive association between an entrepreneur's financial literacy and their micro-enterprise's financial performance as measured by (a) profitability, (b) ROA, and (c) sales growth.

Entrepreneurship as a process involves relationships with others where the social context matters. Entrepreneurs are at some point 'affected by relations with socializing agents who motivated them' (Aldrich and Zimmer, 1986). Entrepreneurs are seldom autonomous decision-makers; rather they are individuals acting in a social environment influenced by the behavior and advice of others (Sarasvathy, 2009). This social environment is important in decision-making situations that involve uncertainty, including the probability of failure. In an informal economy, the consequences of failure are not subject to a judicial system. Consequently, the consequences of failure, including persistent poverty, may haunt an individual over their lifetime. Although the range of possible outcomes is known to the entrepreneurs and although they may be able to do simple numeric exercises, such as the financial literacy ones employed in this article, they may still face decision ambiguity (March and Olsen, 1976). The future road map is puzzling or more likely mysterious, with much missing information that has to be gathered and assessed through trial and error (Nye, 1994; Sarasvathy, 2009) especially if the entrepreneur also lacks formal training or has the experience to address this ambiguity. Therefore, entrepreneurs may need to look to a role model for advice, influence, and connections (Bruton et al., 2010). We argue that this is even more important in an informal economy, where human capital is less developed, financial literacy is relatively poor, many entrepreneurs are faced with ambiguity, and where negative outcomes can be particularly detrimental.

Social learning theory, in the context of entrepreneurship, proposes that learning can take place by observing the behaviors of role models (Bandura and Walters, 1977). It suggests that

entrepreneurs replicate the behavior if it is viewed as socially effective, thereby attempting to match appropriate models (Bandura et al., 1963). Similar to an institutional framework such as Cooperative Thrift and Credit Societies (CTCSs) the presence of role models creates an enabling external environment for entrepreneurship (Adekunle, 2011). Research on role models has shown that individuals tend to make decisions on the basis of social cues (Minniti, 2005). This implies, for example, that decisions to expand or create a business may be indirectly influenced by external actors. Thus, entrepreneurs learn from observing others; in this sense, role models act as a form of social capital (Newman et al., 2014). The mere presence of successful peers generally offers inspiration or support (Bandura and Walters, 1977) or legitimizes entrepreneurial pursuits (Davidsson and Wiklund, 1997). This reduces ambiguity in decision-making (Minniti, 2005) and offers guidance for future actions (Bosma et al., 2012). In sum, for micro-entrepreneurs, social learning via role models is vital as it helps to circumvent limited experience or formal training. It also allows micro-entrepreneurs to observe, discuss, and learn about opportunity and business-related issues.

The majority of research on role models in entrepreneurship has focused on their effect on the development of entrepreneurial intentions (Bosma et al., 2012; Krueger et al., 2000). The main gist of the literature is toward the effects of social learning on the desire to enter entrepreneurship. We contend that role models continue to be influential even after the entrepreneurial intention stage. Entrepreneurs use role models, or social linkages, as a source of information, to learn; lacking specific skills may cause them to turn to the role model for advice or be inspired to follow the role model's example. There may be some diversity in role models; there are distal role models with whom the entrepreneur has no direct familiarity and proximate role models with opportunity for social interaction (Bosma et al., 2012). Our focus is on the latter. In line with social learning theory (Bandura and Walters, 1977), micro-entrepreneurs are more attracted to, and will learn from, role models who are similar in nature (Putnam, 2007). This supports role model identification and so facilitates imitative or modeling behavior (Bosma et al., 2012; Gibson et al., 2004), including when facing similar situations or challenges. It is through the involvement and engagement with the role model that the micro-entrepreneur is able to learn.

Consequently, role models contribute to ongoing social learning (Bandura and Walters, 1977). While there is limited research on the impact of role models on the micro-enterprise performance, there is some evidence suggesting that social learning – even broadly defined – has an impact on entrepreneurial performance in the informal economy. So, for instance, the study by Honig (1998) found that semiweekly church attendance and marital status positively influenced firm performance; it is presumed this was not affected by divine influence but through returns on social capital. Khavul et al. (2009) also illustrated the importance of both family ties and local community ties to the establishment and growth of businesses via achieving support (Putnam, 2000).

