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Constrained firms, not subsistence activities: Evidence on capital returns and accumulation in Peruvian microenterprises

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HIGHLIGHTS

- We build a model of microenterprise (ME) dynamics under credit constraints and risk.
- Using panel data for Peruvian MEs we show high marginal returns to capital.
- Higher productivity and wealth, and less risk exposure foster capital accumulation.
- Risk interacts with wealth and all constraints, including risk, have sizable effects.
- This is evidence of constrained MEs rather than subsistence activities.

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ABSTRACT

We present a multi-period model of capital accumulation in order to investigate microenterprise (ME) production dynamics in a developing country context characterized by credit constraints and risk. These constraints are reflected in marginal returns to capital above market interest rates and we show that capital accumulation is faster in MEs with higher productivity, higher initial wealth and less risk exposure. We test our predictions using panel data for Peruvian MEs from 2002 to 2006. We indeed find high marginal returns to capital and sizable effects of household non-business wealth and, in contrast to previous studies, risk on capital accumulation in MEs. The findings of this paper can serve as a basis for the promotion of combined credit and risk management devices to enhance private sector development.

1. Introduction

Income from microenterprises (MEs) constitutes the main source of income of the growing number of urban dwellers in developing countries. It is widely assumed that some of these MEs may not realize their full earnings potential due to limited access to credit. This assumption provides the rationale for a key policy intervention towards MEs, micro-credit programs. Several empirical studies have found very high marginal returns to capital in MEs in poor countries — typically well above market interest rates, and in some studies highest at very low levels of capital stock (Fafchamps et al., 2011; Grimm et al., 2011; Kremer et al., 2010; McKenzie and Woodruff, 2006). This finding hints indeed at credit constraints as one major obstacle to firm growth. Otherwise, a profit-maximizing entrepreneur would increase the capital

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stock until marginal returns equalize the market interest rate. Empirical work that explicitly addresses credit constraints also confirms their importance (De Mel et al., 2008; De Mel et al., 2012; McKenzie and Woodruff, 2008; Dromel et al., 2010). De Mel et al. (2008), for instance, perform an experiment, in which they randomly provide cash or in-kind transfers to Sri Lankan MEs. The authors find, at least for male entrepreneurs, marginal returns to capital in a range from 55 to 70% per year. Consistent with credit market constraints, the marginal returns to capital are lower (higher) for wealthier (poorer) entrepreneurs. In a similar experiment in Mexico, McKenzie and Woodruff (2008) also provide evidence of very high returns of at least 20–33% a month. Returns are – with up to 100% monthly – the highest among firms with capital stocks near $200 that report being financially constrained. At least for this selected group, there is hence a strong indication for credit market imperfections causing high returns at low levels of capital.[1]

Yet, credit constraints may only partly explain the observed high returns to capital. Successful entrepreneurs should be able and willing to re-invest a part of their high returns into their ME, thereby overcoming credit constraints, accumulating capital and bringing down marginal returns (as shown, for example, by Tybout, 1983). Risk may be the reason why this is not the case, as optimal capital stocks may be much lower in risky environments. The empirical literature generally has difficulties in the operationalization of risk and risk attitudes, which may explain why so far empirical research on the role of risk for ME performance is scarce. An exception is De Mel et al. (2008) who do, however, not find any sizeable effect of risk on returns to capital and no significant differences in marginal returns between risk-averse and less risk-averse entrepreneurs. Nevertheless, there is indirect evidence of the role of risk, such as the high rates of churning among informal MEs in developing countries (Mead and Liedholm, 1998).

In this paper we consider a multi-period model of capital accumulation that helps to disentangle the role of credit and risk constraints for ME production dynamics. In particular, we first consider the marginal returns to capital in a dynamic perspective. Second, by specifying utility and production functions we study how credit constrains and risky environments separately as well as their interaction affect capital accumulation and may hamper ME production growth. Third, we examine the role of enterprise age in partly overcoming the effects of risk and credit constraints. Risk may be reduced through learning over time and credit constraints may be relaxed through savings.

