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# Addressing constraints to small and growing businesses



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## **Abstract:**

Salaried wage jobs are the distinguishing feature separating the middle class from the poor in developing countries (Banerjee and Duflo 2008). Where do salaried wage jobs come from, and how can small and medium-sized firms create more of them? We review the evidence on constraints to growth of small and medium enterprises. We first examine evidence on constraints to capital and skilled labor, firms' primary inputs to production. We then consider factors that affect the efficiency with which firms are able to transform inputs into outputs, focusing on managerial talent. Finally, we look at the importance of linking firms to markets and the role of demand in generating firm growth. We conclude with a proposal for a research agenda built around important but unanswered questions.

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## Addressing Constraints to Small and Growing Businesses

Employment generation is a primary focus of policymakers in countries at every income level. Though the majority of the urban workforce in most low-income countries are self-employed, stable wage employment is a gateway to the middle class (Banerjee and Duflo 2008). What barriers must be overcome for the private sector to generate these stable wage jobs? We focus here on the role of small and growing businesses in employment generation and growth. Small businesses face challenges in any environment, but in developing countries those challenges are particularly numerous and severe. We review the evidence for what works to help small firms prosper.

Small firms in low-income countries are different in many respects to those in high-income countries. Most importantly, the majority of the smallest firms in developing countries are subsistence enterprises whose owners are neither interested in nor prepared for sustained growth (Lerner and Schoar 2010). Figure 1 shows a typology of small firms in developing countries, categorized by the propensities for growth and innovation.<sup>2</sup> The mass of subsistence enterprises exhibit both low growth and low rates of innovation. Above them on the graphic is a group of enterprises labeled as livelihood-sustaining enterprises. These are small enterprises selling traditional products and services, but ones that have grown beyond subsistence to hire additional employees. Above these are dynamic enterprises, well-established and medium-sized businesses, typically operating in established industries, and often a source of jobs for low- and moderate-skilled workers. The graphic also shows two additional categories representing a smaller number of more innovative businesses. The first of these are niche ventures – firms that are moderately innovative and have the potential for sustained growth that is nevertheless limited by a narrowly defined market. The second innovative group at the top of the graphic represents the more disruptive, high-growth, ventures that may bring new technologies to markets or business models that disrupt sectors like retail.

Each of these stylized business types has different aspirations and faces different constraints. Understanding constraints to growth depends first, then, on separating firms according to potential for growth and innovation, a task important to researchers and practitioners alike. Having done that, we can then ask: What are the constraints to growth among the small firms with aspirations and potential to grow? This is an ambitious question around which to build a review of the literature, because there are many potential factors that constrain firm growth. We frame the discussion here by organizing the review around the importance of constraints on capital, labor and technical efficiency.

The available evidence indicates that firm dynamics in lower-income countries are very different from those in higher-income countries even among larger, formal, enterprises. Hsieh and Klenow (2014) compare firm-level dynamics in India and Mexico with those in the United States. They show that surviving firms in the U.S. grow 6-8 times in size over their first 40 years, while surviving firms in Mexico only double and those in India do not even double. This suggests that young firms face tighter constraints in India and Mexico relative to the U.S. Eslava and Haltiwanger (2017) use firm census microdata from Colombia over a 30-year period to trace the trajectories of individual firms operating there. They show that, on average, employment grows by a factor of three over a 30-year period, a bit less than half the rate of growth in the U.S. They attribute essentially all of the growth gap to differences in the upper decile; that is, the median firms in the U.S. and Colombia grow at similar rates, but Colombia lacks the superstar performers that drive higher average growth rates in the U.S.

These comparative dynamics frame our discussion of constraints on the growth of small firms in lower-income countries. We will see that the literature suggests we now understand quite a lot about how to increase incomes of the smallest enterprises. Providing them with capital

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<sup>2</sup> This typology is adapted from Collaborative for Frontier Finance, 2018.

works, if it is provided in the right way. Training does not, at least when it is provided in the wrong way, though recent training innovations show more promise. The evidence on mentoring is thinner, but what is there suggests that mentoring has positive effects at least in the short term. But this work also suggests that many of the interventions increase income without dramatically changing the growth path of firms over time. Thus, the existing evidence suggests that the interventions neither spur significant employment generation within small firms nor address the gap among the superstars.

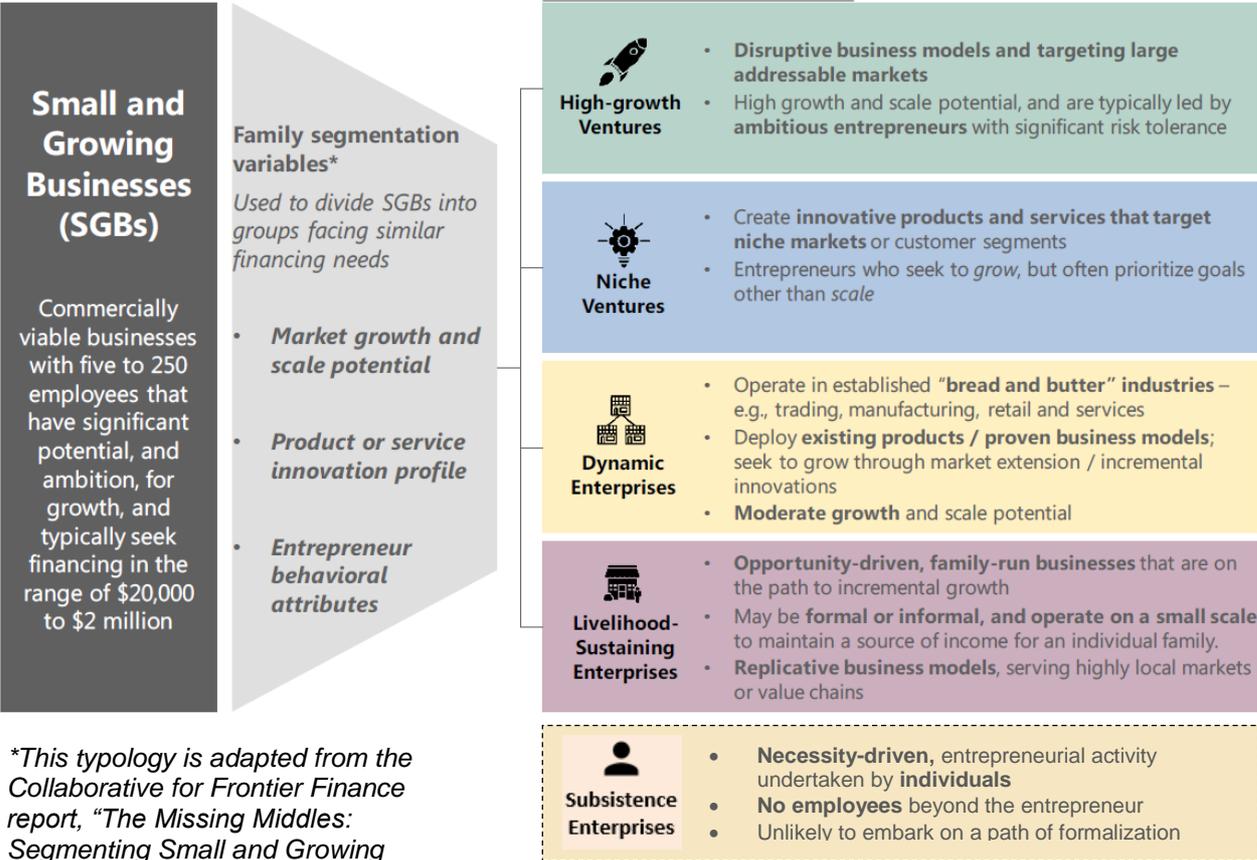
That leads us to ask what we know about identifying and selecting high-performance firms. The challenges of this are well known and many. Do we look for individual entrepreneurs (the jockeys) or instead firms in high-potential sectors (the horses)? What sources of information on those with more potential are available at a reasonable cost? And, independent of these selection issues, what is the role of training of entrepreneurs and managers?

All of the questions posed so far focus on the supply side of the equation. But demand for a firm’s output may instead be the key. Perhaps where demand for innovative products produced by reliable suppliers is evident, the entrepreneurs can sort out all of the supply constraints. Research focusing on how firms respond to sustained shocks to demand is more limited. But a review of that literature suggests that demand plays a key role in generating growth among small firms.

Our goal is both to synthesize what we have learned from research and identify important gaps in our knowledge. We close with a discussion of a forward-looking research agenda, enumerating issues that are both important and researchable.

**Figure 1: Typology of small firms in developing countries.\***

**Enterprise Segmentation Framework: Four Families of Small and Growing Businesses**



\*This typology is adapted from the Collaborative for Frontier Finance report, “The Missing Middles: Segmenting Small and Growing Businesses in Emerging Markets”, October 2018.