We argue that with established linkages motivated by role models, micro-entrepreneurs can be better guided in their opportunity-seeking (Aldrich and Zimmer, 1986) as well as ongoing entrepreneurial efforts (Cooper et al., 1994). The social environment 'contributes to reducing the ambiguity associated with entrepreneurial decisions' (Minniti, 2005: 5). In the micro-enterprise context, observational learning or vicarious learning (Bandura, 2003; Bandura et al., 1963) from successful individuals has a positive impact on performance by identifying pitfalls and potential solutions to challenges (Cooper et al., 1994). Furthermore, Newman et al. (2014) propose that relational social capital positively influences existing venture growth. As such, we argue that role models are an important element of a network; they may not only lower the ambiguity in decision-making but also provide extra experience and knowledge to guide decisions to positively affect firm performance. Consequently, we hypothesize the following:

Hypothesis 2. Among micro-enterprises in the informal economy, there is a positive association between the usage of role models and the micro-enterprise's financial performance, as measured by (a) profitability, (b) ROA, and (c) sales growth.

Method

Sample

We draw upon a unique sample of micro-enterprises in Ecuador, a country with widespread informality covering more than 80% of the working population (Canelas, 2014; World Bank, 2012). Ecuador, therefore, offers a helpful and valid context to understand micro-enterprises in the informal economy. Moreover, the focus on micro-enterprises is important as these types of firms provide jobs and income to more than one-third of all households in Ecuador. By collaborating with the leading microfinance institution in Ecuador,¹ Banco D-MIRO, we were able to acquire detailed financial data collected as part of their credit analyses, including data from a national credit bureau. The credit officers spend considerable time assessing and evaluating businesses, including assets, income, and costs while undertaking multiple on-site visits, to ensure the risk of default remains low. In other words, we have a full picture of the financial position of the clients, including debt with other financial institutions, as well as the credit analyst's best assessments of the value of assets, such as machines, cars, inventories, and buildings, of the individual entrepreneurs involved. We also conducted an additional 20-minute telephone survey, reaching 750 micro-entrepreneurs in order to gather further information regarding their financial literacy and usage of role models. By combining methods – a telephone survey regarding the entrepreneur and the data acquired from Banco D-MIRO – we were able to gather rich information about both the entrepreneur and the micro-enterprises. Employing a telephone, as opposed to a written survey, also allowed us to circumvent potential concerns in regard to literacy. Furthermore, given our focus on firm financial performance, we have excluded the value of family assets, and focused only on the micro-enterprises. After limiting the number of firms to only those with fewer than 10 people helping the founder, the full sample was 739 firms. These are truly micro-enterprises, where the average number of employees working with the firm is slightly above one. The total assets are worth roughly US\$ 16,000 – with many possessing almost no assets, with an average debt of US\$ 2600 and an average annual sale of approximately US\$ 26,000. These descriptive statistics provide support that the firms in our sample are indeed micro-enterprises (Ayyagari et al., 2007). Furthermore, 60% of the micro-enterprises in the sample are women. The age of the founders ranges from 19 to 68, with an average of 42 years. On average, these micro-entrepreneurs have completed 1.6 levels of education, which implies that most have only a basic level of education (6 years). Although the mean number of years of experience in running a business among our respondents is quite high (almost 12 years), this is slightly skewed by the number (almost 5%) of entrepreneurs with greater than 30 years of experience. In contrast, approximately one-third of the sample had less than five years of experience. See Table 1 for more details.

Measures

Dependent variable. Our dependent variable is micro-enterprise performance. The literature suggests a multidimensional approach to measuring performance (Combs et al., 2005), separating performance into financial and operational measures. The rich dataset allows us to measure performance across three core dimensions, representing different aspects of micro-enterprise performance, in line with Bosma et al. (2004). Because these micro-enterprises are typically very small,

Table 1. Sample descriptive statistics.

Variable	Mean	SD
Female, %	60	51
Age, years	42	11
Completed school level (1–4)	1.7	0.7
Number of previous loans	3.1	2.5
Number of years running own business	12	9
Total assets (in US\$)	16,552	14,784
Total liabilities (in US\$)	2607	4878
Net sales (in US\$)	26,640	22,222
Net result (in US\$)	6366	6029
Return on assets (ROA), %	45	38
Sales/Assets	2.5	7.0
Profit margin, %	10	14

SD: standard deviation.