Empirically, we test our model on the basis of a unique panel dataset of Peruvian MEs covering the period 2002 to 2006. The analysis of the ME sector is particularly relevant in the case of Peru, as these firms account for about 75% of urban employment in this country. Our data include mostly self-employed workers and firms with unpaid employees. Only 12% of all firms have paid employees. This is consistent with the theoretical framework where we consider a household production model. Even during the impressive growth period covered by our panel, with growth averaging 5.7% per annum, there has been no decline in employment in MEs. We first estimate production functions to test whether Peruvian MEs have high returns to invested capital. In addition, we use this step to compute total factor productivities and an idiosyncratic risk proxy. We then examine the determinants of capital accumulation by focusing on the two fundamental constraints to capital growth in MEs, credit constraints and risk. First, we confirm our model's prediction that marginal returns to capital for Peruvian MEs are higher due to credit and risk constraints. Second, both theoretically and empirically we find that the start-up capital is significantly lower and capital is accumulated more slowly due to credit constraints and risk. Finally, we show that credit constraints and risk interact and that the effect of risk and not credit constraints is less evinced in older enterprises.

This paper hence adds new insights on the returns to capital and the dynamics of small-scale production activities in developing countries. In addition to confirming high marginal returns, we enrich these findings on the particular and mixed effects of credit constraints and risky environments for ME performance. More importantly, our paper is one of rare papers presenting a dynamic theoretical analysis of capital accumulation for MEs. A unique panel data set on Peruvian MEs allows for both structurally testing our theoretical model predictions and providing primary evidence on capital accumulation. Our main contribution is hence to complement the static investigation of high returns to capital by a dynamic analysis of the determinants of capital accumulation with a focus on risk as well as to examine the effect of the interaction between credit and risk constraints.

The remainder of the paper is organized as follows. The subsequent section reviews previous findings in the literature. Section 3 presents a multi-period model of capital accumulation for MEs and derives the theoretical hypotheses. Section 4 describes the dataset and the basic characteristics of Peruvian micro-entrepreneurs and their enterprises. Section 5 presents our empirical setup and discusses the results. The final section summarizes our main findings and concludes.

2. Related literature

Our analysis adds to a growing recent literature on the performance of MEs in developing countries. Beyond the empirical studies that focus on returns to capital and their causes mentioned above, there is a separate strand of the literature that examines the patterns of entry, exit, and growth of MEs. Mead and Liedholm (1998) summarize the findings of a research project on ME behavior which draws (partly) on panel datasets from a number of developing countries. In most cases the authors find high rates of churning among MEs, with survival being positively associated with firm age, smaller initial size and past growth. The analysis of firm growth shows that MEs, which were smaller at start-up, tend to grow more rapidly than their larger counterparts. Moreover, young firms grow faster.[2] These results are similar to those obtained by Fajnzylber et al. (2006) using Mexican data. They find that size and time in business are negatively related to exit and growth. They conclude that MEs in Mexico show dynamic patterns consistent with a number of standard results from the theoretical literature on firm dynamics. Using a database of all registered firms in Cote d'Ivoire from 1977 to 1997 Klapper and Richmond (2011) confirm that the probability of survival increases with firm size, however, this effect is eliminated after 1987, the year which marks the start of the Ivorian Crisis.

While Mead and Liedholm (1998) and Fajnzylber et al. (2006) describe quite well some dynamic features of MEs in developing countries, they do not address the causes of differences in behavior.[3] Few studies explicitly show the impact of capital constraints on accumulation. One exception is a study about the garment industry in Tirupur in Southern India by Banerjee and Munshi (2004). The authors find large and systematic differences in the level of capital stock in firms owned by people from two different community groups. This finding may be attributed to differences in access to capital between the groups. One of them, the Gounders, comes from a relatively wealthy agricultural community that was the first to move into the garment industry in Tirupur. Banerjee and Munshi (2004) argue that the incumbent Gounders start their businesses with much higher levels of capital stock than comparable outsiders because of their stronger ties to the local community, and

[1] Similar evidence (for selected groups of entrepreneurs) is provided by Fafchamps et al. (2011).

[2] McPherson (1996) and Coad and Tamvada (2012), for example, show similar patterns for southern African and Indian firms, respectively.

[3] Fajnzylber et al. (2006) do present some suggestive evidence in favor of credit constraints. The authors regress employment growth on dummies for credit at start-up, and dummies for subsequent credit (and a set of other controls). Firms with start-up credit appear to grow slower given that they reach their optimal capital stocks more rapidly. In contrast, MEs with subsequent access to credit grow faster, as they can quickly adjust to their optimal capital stock. Yet, the authors acknowledge that this result might be driven by simultaneity.