## What are the origins of successful firms in lower-income countries?

A logical question to motivate this review is to ask: What is the role of small firms in job creation, and in the creation of high-quality jobs in particular? Unfortunately, we lack the data needed to answer this question in almost every low- and middle-income country. Work by Haltiwanger and colleagues (Haltiwanger et al, 2013; Haltiwanger, 2015) addresses this question in the United States. Haltiwanger and colleagues are able to use data on the complete universe of firms in the U. S., with identifiers allowing firms to be linked across years. There are few middle-income countries with censuses of firms that can be linked to form a panel. And where they exist – for example, the Annual Survey of Industries in India – they are censuses of firms only above a certain size threshold.

One exception is Brazil, which has data allowing researchers to match employers and employees in all formal firms over a period of 25 years. While these data still exclude around 40 percent of the labor force that is informal, they arguably include the most important firms for job growth. Brummand and Connolly (2018) replicate the methodology of Haltiwanger and colleagues. They measure job creation and job destruction by firm size and age<sup>3</sup>, and also ask which types of firms create more stable employment. Stability of employment is a function of worker tenure or worker turnover. Relative to the U.S., a larger share of employment in Brazil is in small (1-49 employees) and young (1-10 years old) firms. But Brummand and Connolly find, consistent with the U.S., that young firms rather than small firms *per se*, are responsible for most of the job creation in Brazil.<sup>4</sup> The jobs created by small, young firms are also more stable than most. Workers have the longest tenure on the job in small, young firms and in large (500+ employees), mature (older than 10 years) firms.

Bernstein et al (2018) use the same dataset to examine the characteristics of owners of entering firms in municipalities whose primary activity is agriculture. This sample allows them to use exogenous shocks to local income arising from shocks to world prices of the specific crops that are grown in each municipality. That is, an increase in the world price of soybeans will lead to an increase in incomes in soybean-producing areas, but not in areas producing other crops. They find that the mainly service-sector firms that are formed in response to these local income shocks are started by entrepreneurs who are younger and more highly educated than entrants in more normal conditions.

While the comprehensive data from Brazil produce a clear picture, a lack of data mean that the analysis cannot be replicated in other low- and middle-income countries. An alternative

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<sup>3</sup> The RAIS data from Brazil does not report the firm age. Brummand and Connolly estimate firm age using the date of hire of the longest-tenured employee for firms that existed in the first year of their data (2004).

<sup>4</sup> Ayyagari, Demergic-Kunt and Maksimovic (2014) use the World Bank Enterprise Surveys (WBES) to examine the role of small firms in job creation. They use a cross-section of firms and a retrospective question on firm growth over the two years preceding the survey. But the authors note that their data only cover surviving firms (p. 77), a serious limitation with respect to the question of net job creation. Moreover, the WBES data are not censuses, and while Ayyagari et al note that “enquiries with the survey implementation team” (p. 80) indicate that the average survey response rate was 70% in the full sample, the rate appears to vary significantly across countries. For example, in the 2009 Cameroon WBES: “the number of contacted establishments per realized interview was 3.09 for the Enterprise Survey,” suggesting a response / eligibility rate of less than 33 percent (Cameroon Enterprise Survey Dataset.) Re-survey rates in the WBES panel surveys are particularly problematic. The report on the Nigeria 2014 WBES notes: “Item non-response, selection bias, and faulty sampling frames are not unique to Nigeria. All enterprise surveys suffer from these shortcomings, but in very few cases they have been made explicit.” (The Nigeria 2014 Enterprise Data Set, p. 13.) Resurvey rates for the panel data appear even more problematic; a significant share of firms are not found, and these may either have gone out of business or re-located, perhaps because they have grown. Given these issues, we do not view the findings based on the WBES to be reliable.

approach to understanding firm dynamics that is somewhat less demanding of fully comprehensive data is to ask what we know about the origins of larger firms, in particular whether the larger firms began as small firms. This is also, of course, a difficult question to answer, but one where individual survey work can hope to make some progress. One interesting example of this approach is John Sutton's series of *Enterprise Maps* in Ethiopia, Ghana, Mozambique, Tanzania and Zambia. The approach of Sutton and his collaborators is to select 50 or so "leading players" in the manufacturing sector of each country. The goal of the enterprise maps is to understand the industrial capabilities of each country, but Sutton and his collaborators also examine and describe the origin of the leading firms, providing us creation stories for each of these important enterprises. The samples are selected to reflect the leading companies spread across the most important manufacturing sectors of the economy.

Though there is variation across the countries, there are some general lessons. First, though a few of the leading firms started as microenterprises and grew large, that is not the usual route. In Ethiopia, for example, only two of the 50 largest firms started as small, local startups. Small-scale startups play a somewhat larger role in the other countries, but are never the origin for much more than one-quarter of the largest firms. Second, roughly one-fifth of the largest firms had foreign roots, and an additional one-fifth had public sector roots. Third, perhaps the most surprising finding is that traders started as many as half (in Ethiopia) of the largest manufacturing firms. Sutton and his co-authors explain this by noting that traders understand markets, for example because they import goods, and so know the characteristics of goods demanded by local markets. The importance of traders in the origins of larger firms suggests that the demand side of the market is important or, as Sutton and Kellow (2010) note trading "...is often where the deepest and most acute knowledge of local and international market conditions is already at hand." (p. 5). Finally, even within the five countries covered by Sutton's enterprise maps, there are exceptions to these patterns. In Mozambique, domestic start-ups are a much more important origin, with traders and the public sector firm the origin of only a small percentage of the largest industrial enterprises.<sup>5</sup>

The situation in the five African countries is quite distinct from south Asia. In Bangladesh, there are well over 1000 companies with more than 500 workers in the export-oriented garment sector alone. Pakistan has a more diversified manufacturing sector but, similar to Bangladesh, with a much larger number of large firms. Klepper and Mostafa (2018) describe the importance of a single firm in Bangladesh, Dosh Garments, to the growth of the garment sector there. A key to Dosh's influence was an early and heavy investment in human capital. Through a joint venture with the Korean firm Daewoo, Dosh's founder sent 126 workers to Korea to learn modern production techniques on the job working in a Daewoo factory. Although these workers had signed 5-year non-compete contracts, these were not enforced when the managers began leaving Dosh to start new firms as soon as a year later. Using data from more than a decade after Dosh's founding, Klepper and Mustafa show that a disproportionate number of the largest factories in Bangladesh hired managers trained through the Dosh-Daewoo venture when they started. Note that this kind of dynamic, sector-specific, growth is feasible only because firms are able to tap the enormous international demand through exporting.

Of course, even if large firms do not often grow up from smaller ones that does not imply that such transitions *should* be rare. Haltiwanger et al (2009) notes that more than a quarter of new employers in the U.S. started as non-employer firms, implying that even the own account workers can be an important source of job creation in well-functioning markets. Understanding

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<sup>5</sup> A related analysis is De Mel et al (2010), who compare characteristics of own account workers with characteristics of larger firm owners and wage workers, concluding that around three-quarters of the own-account workers have characteristics more like wage workers than larger firm owners. Muendler, Rauch and Tocoain (2012) use linked employer-employee data to examine the importance of spinoffs from existing enterprises in the creation of new enterprises in Brazil.

the constraints that prevent these transitions from occurring more regularly in developing countries is the focus of the remainder of this review.

## Constraints: An organizing framework

A simple structure for categorizing constraints to small business growth comes from the most general description of a firm's activities. Firms produce output using capital, labor and materials. How much output a firm obtains from the inputs it uses depends on how efficient the firm is. Economists typically describe these relationships using a production function, with firms combining capital (K) and labor (L) to produce output (Y) with varying efficiency (A). That is:  $Y = A f(K L)$ .<sup>6</sup> Output may fall short of potential output because there are constraints on the use of capital, constraints on the use of labor, or inefficiencies in the way these inputs are combined to produce outputs. This leads to a natural division of constraints into those related to capital (finance)<sup>7</sup>, those related to skills or matching issues in the labor market, and those related to total factory productivity. The last is the most complex, as efficiency of production will be affected by many issues, including which individuals choose to start firms, the incentives those individuals face, the ability to delegate, etc. We organize the review around this simple framework, asking what we have learned about constraints in each of these areas.

### I. Capital

Finance has long been viewed as the most important constraint by both researchers and entrepreneurs in low- and middle-income countries. As a result, the literature on constraints to capital is more established and extensive than that of most other constraints. In a seminal work, Rajan and Zingales (1998) show that sectors that are capital intensive are under-represented in countries with less developed capital markets. They show that in countries with less-developed capital markets, sectors that rely more on external finance grow more slowly *and* have lower rates of entry. This is a clever identification of the effect of financial constraints across a large number of high- and middle-income countries.<sup>8</sup>

Recently, the literature has taken a more micro- and experimental approach to the question of credit constraints. Much of the experimental literature is based on samples of microenterprises. With regard to capital in microenterprises, the state of the literature can be summarized as follows. Evidence from several experiments assigning grants to randomly selected enterprises indicates that marginal the return to capital is high, on average, in these enterprises. In contrast, randomized experiments providing standard loans to microenterprises show little or no effect of loans on enterprise profitability or sales. Recent work trying to bridge these somewhat conflicting results suggests that enterprise owners taking loans choose safer, lower-return investments. The terms of the loan contract (Fischer 2013; Field et al 2013) lead them to avoid riskier, higher-return investments. Ongoing work explores contracts that involve more risk-sharing, using equity or state-dependent debt payments. There are fewer studies on the

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<sup>6</sup> We ignore materials, though there is some research suggesting that access to materials matters. For example, Goldberg et al (2010) show that trade liberalization in India provided firms with access to higher-quality imported inputs and so allowed them to produce new products.