our first measure of performance is the annual profit. In this context, profit entails positive cash flow to the entrepreneur, allowing them to pay for daily and routine expenses, including food, clothes, and potentially housing. In other words, the notion of profit has a direct impact on the daily discretionary spending of the micro-entrepreneur and helps support their life-needs. Second, we measure the ROA of the firm. This performance measure relates directly to the assets employed as part of the micro-enterprise. While this performance measure may seem at odds with the micro-enterprise context, ROA illustrates efficiency. Given that the level of assets owned is generally quite low, we are able to take into account the potential variations that come with any potential investments into fixed assets (such as physical retail locations and inventory) rather than service businesses without assets. We measure ROA as net income divided by total assets. Reflecting extant research (e.g. Hvide and Møen, 2010), we winsorized the assets at the 5% level and replaced asset values below US\$ 3200 with US\$ 3200 – the 5% winsorization cut-off level in our sample. Moreover, in most of these businesses, the entrepreneur does not take a salary – any firm financial profit is extracted to pay for personal expenses of the founder. As such, the opportunity cost of labor accordingly needs to be deducted (Shane and Venkataraman, 2000). By comparing the wages of workers in the formal sector with those in the informal sector, it is estimated that the informal wage is 91% of the actual minimum wage in Ecuador during the period 2010–2012 (Canelas, 2014), or US\$ 289. This avoids overestimating the ROA of the micro-enterprise.

Third, we use a longitudinal measure of micro-enterprise performance – sales growth. Given that all credit assessments are not done every year, we use a variable where we compare the average sales in 2014 and 2015 with the average sales during the period 2009–2013. This method allows us to circumvent issues related to missing data resulting from the informal nature of the firms and their financial assessment. Growth as a measure of performance is important such that we may understand whether or not the micro-entrepreneur is willing and able to grow. Sales growth is the most common performance measure in new venture performance (McKelvie and Wiklund, 2010). We take the log transformation of the raw sales growth variables in order to ensure normalcy.

Independent variables. We use two independent variables in our study, reflecting Hypotheses 1 and 2. First, we examine financial literacy. Building upon a previously tested concept (Lusardi and

Mitchell, 2011a), we asked three questions to test understanding of financial concepts by the entrepreneurs: (a) we capture the ability to perform simple calculations (numeracy) and the understanding of the idea of compound interest; (b) we tap into understanding of the concept of inflation; and (c) we examine the concept of risk and diversification. In our test, the third question is modified from the original questions (Lusardi and Mitchell, 2011a, 2011b) to be relevant to the informal economy. In the original question, the concept of ‘stock’ or ‘mutual fund’ was used, that is, share investment. We changed this to ‘opportunity’ instead, making it synonymous with the word used when taking a loan and using the money for a hopefully value-enhancing opportunity. The survey, which included questions for the test, was conducted using a professional call center at Banco D-MIRO that was supervised by a team of three researchers and a manager during the entire process. Using telephone interviews also overcomes any potential issues with illiteracy. By first pre-testing the questions on a sample of 60 individuals, we obtained sufficient variability in the responses and were able to validate that our modified question number fulfilled the same criteria of being simple, relevant, brief, and differentiable among individuals. The questions were translated into Spanish by the research team in close collaboration with the head of the call center, which are as follows:

1. Suppose you had \$100 in a savings account and the interest rate was 2% per year. After five years, how much do you think you would have in the account if you left the money to grow? More than \$102, exactly \$102, less than \$102?
2. Imagine that the interest rate on your savings account was 1% per year and that inflation was 2% per year. After 1 year, would you be able to buy more than, exactly the same as, or less than today with the money in this account?
3. Do you think that the following statement is true or false? Investing everything in one opportunity usually provides a more certain economic reward than investing smaller amounts in many different opportunities.²

Our second independent variable is *role models*. Previous studies equate exposure to entrepreneurs to having ‘role models’ (BarNir et al., 2011; Bosma et al., 2012; Franco et al., 2010; Liñán and Chen, 2009; Van Auken et al., 2006) without considering whether or not the role models were seen to be successful or distal or proximal relationships. Reflecting social learning theory, and in particular that of role identification and modeling, we focus on the personal knowledge and use of entrepreneurial role models. As a consequence, and to circumvent issues related to distal role models, we developed four novel items that reflect both exposure to and usage of role models. On a scale from one to five, interviewees were asked to indicate their level of agreement with the following four statements:

1. I am personally familiar with successful entrepreneurs.
2. In my network of friends and colleagues, there are successful entrepreneurs.
3. I regard some of the entrepreneurs I know as role models.
4. Some entrepreneurs I know have been a source of influence for me.

We offered respondents the response scale on a scale of ‘strongly disagree’, ‘disagree’, ‘neither disagree nor agree’, ‘somewhat agree’, and ‘fully agree’, rather than the numerical statements of a five-point scale. We elected to do this as the numerical statements resulted in poor variability in our pilot study. Through this modification, we saw improved variance in the responses. The results of these four questions were averaged to obtain a single measure of role model, with a Cronbach’s alpha of 0.832.