<sup>7</sup> In some contexts we might also be concerned with restrictions on the availability of capital. For example, machinery available in some countries may be subject to import restrictions in others. In this simplest construction of the production function, we ignore complementarity between capital and labor, but entrepreneurs may also lack access to the human capital necessary to operate machinery that would otherwise be optimal.

<sup>8</sup> Rajan and Zingales' sample is limited by the availability of data on accounting standards, and hence excludes the lowest-income countries.

effect of capital injections in larger firms. There are a couple of notable exceptions to this, which we discuss below.

The first randomized control trial examining the effect of capital on firms was conducted by De Mel et al (2008). Working in Sri Lanka, they distributed grants of USD100 or USD200 to a random subset of a sample of microenterprises. The grants allow them to isolate a shock to the supply of capital that is independent of any other characteristic of the firm.<sup>9</sup> Using the supply shock, they estimate that enterprises have average returns of 5-6 percent per month, representing annual returns of more than 60 percent. De Mel et al (2012) report on a longer-term follow-up of the enterprises, showing that the returns on the initial grants are sustained five to six years later. Fafchamps et al (2014) replicate the experiment in Ghana, again finding that marginal returns significantly exceed loan rates. In a similar experiment in Mexico, McKenzie and Woodruff (2008) find average returns of 20-30 percent per month.

An additional notable finding from these studies is that the effect of capital is very different in male- and female-owned businesses. De Mel et al (2008) estimate that marginal returns are almost twice the average in male-owned businesses, but near zero in female-owned businesses. Fafchamps et al (2014) find similar results for grants made in cash, but find positive returns in female-owned businesses for grants made in-kind (that is, through the purchase of assets for the business directly). De Mel et al (2009) examine the results for female-owned business in Sri Lanka more closely, finding evidence of positive returns to female-owned businesses in households where women have more say in decision-making, and higher returns in sectors like retail, in which both males and females operate.

Banerjee, Karlan and Zinman (2015) review six experiments randomizing access to microloans. The six studies use one of two different designs. The details of the design matter because those details affect how we should interpret the results. Each of the six experiments plays on one of two margins. Some randomize access to credit at the neighborhood or village level (Angelucci et al. (2015), Attanasio et al. (2015), Banerjee, Duflo et al. (2015), Crepon et al. (2015) and Tarozzi et al. (2015)), and the rest randomize credit to marginal clients within all neighborhoods or lender branches (Karlan and Zinman (2011); Augsburg et al. (2015)) using credit scores to identify the relevant sample. It is important to realize that in both of these designs, we are learning about the effects *expanding* microfinance beyond its current penetration rate. Significantly, we are not learning about the effect of microfinance on the *previously existing* borrowers.

For example, Karlan and Zinman sort applicants to their partner MFI according to their credit score. Applicants with scores of 60 or above are all offered loans; those with scores below 35 are all denied loans; and those with score between 35 and 59 are randomly sorted into a group that is offered a loan and a group that is not. This implies that we learn about the effect of loans for borrowers with credit scores between 35 and 59. We learn nothing about the effect of loans for borrowers with credit scores above 60, where, plausibly, the effect of credit is different, and perhaps larger. Similarly, although Banerjee, Duflo et al (2015) randomize at the neighborhood level, around 18 percent of households in their *control* neighborhoods obtain a microloan around the time of their experiment. The fact that the percentage in treatment neighborhoods (around 27 percent) is larger allows the researchers to estimate the effect of microcredit on various outcomes. But that effect is estimated on the nine percent of households that are marginal borrowers – those who would not borrow in the control neighborhoods, but do in the treatment neighborhoods. The effects on the sample affected by the experiment may be different from the average effect across all borrowers.

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<sup>9</sup> Nevertheless, the grant is not a perfectly clean injection of capital into the enterprise, because owners may either use their own resources to make complementary investments or de-capitalize the investment, for example, by drawing down inventories. De Mel et al also show that owners respond by increasing the hours they work in the enterprise, at least in the short-run.

With these caveats in mind, the experiments show that the credit has a limited effect on growth of micro-enterprises. With regard to enterprise outcomes, Banerjee, Karlan and Zinman (2015) summarize the results of the six studies as follows:

the lack of transformative effects is not for lack of trying in the sense of investment in business growth. There is pretty strong evidence that businesses expand, though the extent of expansion may be limited, and there are hints (eyeballing the pattern of positive coefficients across studies) that profits increase.

These findings are underwhelming in light of the much larger returns to capital found in experiments providing the capital shocks through grants. Meager (2018) analyzes the six *AEJ-Applied* studies plus Karlan and Zinman (2010) in a synthetic manner using Bayesian hierarchical analysis. She concludes that "...the impact on household business...is unlikely to be transformative and may even be negligible" (Meager 2018, abstract).

What might explain the different outcomes of grants and loans? Where loans are made with the group-lending model, Fischer (2013) suggests that group members might pressure others in the group to make lower-risk investments that are also lower-return investments. But many microlenders, including some of those in the studies summarized by Banerjee, Karlan and Zinman (2015) now make individual loans. In this context, Field et al (2013) suggest a different reason that borrowers may make investments that are sub-optimally risky. They conduct an experiment with an MFI in which some borrowers are randomly chosen to receive a two-month grace period – that is, they are given a two-month window after receiving their loan before they make their first loan payment. Field et al show that this grace period leads the entrepreneurs to make higher-return investments. But they also show that these investments are higher-risk and lead to much higher default rates by the borrowers. A structural model suggests that the grace period contract would not be profitable for the lender, even though the social returns to that contract exceed the social returns to the standard contract.

There is a more limited literature on the returns to capital among larger enterprises.<sup>10</sup> One entry in this literature is Banerjee and Duflo (2014), which uses changes policy setting the revenue threshold for lending set-asides in India between 1998 and 2000. These policy changes allow Banerjee and Duflo to identify credit supply shocks, and hence returns to borrowing among enterprises affected by the policy changes. The firms affected by the policy changes had capital stock of between INR 6.5 and 30 million, or roughly USD 150,000 to 750,000, so are 2-3 orders of magnitude larger than typical firms reached by the cash grant experiments and microlenders. Using the shocks to access, Banerjee and Duflo estimate returns to capital of nearly 90 percent per year, substantially higher than the interest rates charged on the loans.

A second indication of the value of credit in slightly larger firms comes from an experiment reported in McKenzie (2017) in Nigeria. McKenzie designed the experiment around a business plan competition (YouWiN!) conducted by the Nigerian government with the support of the UK Department for International Development and the World Bank. The business plans submitted by applicants were read and rated by judges. The 475 entrants rated highest nationally or in their region were declared winners and awarded a grant of USD 50,000. Another 1,841 entrants rated just below this highest group were named "semi-finalists", and 729 of these were then randomly selected and also awarded the grant. The random allocation of grants within

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<sup>10</sup> There is also an extensive literature using observational data to estimate firm production functions, whether using the proxy variable approach (Olley and Pakes, 1996; Levinsohn and Petrin, 2003; Akerberg, Caves and Frazer, 2015). See Gandhi, Navarro and Rivers (2016) for a recent application of this approach in developing countries.

the group of semi-finalists allows McKenzie to assess the impact of a substantial relaxation of the credit constraint, conditional on being good, but not great, in the eyes of the judges.<sup>11</sup>

Since the competition attracted both existing businesses and proposed new ventures, the results are differentiated into these two groups. Among start-ups, receipt of the grant leads a 37 percentage point increase in the likelihood of having a business three years later, and a 23 percentage point increase in the likelihood of having a business employing 10 or more workers. Among on-going businesses, grant winners were 20 (21) percentage points more likely to be in business (have 10 or more employees) three years later. This implies a cost per job created of USD9,600. McKenzie notes that measured profits are extremely noisy, and thus it is difficult to estimate the marginal returns on the grants. The regressions for both new and on-going businesses show significant effects on profits only in the second follow-up survey, and then for both groups, the return is a bit less than 1 percent per month. It's likely that these returns lag interest rates these sorts of firms would pay. Given the uniqueness of the very large grants provided, it is a bit hard to know how to generalize the results apart from the estimated returns to capital they generate. It seems likely that the employment outcomes, for example, would have been smaller if the capital had been given as loans rather than grants.<sup>12</sup>

### **Equity investment models**

If the grace-period loans implemented by Field et al (2013) lead to higher returns for enterprises, why are they not more profitable for lenders as well? Underlying their lack of appeal for lenders is the fact that lenders suffer the downside when the investments fail but do not capture the upside when the investments are successful. The obvious solution to this is some sort of equity contract that allows some risk (and reward) sharing by the investor. But there are challenges in microequity contracts given the lack of rigorous accounting and auditing standards and the lack of standard exit strategies for investors in these small firms. De Mel et al (2018) report on a failed micro-equity experiment in Sri Lanka. Several other micro-equity experiments are on-going in Pakistan, Kenya and Indonesia, though as yet there are no results from those studies.

Angel investors providing equity are active in many lower-income countries. But the networks of investors are informal and, so far as we are aware, there is no analysis of their outcomes. Angel and venture investors provide a combination of capital, personalized mentoring and other inputs. Identifying the effects of these contributions on firm growth is particularly challenging because angel and venture investors combine careful selection of enterprises with post-selection interventions. Research that credibly separates the selection effect from the investment effect is rare. One interesting attempt to isolate the investment / mentoring effect, albeit using data from the United States, is reported in Kerr et al (2011). The researchers use data from internal records of two angel investor groups in Southern California and Boston. The two groups use similar methods to select investees. Entrepreneurs make presentations in presence of many angel investors who are members. The records of Tech Coast Investors, the Californian group, include internal discussions on each of these "pitches" showing the level of support received by the pitch. Kerr et al show that no investor is interested in the majority (64 percent) of the ideas pitched to the group. The data also show that the probability of receiving funding jumps significantly after 20 angels express interest in funding the venture:

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<sup>11</sup> McKenzie's design also allows him to ask whether judges can predict which firms will grow faster, conditional on receiving the grant. We return to this comparison below.

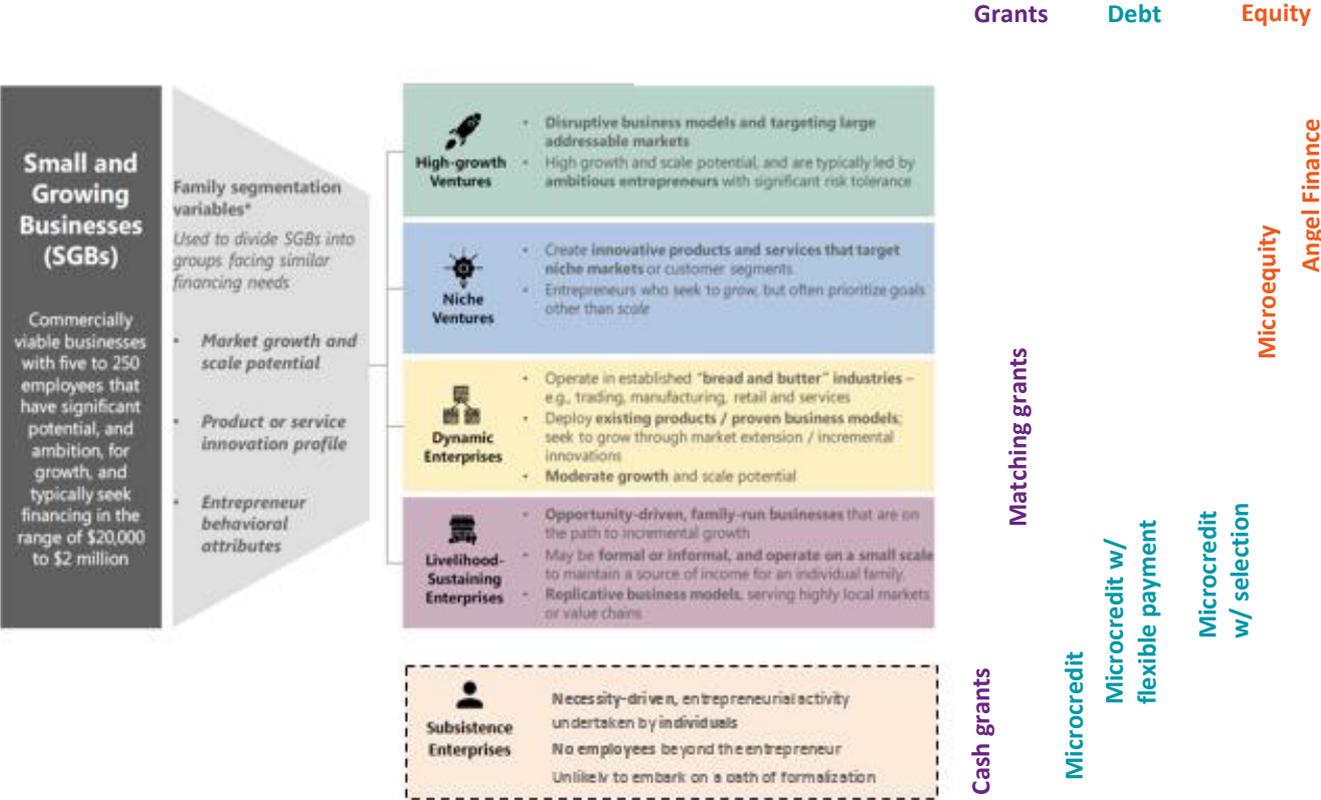
<sup>12</sup> We have ignored two other widely used schemes for financing SMEs: credit guarantee schemes and matching grant programs. Credible evaluations of the effectiveness of either of these are very scarce, though Campos et al (2015) provides a very useful description of attempts to assess matching grant programs in six African countries and Cowan et al (2015) assess the effectiveness of a credit guarantee scheme in Chile, finding that each additional USD of guarantee increased credit available to SMEs by \$0.65.

while 38 percent of ventures with interest expressed by 20 to 24 angels receive funding, only 17 percent of those with interest expressed by 15-19 angels receive funding. Kerr et al use the discrete jump in funding rates to compare the trajectories of 46 enterprises that were supported by 20-34 angels (“just funded”) with 41 that were supported by 10-19 angels (“almost but not funded”). A similar discontinuity is used to split 43 pitches to the Boston angel group that were close to a funding threshold. The logic behind this “regression discontinuity” approach is that the pitches falling just above or below the chosen thresholds are likely similar in potential but very different in the likelihood of receiving angel support. They therefore will differ in outcomes only (or at least mainly) because the group just above the cutoff received funding and related assistance from the angel group while the group just below did not.

The analysis by Kerr et al shows that these two U.S. angel investor groups have an important impact on the trajectory of enterprises. Using data four years after the funding decisions, those receiving funding are more than 20 percent more likely to have survived, and more than 16 percent more likely to have either had a successful exit or grown to at least 75 employees. We are unaware of any similar research in lower-income economies.

In sum, Figure 2 reproduces the small firm typology from Figure 1, and maps the various interventions covered in the review. The figure allows us to visually differentiate between standard microcredit contracts, which appear to limit innovation by borrowers and more flexible contract that are used by borrowers for more innovative investments.

**Figure 2: Capital interventions mapped to typology of small firms in developing countries.**



## II. Labor

Growing firms need to hire workers and, often, to hire more skilled workers. Their growth may be constrained if there are significant matching frictions in the labor market – that is, if firms face significant challenges locating and hiring the right workers. The matching of workers to jobs is a topic that has garnered some attention from researchers in the past decade. The literature has focused on matching in either unskilled or semi-skilled labor markets, which are the segments most applicable to most micro- and small-scale enterprises.<sup>13</sup> Most of the research has taken the perspective of workers rather than firms, though there are exceptions that measure the effect of overcoming matching frictions on productivity of firms.

The main takeaway from the research on labor markets for unskilled and semi-skilled workers is summarized by McKenzie (2017), who concludes: “urban labor markets appear to work reasonably well in many cases, with fewer market failures than is often thought .” (p. 127) As a result, “... traditional [active labor market policies] that focus on skill training, wage subsidies, and job search assistance have at best modest impacts in most circumstances.” (p. 129)

### Unskilled labor markets

We should expect match frictions to be least important among unskilled workers, and the existing experiments suggest this to be the case. In an experiment in Sri Lanka, De Mel et al (2019) ask whether microenterprises are constrained by access to labor. Starting with a sample of urban enterprises employing 0-2 paid workers, they offer a random subset of the firms incentives to hire an additional worker. The incentive pays a fixed amount of 4,000 LKR (\$35) per month for six months if the enterprise hires a fulltime worker from outside the family. There is a significant response to the incentives. Compared with the control-group enterprises, about one in seven treated firms hires an additional worker in response to the incentives. However, within six months of the removal of the wage subsidies, there is no difference between employment in treatment and control enterprises. Moreover, De Mel et al estimate that the increase in profits of the treated firms are not more than the amount of the subsidy. The results show little evidence of frictions in this context.