Control variables. Because firm performance can be affected by numerous other factors, we control for both micro-enterprise-specific measures and entrepreneur-specific measures. At the micro-enterprise level, we control for *financial leverage* (debt/equity), *size* (assets), *industry*, *number of employees*, and *degree of urban location*. The informal economy is often dominated by certain industries, and for industry specifications, we created dummy variables using the standard industrial classifications relevant to the informal economy (United Nations, 2008), such as wholesale, construction, repair shops, and restaurants. For degree of urban location, we used data from national statistics in Ecuador (INEC, 2011) combined with the location of the particular micro-enterprise in our study. This gave us a degree (e.g. a percentage) of urbaneness in the specific location. At the entrepreneur level, we control for *gender*, *age*, *level of education*, and *previous loan experience*, measured as the number of previous loans taken. For level of education, we employ a categorical measure with three levels, where each is approximately six years apart (basic, upper secondary, and post upper secondary), thus assuming equidistance.

Results

Although not traditional for reporting hypothesis tests, we nevertheless thought it was important to provide a general overview of entrepreneurs in terms of their financial literacy. As seen in Table 2, only 2.6% of the individuals answered all three questions correctly. On other hand, only 5.5% answered none of the questions correctly. The interest question was answered correctly by 45.3% of the respondents, the inflation question by 37.8%, and the risk question by 29.2%. The interest rate question therefore appears to have been the easiest, followed by the inflation question and, finally, the risk question. In Table 2, we provide a comparison of the financial literacy test results to other national populations. We discuss these comparisons in greater depth in the 'Discussion' section.

Table 3 reveals a statistically significant correlation between two of the three dependent variables (Profits and ROA, $r=0.40$, $p<0.01$). This is not surprising given their measurement overlaps, although with some differences (i.e. cash in hand versus efficiency). Surprisingly, sales growth is negatively – as opposed to positively – correlated with our other performance measures. This unexpected finding nevertheless highlights the importance of using multiple measures of firm performance in studies as they can provide a fuller picture of performance. The other correlations among key variables are relatively low (i.e. under 0.30), with only a few of notable statistical significance, with the exception of size and profit. As a result, we do not view multicollinearity as a significant concern for our data. This is supported by the fact that the variance inflation factors (VIFs) are under 1.3, which is well below the recommended cut-off of 10 (Hair et al., 2010).

Attention is now directed to testing the two main hypotheses. In the regression analysis, shown in Table 4, we found significant statistically significant relationships between financial literacy and profits (Model 1: coeff. 0.084, $p<0.01$) and financial literacy and ROA (Model 2: coeff. 0.092, $p<0.01$). Our findings thus support Hypotheses 1a and 1b. However, we did not find a statistically significant relationship with sales growth as in Hypothesis 1c (Model 3: coeff. -0.088 , n.s.). Other new venture research highlights a generally positive relationship between sales and profitability, although this literature acknowledges the potential risks of growth (Delmar et al., 2013). Furthermore, that research is focused on formal economy new ventures (of various sizes). Nevertheless, our findings do not support Hypothesis 1c. For Hypothesis 2, we find that role models are significantly and positively related to ROA (Model 2: coeff. 0.090, $p<0.01$), supporting Hypothesis 2b. However, we do not find any statistically significant impact of role models on profits (Model 1: coeff. 0.047, n.s.) or sales growth (Model 3: coeff. 0.079, n.s.). Consequently, we do not find support for Hypotheses 2a and 2c.

Table 2. Measured financial literacy in the informal economy of Ecuador, compared with previous research in the United States, Italy, and Romania.

	Informal Ecuador	USA	Italy	Romania
Interest question (%)				
More than \$102 (correct)	45.3	64.9	40.0	41.3
Exactly \$102	4.5	11.3	25.0	11.5
Less than \$102	2.5	9.2	6.8	8.2
Do not know	47.3	13.5	28.2	34.4
Refused to answer	0.4	1.0	n/a	4.6
Inflation question (%)				
More	14.7	11.2	6.2	11.5
Exactly the same	8.6	9.0	3.8	11.4
Less (correct)	37.8	64.3	59.3	31.8
Do not know	38.8	14.2	30.7	40.4
Refused to answer	0.1	1.4	n/a	4.9
Risk question (%)				
False (correct)	29.2	51.8	52.2	13.5
True	48.3	13.3	14.2	14.7
Do not know	22.1	33.7	33.6	63.5
Refused to answer	0.4	1.2	n/a	8.3
Cross question consistency (%)				
Interest and inflation	41.5	46.2	31.5	20.5
All correct	2.6	30.2	24.9	3.8
None correct	5.5	12.3	26.4	40.1
At least one 'does not know'	60.9	42.4	44.9	75.5
All do not know	11.4	4.7	19.9	29.8
Year of data	2013	2009	2007	2011
Number of observations	755	1488	3992	1030

Source: The US data were as reported in Lusardi and Mitchell (2011c), Italian data were from Fornero and Monticone (2011), and Romanian data were from Beckmann (2013).