Hardy and McCasland (2017) conduct an experiment to examine whether firms in Ghana hire fewer than the optimal number of workers due to search and matching frictions. They intervene in the matching of apprentices to enterprises. Apprentices in Ghana typically make an upfront payment to firms for their positions, and receive wages based on firm output during the apprenticeship period. Hardy and McCasland model the upfront payment as a screening mechanism, which works because low-ability workers know they will not recoup the fee with their (low) output-based wages.<sup>14</sup> In the experiment, the researchers hold a series of matching meetings with enterprises interested in hiring apprentices and youth interested in apprenticeships. Following the meetings, enterprises are randomly matched with zero to eight apprentices. The 35 percent of the firms assigned no apprentices in the program serve as a control group against which to measure the effects of apprentices on enterprise outcomes. Hardy and McCasland show that the matching treatment indeed increased employment in enterprises assigned apprentices. They then show that the additional employment generated increases in sales and profits during the two-year apprenticeship period. Since apprentices might be paid less than market wages, it is not clear how we think of these returns relative to regular wage workers, though the results clearly indicate imperfections in the apprenticeship market.

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<sup>13</sup> There has also been a focus on youth, reflecting the importance of youth unemployment and the labor perspective that much of the research has taken.

<sup>14</sup> Hardy and McCasland’s experiment substitutes the monetary screening mechanism with a time-based screening mechanism, requiring youth interested in apprenticeships to attend a series of meetings.

Larger firms typically hire both unskilled and skilled workers. We discuss hiring of skilled workers below. With regard to unskilled workers, there is substantial turnover among workers in lower-skilled positions. Blattman and Dercon (2018), for example, conduct an experiment in five factories in Africa that randomly selects workers hired for entry-level positions from among a large pool of applicants. They find that one-third of those offered the job quit within a month, and three-quarters quit within a year. Menzel and Woodruff (2017) show substantially lower rates of exit among workers in large garment factories in Bangladesh, though even then almost one-third of workers leave in their first year. Whether these turnover rates are the result of poor matches or are part of more complex employment strategies of workers is difficult to say based on the evidence in these studies.

Note that the fact that the Blattman and Dercon's firms are willing to randomize the selection of workers by itself suggests that the firms believe they face low search frictions. Large numbers of applicants gather outside the factory gates looking for entry-level positions. But the high turnover rates may suggest that the firms don't understand how they should be selecting workers. The employers may focus on the technical skills required for the position, while perhaps matching on non-cognitive skills is more relevant.

A number of recent experiments use cognitive and non-cognitive testing in an attempt to improve matching between workers and firms. Some of the studies bundle skills training with matching. Taken together, the studies show that matching may be important for individuals who are disadvantaged in the labor markets.<sup>15</sup> Few of the studies are designed to measure outcomes on firms – that is, to measure whether reducing frictions in the labor market increases employment growth of firms.

An exception to this is the project by Alfonsi et al (2017). They conduct an interesting experiment comparing vocational training with wage subsidies that are designed to induce on-the-job training among unemployed youth in Uganda. Much of their project involves comparing these two models of providing skills to workers, which is outside the scope of this review. But one arm of the project randomizes the number of workers assigned to firms. That allows an estimate of the returns to the firms of hiring these workers. One caveat here is that the sample of workers is unemployed youth, and hence may not represent the returns to hiring by the firms without these constraints.

The analysis takes the workers' perspective, but results on firm-level outcomes are also reported. Consistent with de Mel et al (2019), Alfonsi et al do not find evidence of significant frictions in the matching of firms to workers. Absent the subsidies, only 13% (19%) of firms agree even to meet with the vocational trained workers (unskilled workers) matched to them by the researchers. They conclude that "In short, there is not much evidence for search frictions related to meeting untrained workers or meeting skilled workers in these labor markets." ( p. 12)

The Ugandan firms receiving the wage subsidies to train apprentices retain the majority of the workers hired for some period after the subsidy ends. But consistent with the lack of frictions in the matching market, essentially all of the workers have left within three years and there is full displacement so that treated firms are no larger than control firms two years after the experiment. (See Figure 4 of Alfonsi et al.) However, the treated firms are significantly more profitable over the post-treatment period, and the wage subsidies can account for only one-third of the increase in profitability. This implies either that the subsidized firms hire more productive workers than these firms typically hire, or that the subsidized firms retained a higher share of workers' output than they typically would. These changes are worth understanding in

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<sup>15</sup> See Groh et al (2016), Abebe et al (2016a, 2016b), Franklin (2016), Abebe, Caria and Ortiz-Espinosa (2018) and Bassi and Nansamba (2017).

more detail, but the central result here is that there is no evidence that firms are larger as a result of the increased incentives to hire workers.

From the workers' perspective, Alfonsi et al estimate that the returns to vocational training exceed 20%, while the returns to firm-level apprenticeship training are around 10%. It is worth pointing out that the researchers carefully selected the vocational training provider to choose what they felt was the best provider in the market. Thus, while the paper discusses the importance of credit constraints in limiting investment in skills, there may also be information constraints in that potential trainees are not informed about the highest-value providers. Nevertheless, the experiment shows the potential for both workers and firms of improving the skills of workers.

Alfonsi et al attribute the greater mobility of vocationally-trained workers relative to firm-trained (apprentice) workers to the certification that vocational training provides. Several other recent experiments examine the effect of skill certification on labor market outcomes. Certification may improve a given worker's outcome because she obtains a job instead of another (uncertified) worker. Alternatively, certification may improve job matches enough that firms, now employing better-matched workers, are more efficient, and so expand production and create new positions. Most of the experiments on certification take the perspective of the worker, and are not designed to measure the aggregate impact on employment. Nevertheless, improved outcomes from the worker's perspective are at least a necessary condition for certification to improve outcomes for firms.

As McKenzie's review notes, these experiments find no aggregate effects on job creation, even absent concerns for general equilibrium effects. There is evidence in some that workers are more likely to find formal work (Beam 2016; Abebe et al, 2018), and that the subsidies may help disadvantaged sub-samples gain employment (Abebe et al 2018).<sup>16</sup> Viewed from the perspective of constraints on firm growth, though, these studies generally support the conclusion that labor search costs per se are not likely a major constraint to firm growth.

## **Managers**

Experimental work to date has focused on matching frictions in unskilled or semi-skilled labor markets. Labor markets for managers may have much larger consequences for firms, especially as the firms grow to the point that hierarchies become efficient. This is, of course, a challenging area for research both because firms large enough to have managerial hierarchies are fewer in number and because the larger firms are generally less able to find time for researchers.

Bandiera et al (2017) collect time use data from 1,114 CEOs of firms in six countries. They ask each CEO's personal assistant to record all of the CEO's activities in a given week. Using these data and a machine learning algorithm, they classify CEOs as "managers" or "leaders". Managers have more one-on-one meetings with people inside the firm, and involve themselves in the details for production. Leaders have more meetings with multiple parties and people outside the firm. Bandiera et al show that leader CEOs run firms that are larger and more productive than the firms run by manager CEOs. Moreover, using a subsample of firms that change CEOs during the period covered by their productivity data, they show that performance of a firm improves after it hires a leader-type (rather than a manager-type) CEO. This leads them to ask whether firms make mistakes in hiring managers rather than leaders and if so, why they do so. Mapping their data to a simple model leads to the conclusion that firms are heterogeneous in needs – some firms benefit from manager-type CEO. But matching frictions

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<sup>16</sup> Using longer-term follow-up surveys, Abebe et al (2018) find that workers matched in their original treatment report earning 20 percent more and having jobs that make better use of their skills four years later. These outcomes provide an indirect suggestion of some efficiency gains at the firm level.

imply that even some firms that would benefit from leader-type CEOs end up with manager-types. This mismatching is much more prevalent in the lower-income countries (Brazil and India) in their sample.

Even with this difference-in-difference result, we might wonder whether the type of CEO hired is endogenous to the prospects of the firm. The data and analysis are nevertheless fascinating and illuminating, and the suggestion that mismatches of CEO types in lower-income countries is a potentially important source of lower productivity. One explanation for the greater number of mismatches in lower-income countries is that matching frictions are higher where trust is lower. A lack of trust may cause owners to limit the pool from which they select managers – in the extreme, for example, to family members. Moreover, leader-type CEOs must delegate detailed decision-making to subordinates. This delegation implies a level of trust, either in the individuals per se, or in the power of the incentives those individuals face. Bloom, Suddun and Van Reenen (2010) show that firms located in higher trust regions, or multinationals headquartered in higher-trust countries, have more decentralized decision-making processes and are therefore able to grow larger.<sup>17</sup>

Bloom et al (2018) suggests that trust can be created, at least to some degree. They report on a long-term follow-up of the management consulting intervention with textile factories in Mumbai, discussed in more detail later in the review. Their intervention improved recording keeping and communication among managers in the factories. The authors find that the firms receiving the consulting intervention are more likely to have expanded by establishing a new factory, suggesting an increased willingness to delegate and decentralize decision-making.

### **Skill acquisition on the job**

An additional issue related to labor is how, and how quickly, workers acquire skills on the job. While the general skills provided by pre-labor market education are important, data suggest that much of an experienced worker's human capital is acquired through experience on the job.<sup>18</sup> But there is evidence that the labor market returns to both education and experience are lower in low-income countries compared with high-income countries. For example, Lagokos et al (2018) compile data from labor surveys in 18 countries and show that the earnings-experience profile is twice as steep in high-income countries as it is in low-income countries. Assuming workers are paid proportionally to their productivity, this suggests that workers acquire skills on the job less quickly in lower-income countries. Data from standardized achievement tests administered across countries also suggest lower school quality in lower-income countries.<sup>19</sup>

There are at three candidates to explain the lower rate of return to experience in low-income countries. First, it may be that a year's experience leads to the acquisition of fewer skills in low-income countries. Perhaps lower quality schooling leaves workers ill-prepared to acquire more specific job-related skills while working. Or, perhaps firms provide workers with fewer opportunities to acquire skills on the job. Second, it may be that firms in developing countries

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<sup>17</sup> LaPorta et al (1997) show that the 25 largest publically traded firms are larger in countries with higher levels of trust, measured by responses to the World Value Survey generalized trust question. Laeven and Woodruff (2007) show that Mexican firms with better contract enforcement are larger. Boehm and Oberfield (2018) show that firms in Indian states where courts function better are larger and less vertically integrated, and Acemoglu, Johnson and Mitton (2009) show a similar pattern using cross-country data.

<sup>18</sup> In well-functioning labor markets, workers are paid according to their productivity, and so wages provide a measure of skills. Thus, we see positive correlations between earnings on the one hand and education and labor market experience on the other.

<sup>19</sup> Both PISA and TIMSS data show lower achievement in middle-income countries, on average. Coverage in low-income countries is limited in the standardized achievement exams. See <https://timssandpirls.bc.edu/> for TIMSS data and <https://www.oecd.org/pisa/> for PISA.

have weaker management practices, and the consequences of this on the productivity of workers may be greater further up the skill/experience gradient. Third, labor markets in low-income countries may be less effective at matching skilled workers to firms. There is relatively little research on these issues, particularly as they relate to small and medium-sized firms.

### **III. Managers and Entrepreneurs: Are they born or made?**

Even where enterprises have access to inputs, they may lack the know-how to combine those inputs into marketable outputs in an efficient manner. Using data from Brazil, for example, Ulyssea (2018) estimates that 91 percent of unregistered firms are either subsistence or rationally informal firms, with little prospect for dynamic growth. The other nine percent are actually constrained by informality. There are two immediate questions: How do we identify the nine percent? And, once identified, what interventions lead these higher-potential enterprises to become larger and more productive? This approach takes the view that entrepreneur / managers are both born and made and so, both selection and training affect enterprise growth.

#### **IIIA. Identifying innate entrepreneurial talent**

Predicting which businesses will succeed has proven very challenging even in the most predictable of circumstances and even by highly incentivized and skilled experts working for venture capital firms. But the sustained success of certain venture funds suggest that experts are able to do better than random guessing. Venture and angel financing are less well developed in lower-income countries, and, where they exist, they are not well studied. On a broader scale, business plan competitions are a common means of promoting entrepreneurship and encouraging entrepreneurs to turn ideas into firms. Technoserve for example, runs business plan competitions in several countries in Africa and Latin America, often aimed at highly educated wage workers with business ideas.<sup>20</sup> Business plan competitions have two goals, generating interest in entrepreneurship more generally and identifying entrepreneurs with the potential for rapid growth. But what if we are interested only in the selection part of the competitions? Are the competitions successful at selecting firms with greater growth potential and, if so, can we learn anything about selecting those individuals at a lower cost?

One approach to this question is to ask if standard survey information can predict higher-performing firms and, if so, whether the views of competition judges adds to these predictions. What should we expect to find? Kahneman and Klein (2009) examine studies comparing predictions by experts with predictions based on simple combinations of quantifiable variables. They conclude that the predictions of experts are likely to be most valuable when: 1) outcomes are reasonably predictable; 2) experts have extensive experience making similar judgments; and 3) the experts receive immediate feedback on the accuracy of their predictions. On the surface, none of these conditions hold in the game of predicting which enterprises are likely to grow fastest or benefit the most from some intervention. These outcomes are highly variable, and usually take quite a long time to be realized. Hence, we might expect to find that predictions from baseline measures might be more accurate.

With this exercise in mind, Fafchamps and Woodruff (2017) conduct a business plan competition in Ghana. Their 335 applicants were on-going small businesses across a range of sectors. The project generates three sources of information: data on the business and the entrepreneur collected at the start of the competition; the reports and ratings of the judges; and data from a follow-up surveys conducted 12 and 24 months after the competition. The

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<sup>20</sup> See <http://www.technoserve.org/files/downloads/swazi.pdf>.

follow-up data allow the researchers to measure survival and growth outcomes for each participating firm. They collapse the baseline data into three measures capturing ability (e.g., fluid reasoning and education), previous borrowing, and management practices. The ability measure is most strongly correlated with future outcomes. These three measures outperform expert options in a horse race, though Fafchamps and Woodruff show that the rating of the judges add predictive power even after controlling for the survey measures. One is also left with the view that neither the surveys nor the judges are able to predict much of the variation in future growth.

McKenzie and Sansone (2017) carry out a similar analysis using data from the YouWin! competition. They have a much larger sample and follow-up data from three years after the competition. Their findings align with those of Fafchamps and Woodruff in the sense that they find baseline data outperform the expert panels and neither predicts growth with much accuracy. They find, however, that the panel ratings are uncorrelated with growth outcomes. Note that one difference between the two competitions is that judges had live interviews with the entrepreneurs in the Fafchamps and Woodruff competition, but did not in the YouWin! competition. The differences in the ability of panelists to predict outcomes might come from the signals extracted in these live interviews or, alternatively, might reflect spurious outcomes given the small sample that Fafchamps and Woodruff work with.

An alternative approach to experts is to ask whether peers have information about which businesses are most likely to succeed, and if so, whether we can extract that information in an unbiased manner. Tapping into peer networks, of course, has a long heritage in development entrepreneurship. The approach was integral to the group lending model developed by Mohammad Yunas and Grameen Bank (Yunas 1989). Hussam et al (2017) carry out a project in Amravati, India that follows in this tradition. They work in with samples of subsistence businesses, but their approach may have applications to more dynamic firms as well. Hussam et al begin by dividing their sample into groups of five owners. They then ask each owner a series of questions about characteristics of the other members of their group. These include questions on education level, enterprise profits and, most importantly, how much the enterprise profits would increase if they invested an additional USD 100 in the business. The design incorporates random cash grants that allow the researchers to estimate the actual marginal returns to capital in the same sample of enterprises. Although it is not obvious we should expect peers to be able to predict marginal returns of other enterprises, Hussam et al show clear evidence that they are able to do so: enterprises ranked in the lower tercile of expected returns ex ante show no gain in profits after receiving the cash grant; those ranked in the top tercile of ex ante expected gains show increase in monthly profits of more than 20 percent of the grant. They also show that when the peers know that their evaluations will affect who receives the grants, their reports are biased in favor of family and friends. Hussam et al implement incentives for truthful reporting that, under certain conditions, they show do produce less biased and more accurate reports. Whether the conditions necessary for truthful reporting can be met in actual practice is unclear, but the work at least shows that peers have valuable information.

As in Fafchamps and Woodruff (2017) and McKenzie and Sansone (2017), Hussam et al compare the prediction of peers with predictions based on “hard” data from baseline surveys conducted with the entrepreneur herself. Consistent with Fafchamps and Woodruff, they find that predictions of the peers (“soft” data) are predictive above and beyond any prediction that can be gleaned from hard data. They compare predictions from machine learning models with the predictions of peers. They find that machine-learning predictions can also help to isolate the owners with higher marginal investment returns. Those in the highest tercile of predicted returns realize monthly returns of 18 percent in the grants experiment. But the soft information of peers has predictive power even after controlling for the hard survey responses. Again, the peers have sustained personal interaction with those they are judging, perhaps suggesting that this is crucial to the ability of judges to add value.

An alternative approach to predicting outcomes examines whether psychometric measures predict enterprise outcomes. The research in this area is perhaps most advanced on the narrower question of whether personality predicts loan repayment. Dlugosh et al (2107) conduct surveys with borrowers from banks making small-scale loans in Nairobi, Kenya. They combine the survey data with bank records to test whether personality measures – conscientiousness and extroversion from the Big 5 personality test and a measure of integrity – predict loan repayments. Like Hussam et al (2017), they worry that the respondents may misreport on surveys when they know that loan decisions will be based on their responses. So they also test for effects in conditions where respondents are told the responses will affect decisions (“high stakes”) and when they are told that the responses will not affect decisions (“low stakes”). Using a sample of more than 37,000 respondents in 14 countries, they show that respondents in high-stakes conditions do indeed misreport, giving responses showing higher levels of conscientiousness and integrity compared to responses in low-stakes settings. They then use data from two different samples in Kenya, one with high stakes and one with low stakes, to test whether the personality measures predict default. They find that the high-stakes data can be used to develop a model of default that is predictive in the high-stakes sample, but not the low-stakes sample, and vice-versa. Thus, the high-stakes responses are informative on loan repayment in spite of potential misreporting. This result differs from Hussam et al, who find that high-stakes conditions lead to biased reporting that is worse at predicting outcomes across cases. One possibility is that the differences in sampling methods – Hussam et al differentiate the high- and low-stakes using subsamples from a single sample, while Dlugosh et al use different samples – lead to the different results. But the results are both interesting enough that they merit more work in this area.