Among the controls, we find that loan experience, age (younger), gender (being a male), leverage, size (larger), number of employees, and location (rural) all have a statistically significant relationship with profits (Model 1). We also find that previous loan experience, leverage, size (smaller) and location (rural) are all statistically significant related to ROA (Model 2). Finally, loan experience and size (smaller) are related to sales growth (Model 3).

Discussion

The goal of this article was to assess the impact of financial literacy and role models on informal economy micro-enterprise performance. In achieving this, we offer novel contributions to theory, empirical evidence, methods, and practice. First, our findings contribute to the theoretical and empirical research on financial literacy (Lusardi and Mitchell, 2014), extending this to the context of informal economy micro-enterprises, many of whom live in poverty. Our results reveal a pattern of positive results for the effects of financial literacy on micro-enterprise performance, specifically ROA and profits. We found that an emphasis on basic financial literacy skills matters (Cole et al., 2009; Webb et al., 2013b). This suggests that the ability to understand basic financial concepts adds

Table 3. Descriptive statistics and bivariate correlations.

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1 ROA	0.45	0.38													
2 Profit	6366	6029	0.396**												
3 Sales growth	0.31	0.47	-0.088	-0.321**											
4 Financial literacy	1.1	1.0	0.086*	0.131**	-0.081										
5 Role models	4.0	0.8	0.102**	0.077*	-0.001	0.158**									
6 Loan experience	3.1	2.5	0.044	0.265**	0.148*	-0.008	-0.004								
7 Age	0.0	11.0	-0.150**	0.069	-0.067	-0.031	-0.008	0.214**							
8 Age ²	121.4	134.9	-0.048	-0.114**	0.006	-0.096**	-0.021	-0.040	0.119**						
9 Education level	1.7	0.6	-0.011	0.001	-0.042	0.092*	0.047	-0.074*	-0.111**	0.029					
10 Gender	0.4	0.5	0.040	0.122**	-0.069	-0.002	0.054	-0.081*	-0.005	-0.080*	0.049				
11 Leverage	0.3	1.4	0.151**	0.158**	-0.038	-0.004	-0.051	0.037	-0.009	-0.061	0.052	0.038			
12 Size (sales)	113.5	8.5	-0.317**	0.572**	-0.278**	0.063	0.011	0.214**	0.307**	-0.067	0.025	0.078*	0.034		
13 Number of employees	1.4	1.3	0.052	0.167**	-0.068	0.036	0.056	0.030	-0.002	-0.080*	0.005	0.168**	0.028	0.117**	
14 Urban location	0.9	0.2	-0.141**	-0.064	0.047	0.007	-0.074*	0.960**	0.039	-0.033	0.035	-0.051	-0.019	0.088*	0.001

SD: standard deviation; ROA: return on assets.

** Correlation is significant at the 0.01 level (two-tailed test); * Correlation is significant at the 0.05 level (two-tailed test).

Table 4. Ordinary least squares (OLS) regression relating financial literacy and role models with micro-enterprise performance.

	Model 1	Model 2	Model 3
	Profit	ROA	Sales growth
H1: Financial literacy	0.084** (2.902)	0.092** (2.650)	-0.088 -(1.280)
H2: Role models	0.047 (1.619)	0.090** (2.618)	0.079 (1.108)
Controls			
Loan experience	0.175*** (5.767)	0.133*** (3.659)	0.198** (2.753)
Age	-0.134*** -(4.319)	-0.064* -(1.726)	-0.023 -(0.318)
Age ²	-0.030 -(1.021)	-0.029 -(0.845)	-0.031 -(0.454)
Level of education	-0.028 -(0.975)	-0.014 -(0.394)	-0.056 -(0.836)
Gender (male = 1)	0.071* (2.314)	0.065* (1.784)	0.043 (0.582)
Leverage (debt/equity)	0.124*** (4.364)	0.158*** (4.654)	0.001 (0.018)
Size ln	0.560*** (17.943)	-0.329*** -(8.847)	-0.297*** -(4.117)
Number of employees	0.080** (2.729)	0.067* (1.929)	-0.005 -(0.067)
Urban location (%)	-0.112*** -(3.881)	-0.108** -(3.120)	-0.088 -(1.280)
<i>n</i>	739	739	217
<i>F</i> statistic	27.334***	8.659***	2.177**
<i>R</i> ²	0.434	0.196	0.174
Adjusted <i>R</i> ²	0.418	0.173	0.094
ΔR^2	0.010***	0.019**	0.010

Standardized beta displayed, with standard errors within parentheses. Profits are winsorized at the 5% level. Industry controls are included but not reported. ΔR^2 is over and above control variables (one-tailed test).