While the psychometric measures appear to be predictive for loan repayment, a common theme in the literature on selection of entrepreneurs is that entrepreneurial ability is the better predictor of firm growth. Ability is usually measured by some combination of fluid reasoning tests (e.g., Raven non-verbal reasoning tests), numeracy, years of schooling, and similar measures. De Mel et al find that higher-ability owners have higher marginal returns, and both Fafchamps and Woodruff (2017 ) and McKenzie and Sansone (2017) find that measures of ability predict growth. Fafchamps and Woodruff (2017) find no effect of attitude measures while Hussam et al (2017) find that several psychometric measures only weakly predict returns to capital in their experiment. The fact that panels and peers are able to predict when they have personal interaction with entrepreneurs (as in Fafchamps and Woodruff and Hussam et al) may suggest that we simply have not properly quantified in surveys the attitudes that matter for growth.

### **III B. Training entrepreneurs and managers**

If it is challenging to select entrepreneurs who are more likely to succeed, can we create entrepreneurs who are more likely to succeed? Attempts to build entrepreneurial skills have taken different routes. There are many group-training programs, the largest of which is likely the ILO programs on Start and Improve your Business, whose effectiveness has been examined in research. Researchers have also assessed the effectiveness of individualized consulting. More recently, projects have asked whether mentoring is an effective and scalable model. Finally, there is an increasing number of incubators and accelerators in lower-income countries. There is, to date, more limited evidence on their effectiveness.

McKenzie and Woodruff (2013) reviews the evidence on the effect of training on performance of micro- and small businesses. Reviewing 16 studies with plausible causal identification, they find little evidence that training leads to improved performance of enterprises. The majority of the studies use standard training programs like the ILO’s Start and Improve Your Business program, which focus on providing technical skills through lectures in a classroom setting, on

topics of record keeping and marketing.<sup>21</sup> They show that most of the individual studies are statistically underpowered, particularly on key outcomes like profits that are integral to cost-benefit calculations. The lack of statistical power comes from the combination of highly heterogeneous samples used in typical studies and high levels of variation in the key outcomes, rather than small sample sizes *per se*. However, given the substantial number of studies reviewed, the results have generally been interpreted as indicating that standard training programs have at most modest effects on enterprise performance. There are several important caveats and updates to this review, which we discuss here.

First, the underwhelming performance of standard training programs does not imply that training itself does not matter. Indeed, using data from seven countries, McKenzie and Woodruff (2017) show that the business practices that are the focus of the standard training programs are themselves highly correlated with differences in firm performance both in the cross section and in panel data. Firms implementing a larger share of 30 business practices relevant to microenterprises are larger, more profitable, more likely to grow over time, and less likely to shut down. Of course, these results are based on observational data, but at least the correlation between practices and enterprise performance is robust to including a large number of controls for owner ability, which is itself, not surprisingly, related to performance.

A key takeaway from this analysis is that the data on management practices and performance suggest that if enterprise owners actually implemented the practices they are taught in the training programs, we should expect to see a larger effect of the training on performance. The problem is that the enterprise owners implement very few additional best practices after participating in training sessions. McKenzie and Woodruff show that training programs that have shown large effects on management practice (for example, Anderson-MacDonald et al 2017) have also shown larger effects of the training on enterprise performance. In other words, the effectiveness of training delivery matters, and research suggests that most entrepreneurship training program fail because they fail to improve business practices.

Second, the realization that standard mass-delivered training programs are largely ineffective has led to experimentation with new approaches. Campos et al (2017) report on experiments with microenterprise owners in Togo comparing the effect of standard training with “personal initiative” psychological training. For these small-scale enterprises, they find that training on entrepreneurial psychology is more effective than standard business training, generating larger and more lasting effects on sales and profitability. They estimate that the USD756 per-participant cost of implementing the training program is recouped with increased profits in less than one year, producing returns of 140 to 393 percent.<sup>22</sup>

Anderson-MacDonald et al (2017) link small business owners in Uganda with mentors around the world via meetings over Skype. The mentors are typically MBAs and consultants. This is interesting because the mentors are likely to be very informed about good business practices generally, but may have little understanding of the Ugandan context. Hence, the project helps to inform us about the importance of this local context. Anderson-MacDonald et al find that the random subsample of firms assigned a Skype mentor show no improvement in business practices. However, they are significantly more likely to “pivot” their business, for example, by stopping the production of sale of one product line and starting a different product line. These preliminary results suggest that local knowledge or personal contact may be important to

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<sup>21</sup> The ILO uses a “training of trainers” model, which implies that training in specific locations is provided by independent training firms. This raises the question of how the quality of training relates to its effectiveness, something on which there is essentially no academic literature. We are unaware of any attempts to use lessons from the education literature to measure effectiveness of training programs.

<sup>22</sup> This is the return to the individual enterprise, not the social return. The experiment is not designed to determine how much of the increase in profits comes from business captured from non-participating firms.

induce changes in detailed practices, but new “big ideas” may be generated by more distance interactions.

Third there is much more limited evidence on the effectiveness of training for SMEs. But the evidence that is available suggests that individualized consulting programs for larger firms, while much more expensive, has notable effects on performance. The most widely cited study is Bloom et al (2012), who conduct an experiment with large textile factories in Mumbai, India. A sample of 17 firms (with 28 plants), is split into a treatment group of 11 and a control group of 6. The control firms receive a one-month intervention focused on record-keeping, which was deemed necessary both to retain their interest and to ensure the quality and comparability of the information reported. The treated firms received an additional four months of consulting services aimed at improving management practices. Using high-frequency data on output and quality defects, Bloom et al show that the intensive consulting intervention significantly increases output per worker and TFP, and significantly reduces inventory levels and the quality defect rate. They show that management, measured by 39 practices specific to textile production, improves. They estimate the changes resulted in an increase in profits of USD325,000 per year per firm, implying that the cost of the consulting, which they estimate as USD250,000, is recouped in less than a year. Why did managers not adopt the practices on their own? There are both proximate and deeper answers to this question. Using data that the consultants obtained from managers, Bloom et al show that the proximate reasons are either that the managers were unaware of the practice (most often for “uncommon” practices), or that they did not think that adopting the practices would be profitable (most often for “common” practices). Of course, one can then ask why the managers did not bother to become better informed, for example by hiring the consultants on their own. We speculate on these deeper causes below.

A second important study in this area is Bruhn et al (2018), who conduct an RCT with 432 micro-, small- and medium-sized firms in Puebla, Mexico to evaluate the effect of consulting and mentoring on firm growth. The 150 firms in their treatment group are much smaller than those in the Bloom et al study. Around 70 percent of the treated sample (108 of the 150) are classified as “micro” (and hence, presumably have fewer than 5 employees), while 34 are “small” and eight are “medium.” The treated firms received weekly four-hour sessions over a period of one year. The researchers find generally positive impacts on profitability and return on assets at the end the year of consulting, though these results are somewhat fragile in that they depend on the specification. The more impressive results come from data taken from the national Social Security system (IMSS) for as long as five years after treatment. These data show that, compared with firms in the control group, those receiving consulting services grew faster each year after the program, leading to a 57 percent growth in employment after five years, or 5.7 extra employees in each treated firm. These results should be interpreted with some caution for several reasons. First, the IMSS records on which they are based are available for just over half (57 percent) of their sample. One suspects that the smallest firms, for whom the treatment effect is probably smallest, are more likely to be unregistered with IMSS. Hence, the average impact may be overstated with respect to the sample as a whole. Second, this issue is exacerbated by the fact that, for privacy reasons, the researchers obtained only aggregated data from IMSS. That is, they have total employment for the treatment group and total employment for the control group. We therefore cannot tell whether the growth comes from a few firms or is spread more widely across the sample.<sup>23</sup> Survey data indicate that the consulting led most directly to improvements in marketing and recordkeeping in the treated firms.

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<sup>23</sup> De Mel et al (2012), for example, find significant average treatment effects from formalization driven entirely by very large changes in a very small number of firms. They discuss the concerns of interpreting these results.