* Significant at the 5% level; **significant at the 1% level; ***significant at the 0.1% level.

significant value to the micro-enterprises and their owners. Furthermore, these numeracy skills and abilities, rather than formal education and previous experience, act as a more context-appropriate view of human capital given its predictive power. As such, financial literacy seems to provide a clearer path forward to escaping poverty or at least covering subsistence expenses. To that end, our findings highlight the need for more detailed treatment of a context-specific type of human capital that may be viewed at the ‘left tail’ as compared to firms in the formal economy. Generally speaking, our findings reflect those of Bruhn and Zia’s (2013) on women-owned businesses in Bosnia and Herzegovina; moreover, other aspects such as improved marketing skills appear to have a positive effect on micro-enterprise growth (Webb et al., 2013b). However, our findings contrast with those studies that capture human capital through measures such as higher education and previous entrepreneurial experience (Bosma et al., 2004; Unger et al., 2011). We view our results on micro-enterprises as important as these performance measures have a direct impact on the day-to-day lives and discretionary spending of entrepreneurs, allowing them to address daily living needs in the face of poverty. As such, they may stand in stark contrast to new venture goals portrayed elsewhere in the literature that reflect growth aspirations and profit maximization.

Our findings also offer new contributions to the role model literature. Those micro-entrepreneurs who know successful entrepreneurs as role models (i.e. as proximal role models) also make better investment decisions and achieve a higher ROA. This is a similar effect to that of financial literacy. However, for role models, we did not see any impact on profits or sales growth. The positive impact on ROA adds further evidence that the existence of role models may reduce ambiguity in decision-making (Minniti, 2005) and possibly enhance returns through higher or improved

risk-taking. More importantly, it lends further support to social learning theory, as individuals who learn by observing and interacting with other successful entrepreneurs achieve a higher ROA in their businesses. The results also point (albeit marginally) toward a relationship between role models and profits. These findings lend partial support to proposition that social capital will positively influence venture performance (Newman et al., 2014). We are, nevertheless, hesitant to draw that as a conclusion. Our results may represent a more complex view of role models than previously argued or simply that it is difficult to grow informal businesses due to other factors, such as competitiveness and economic isolation. The use of role models within entrepreneurship has tended to be in relation to intentions for new venture creation, rather than financial performance (Bosma et al., 2012). Our results, nonetheless, illustrate that increasing the opportunity for vicarious or observational learning of other successful entrepreneurs, perhaps with the support of microfinance institutions, might positively affect performance.

Furthermore, in terms of methodological contributions, we were able to work with a local partner firm to gain access to micro-enterprises. While not the first to adopt a partnership approach (Khavul et al., 2009), we were able to acquire systematic financial performance data via this approach. When combined with a telephone survey, our dataset allowed us to capture more comprehensive set of information on micro-enterprises than previously reported in the literature. Specifically, working with a microfinance firm helped to partly address calls by Godfrey (2011) and (Webb et al., 2013a) for increased research on legitimate forms of micro-enterprises transitioning to the formal economy. Our results also highlight the importance of using different performance measures; this may provide an explanation for the relatively inconsistent results within current literature (Bruhn and Zia, 2011; Cole et al., 2009; Delmar et al., 2013; Webb et al., 2013b).

Our control variables show several interesting findings, which may have implications for future research. Our measure of loan experience, number of previous loans taken with this microfinance institution, is significantly and positively related to a higher ROA, higher profits, and higher sales growth. This is important as multiple loan opportunities may signal that the entrepreneur develops his or her financial literacy capabilities (despite the non-statistically significant correlation) or at least understands the loan process. Contrary to the meta-analysis by Unger et al. (2011), we do not observe any direct causal effect of formal human capital investments, such as education level and experience, apart from a significant and negative relationship between age and profits, implying that younger micro-entrepreneurs earn higher profits. Honig (1998) found a negative relationship between level of education and success. Our findings, therefore, illustrate that financial literacy is a better predictor of micro-enterprise performance outcomes than broader measures of human capital investments, such as education, reinforcing the message that future researchers should focus more effort on measuring skills, rather than level of education. Our measure of size shows that with increased size ROA and sales growth diminish, but profits increase. This seems consistent as it is easier to achieve a higher ROA and grow sales at higher rates when the business is very small. In our study, firm size shows an association with profits, implying the existence of positive economies of scale. The urban location measure shows that firms located in more rural areas tend to have higher returns and profits than firms in urban locations. Sales growth was not influenced by location; however, this might be due to a selection preference by the local credit officer who might prefer to spend time on larger and more profitable rural businesses rather than on less profitable ones due to the time it takes to reach the rural entrepreneur.

From a practice perspective, our findings offer a number of contributions. Our findings emphasize that even small improvements in financial literacy among poor micro-entrepreneurs can have major impact on performance. Muhammad Yunus (2006) once equated those in poverty to bonsai trees, suggesting that if a bonsai tree does not grow there is nothing wrong in the seed – ‘only the soil-base that is too inadequate’. In our study, the poor soil-base is perhaps exemplified through

poor financial literacy and minimal access to formal education. More broadly, it may imply that the promise of microfinance to unleash the capacity of informal economy entrepreneurs may still be valid, if the soil-base can be improved. This is relevant to entrepreneurship scholarship in the way that good business opportunities require both enterprising individuals and a conducive context (Shane and Venkataraman, 2000), and this is equally true among adverse conditions where context-specific human capital may trump traditional measures. Nonetheless, we also acknowledge some of the potential negatives that might come from microfinance, not the least the consequences of financial illiteracy. One specific negative example is from Andhra Pradesh in India, where rural women were caught in a negative spiral, having to take on more debt to pay off previous debt. The result of the escalating financial difficulties led to a large number of suicides among the women there (*Business Insider*, 2012).

Further related to practitioner contributions, we argue that our sample of micro-entrepreneurs, all of whom were approved for credit by a microfinance institution based on their past performance (i.e. is not forward looking), illustrates that those with higher financial literacy also possess the ability to better evaluate an opportunity. To that end, they appear to make better investment decisions. This highlights the importance of developing studies of entrepreneurs with generally low financial literacy skills and poor levels of education. To note is that our results, in terms of the levels of financial literacy (see Table 2), are for the most part comparable to those of other developing countries, such as Romania (Beckmann, 2013). A more striking difference is the number of individuals who answered 'do not know' (47.3%), including 11.4% who answered that way for all questions. The number of 'do not know' answers is higher than that reported in studies conducted in different countries (Lusardi and Mitchell, 2014). However, the number of individuals answering none of the questions correctly was relatively low (5.5%). The results to the interest rate question were similar to studies in Romania and Italy, the responses to the inflation question were similar to those in Romania, and the risk question was more correctly answered compared to Romania (Beckmann, 2013; Fornero and Monticone, 2011). Combined, we conclude that the levels of financial literacy that we observed in our sample (but not the full population) of Ecuadorian micro-entrepreneurs are relatively similar to those in other developing countries in the world. Other Organisation for Economic Co-operation and Development (OECD) countries generally score much higher than the informal economy, thus also confirming the link with improved financial literacy as a measure of a human capital skill and general economic development. However, we are hesitant to extrapolate our findings to other populations of informal economy micro-firms.

Limitations and future research

As with all studies, this work is not without limitations. First, the study focuses on the informal economy of Ecuador, where it is not possible – nor is it our aspiration – to generalize the findings to the informal economy globally. Indeed, the unique nature of Ecuador offers a particular area for where we could begin to examine micro-enterprise performance; it is not our goal to generalize outside of this context. Second, the sample of selected micro-entrepreneurs is not fully at the bottom-of-the-pyramid (London and Hart, 2004). Rather, the micro-enterprises are concerned with stable cash-flow-generating businesses that are able to receive financing. Indeed, the micro-enterprises received a micro-loan from Banco D-MIRO and where average sales were approximately US\$ 26,000 per annum. We do capture micro-enterprises that default while we also acknowledge that our sample does not capture those in extreme poverty.

Third, we rely on self-reported financial information based on the specialized information provided by our partner Banco D-MIRO and the survey we conducted. Due to data limitations of informal economy firms, we acknowledge the rudimentary measures for our sales growth variable,

where we, due to the specialized nature of the data, are not able to acquire year-by-year firm data. However, we hope that this limitation is somewhat minimized by the rarity of the data involved. To that end, we recognize the caveat that we rely on one microfinance institute for data. Research has shown that microfinance institutions may have various goals, and these will impact their lending preferences and performance (Shahriar et al., 2016). Fourth, although one strength of this study is the multi-faceted nature of the performance variables, we do not capture the full set of potential performance outcomes. There may be other psychological or social goals for the micro-enterprises (Newman et al., 2014), rather than purely financial. For instance, the goal behind the firm may simply be to have some income to the household in the absence of other employment options or to address poverty. This may provide some explanation for our lack of findings for sales growth. Addressing further, non-financial goals would be an important next step for research to examine. Fifth, we also acknowledge that there may be other human capital-related factors which also may be at play here apart from financial literacy. For instance, micro-entrepreneurs may lack other fundamental skills, such as writing and reading, although they possess financial literacy. These same micro-entrepreneurs may also draw upon their previous work experience or familial relations in furthering their business. Although we focus on two important variables – financial literacy and use of role models – we acknowledge that other human capital and social learning factors may also be important in understanding micro-firm performance.

Finally, some of our non-results offer opportunities for future research. For instance, we found that financial literacy is not related to sales growth. There may be a number of explanations for this null finding. First, growing the business may not be a primary goal for these entrepreneurs (Christensen, 2006). If the goal is to achieve a satisfactory income to live on, then growth may not be a desirable outcome for informal economy micro-enterprises (Bruton et al., 2015; Jensen, 2002). Growth implies adding new work tasks and taking on new responsibilities (Wiklund et al., 2003); it may lead to formalizing the business as well as pursuing innovation (Ahlstrom, 2010), which may in turn have implications for the ‘informal economy’ status of the firm. Furthermore, growth can be difficult to manage creating unexpected problems and concerns. Second, in line with Magill and Meyer (2005), growth may lead to increased competition. Adding capacity and leveraging firms in such an environment, therefore, may potentially make the competitive landscape even tougher, where competing firms may note the success of the micro-enterprise and attempt to duplicate business models or practices. Webb et al. (2013a) found that financial literacy had a negative relationship with growth; this was attributed to the notion that those entrepreneurs who had financial literacy also had a higher awareness of the risks involved in growth. Entrepreneurs subsequently eschewed growth. Our non-finding (compared to the negative relationship found by Webb et al., 2013b) may also suggest that other factors such as the intensely competitive nature of the informal economy may constrain growth. Finally, Ecuadorian micro-enterprises sell mostly to other individuals, and not to larger companies or institutions, as in other countries; this may further constrain growth potential (Magill and Meyer, 2005). Deeper understanding of the goals and considerations of micro-entrepreneurs may begin to address some of the non-findings in our study.

Conclusion

This article offers an important foray into the influence of context-specific human capital and social learning theory on micro-enterprise performance. By examining the importance of financial literacy, as a measure of human capital skill, and the existence of successful role models, as part of social learning, we see these have a stronger impact on performance compared to more traditional metrics, such as formal education and previous experience. To this end, we are better able to examine a context-specific aspect of human capital, which we argue is more relevant than

traditional treatments of human capital. In this way, we investigate the fundamental skills involved in potentially evaluating an opportunity, albeit for a micro-enterprise. This has important implications for future theorizing about the role of human capital in micro-enterprises in the informal economy. Furthermore, it also provides a clear signal to policymakers that increasing the financial literacy of entrepreneurs can further their micro-enterprises. Our findings suggest future research may more effectively employ measures of human capital that reflect the needs and specific skills for the task at hand, rather than simply the number of years spent in formal education (Hanushek and Woessmann, 2008).

Consequently, our study bridges previous research on financial literacy in the developed world (Lusardi and Mitchell, 2014) with that of informal economies in developing countries, while suggesting that increasing the prevalence, visibility, and access to potential entrepreneurial role models can improve performance of micro-enterprises. Therefore, mentorship programs linking experienced and successful entrepreneurs with micro-entrepreneurs may be a complementary strategy in poverty alleviation programs. The informal economy is undoubtedly important for the well-being of many developing countries (Ahlstrom and Bruton, 2010; Ahlstrom and Ding, 2014; Young et al., 2011). With the World Bank and other nonprofit organizations actively promoting financial literacy to help economic development, it is vital to understand and measure its impact on the target groups, such as micro-enterprises. This can not only improve micro-enterprise performance and the sustainability of the microfinance sector but also helps to avoid the problem of individuals assuming debt in the absence of understanding how the financing should be used and how repaid. Our study provides further insight into how areas of basic training can increase the performance of the micro-enterprises in the informal economy and thereby improve the lives of entrepreneurs. The promise of microfinance to unleash the energy and creativity in poor individuals is still an important vision, but further analysis is required at the foundational level. There is little doubt that further investments in financial literacy support and the provision of role models will contribute to enriching the soil of developing societies so that further seeds of entrepreneurship and economic growth can be sown.

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Notes

1. According to a global ranking by Microfinance Information Exchange (Martínez, 2014).
2. In studies of developed countries, the question read, 'Do you think that the following statement is true or false? Buying a single company stock usually provides a safer return than a stock mutual fund' (Lusardi and Mitchell, 2014).

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