Although effective in terms of average employment growth, the cost-effectiveness is somewhat difficult to assess given the aggregation of the data available. The researchers estimate the cost of consulting was almost \$12,000 per firm, with 70-90 percent of that cost paid by the government. At 5.7 jobs per treated firm, that suggest a cost per job of around \$2,000, which compares quite favorably with other programs aimed at creating jobs. By way of comparison, McKenzie (2016) estimates the cost of creating a job with the grants given to winners of the YouWin! Competition in Nigeria is around USD9,600. McKenzie (2017) shows that the average cost of creating a job through 9 vocational training programs assessed with experiments is USD17,000 - USD60,000.<sup>24</sup> While Bruhn et al lack long-term data on profits, they note that the profit per worker would not need to be large for the intervention to pay for itself. The difficulty in interpreting comes from the fact that Bruhn et al do not have individual firm-level data at follow-up. Baseline firm size is highly right-skewed, with a sample of 108 microenterprises and eight enterprises at least an order of magnitude larger. It seems unlikely that the majority of the microenterprises in the sample would find a USD12,000 consulting intervention viable were they to have to pay the full cost, but the data don't allow us to judge that supposition one way or the other. But even if that is correct, it suggests that the firms that were larger at baseline gained even more from the consulting, so the puzzle of why those firms did not previously use consultants is even more puzzling.

While there is evidence that individualized consulting can be effective, then, the model is expensive. Firms appear unwilling to pay the costs directly, even though the large benefits that researchers have quantified are internalized by the recipient firm. One response to this is to attempt to simplify and lower the cost of management interventions, and there are several ongoing projects focused on models to deliver similar outcomes at lower costs.<sup>25</sup> Note that Bruhn et al make the point that the changes the firms make after receiving the consulting services are both idiosyncratic and complex, so it is not obvious that these attempts at simplification will work.

A key question in this literature is how to fund the training. Although Bloom et al show that the returns to very intensive management consulting are reasonably high, the market for these services has been slow to develop. Firms appear reluctant to commit to paying for the training. Why? Academics often debate the “external validity” of empirical results, the extent to which lessons from one specific study are applicable to other contexts. Many of us would be optimistic that the lessons from Mumbai have implications in other countries and industries. But is it unreasonable for the owner of a scrap metal factory in Kenya (for example) to ask whether there is evidence that high-cost consulting would be profitable for him? It is reasonable to ask whether and how the generation of knowledge will ultimately lead to firms engaging consultants more.

An alternative approach is to ask under what circumstances we observe the endogenous development of local markets for consulting services. That is, what are the conditions – competitive pressure, export opportunities, etc. – that induce firms to struggle to improve efficiency, and how do they accomplish that? (See, for example, Bloom, Sadun and Van Reenen, 2015.) Alternatively, we might ask whether there are models that break learning into smaller steps that might be adopted incrementally. The feasibility of the incremental approach depends on whether the lessons are effective when implemented one at a time, or whether multiple changes need to be implemented simultaneously to be effective. For example, whether more effective advertising increases a retailer's sales may depend whether the retailer

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<sup>24</sup> In their ‘Aspire’ business plan competition, Fafchamps and Quinn (2016) estimate a cost of USD1,250 per job created. Note that McKenzie's calculation accounts for the cost of running the competition itself, while the Aspire estimate is based only on the cost of the awards given to the competition winners.

<sup>25</sup> Van Reenan and Suri are working with the African Management Institute and firms in Kenya and Tanzania to evaluate the effect of a program combining on-line learning with consulting. (See <https://pedl.cepr.org/node/6003>)

implements practices for monitoring stock levels, so that products are available to meet any increase in demand generated by the advertising. If the changes that firms need to make are complementary to one another, then they will need to be learned and implemented all at once to be effective. In this event, an incremental approach may simply lead firms to conclude that each individual change learned from the training, mentor, or consultant, has no effect.

### **Peer interactions and mentoring**

An alternative approach to learning that has shown some potential to increase growth of small and medium-sized firms is facilitating peer interactions and / or mentoring. Fafchamps and Quinn (2016) and Cai and Szeidl (2017) carry out field experiments that bring business owners together in a structured manner, and hence generate networking among the business owners. They then ask whether the networks that are created in their experiments lead to knowledge-sharing and increases in firm growth and profitability.

Fafchamps and Quinn (2016) work in three African countries, randomly assigning experienced business owners to panels judging a business plan competition. They are interested in learning whether the network links created among the panel judges as a result of working together during the competition leads the judges to share business knowledge, and hence to adopt practices in their firms that were more common among other firms on their panel before the panels were formed. They show some evidence of networking effects on compliance with a VAT law that was passed around the same time, but little evidence of transmission in other areas. Note that the statistical power of the experiment is limited both by the relatively small sample size and the limited period of interaction among judges.

Building significantly on this example, Cai and Szeidl (2017) conduct a randomized experiment in China with 2,820 firm owners that brings the 1,500 firm owners in the treatment group together in groups of 10 for monthly discussions. In collaboration with the Nanchang Commission of Industry and Information Technology, the authors invited all SME enterprises established within three years of the beginning of the experiment in 2013 to participate. From more than 5,000 expressions of interest, they selected a sample of 2,820 small and medium firms (with an average employment of 36). The sample was then randomized into 1,320 control and 1,500 treatment enterprises. The treatment firms were organized into 150 groups of 10 firms each. The groups were of four types: i) small size, same sector, ii) large size, same sector; iii) mixed size, same sector; iv) mixed size, mixed sector. An initial meeting was held with each group at CIIT offices, after which the owners were encouraged to self-organize additional monthly meetings for the following year. Compliance with the request to organize and participate in these meetings was very high (87%), suggesting that owners found the meetings useful.

The relatively large sample size and segmentation allows for a nuanced analysis of the results of the experiment. First, comparing the performance of enterprises in the treatment group with those in the control group, Cai and Szeidl find that the meetings lead to an increase in both the scale and profitability of the enterprises. Sales of treatment firms increase by 8 to 10 percent relative to the control firms, with comparable increases in material inputs, employment and assets. Why did the interactions lead to an increase in firm growth? Cai and Szeidl show evidence on several channels. First, there is evidence that firms share information on trading partners, with the number of referrals to trading partners and the number of direct relationships between firms in the group both significantly higher with treatment. Second, there is evidence the owners learn better management practices from one another. At the end of the year, they show that firms in the treatment group have significantly better management practice scores than those in the control group. Indeed, the improvement in management practices generated by the peer-interactions is comparable to that generated by the USD250,000 consulting intervention carried in India discussed above.

Evidence that the outcomes were the result of learning from other firms in the group comes from two sources. First, firms randomized into groups with higher-quality peers (measured by baseline firm size) showed larger increase in sales, profits, and management practices than those randomized into groups with weaker peers.<sup>26</sup> Second, Cai and Szeidl carry out an additional experiment by providing selected members of each group information about either a savings product or a grant program. This additional experiment allows them to trace information flows more directly, by asking group members who did not receive the information directly whether they are aware of the programs. The results on this additional experiment provide important lessons for scaling up the experiment. Specifically, information on the savings product flows through all of the groups and all of the group members. But information on the grants flows only when the members are not direct competitors.

Taken together, the experiment suggests that the optimal mentoring relationships are those where the firms share some characteristics – suppliers, common production techniques, etc. – but are not direct competitors. Although the study is carried out in only a single location, it is cleanly constructed and statistically well powered.<sup>27</sup>

Mentors and role models may be more effective than classroom training because they provide localized information that is customized to the individual business. Brooks et al (2018) design an experiment to test this proposition. The Brooks et al design compares standard business training with mentoring in a sample of 372 female-owned microenterprises on the outskirts of Nairobi, Kenya. The sample is split into a group receiving classroom training (which shows no effect), a group assigned to mentors and a control group. The mentors are successful business owners from the same community and sector of activity as the treated enterprise. The mentor-mentee pairs were required / encouraged to meet weekly at the mentor's place of business four times over a month, though many pairs continued to meet for more than a year beyond the official treatment period. Mentors were offered compensation of 1000 KSH, equivalent to two days profit for the typical mentor.

While the experimental sample here is not selected to be “high-growth”, the outcomes on the effect of mentoring may nonetheless be informative. The experiment shows a substantial short-term effect of mentoring, with profits of treated enterprises increasing by 20 percent. But the effects are short-lived and disappear about a year after the treatment begins. The mentor treatment appears to be effective while the mentor-mentee relationship is most active and disappears as the incentives provided to the mentors are removed.<sup>28</sup> While showing some initial promise, the sample size in the study is not sufficient either to determine where mentoring is most effective, or the circumstances associated with it continuing beyond the experimental period.

## **Incubators and accelerators**

Business hubs offer several potential benefits for startup businesses. The first comes from proximity to like-minded entrepreneurs. This creates, as Alfred Marshall (1890) noted, a confluence of knowledge that “as it were, in the air” of the community. By bringing together a

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<sup>26</sup> We refer to this intervention as one of peer interactions, but the result that being matched with higher-quality peers is important raises the question of whether this should instead be thought of as mentoring.

<sup>27</sup> A related paper is Giorcelli (2018), who uses data from Italian firms that participated in a program to improve management that was part of the Marshall Plan following WW II. An important component of the program was “study tours” to the U.S., where Italian managers visited factories in similar lines of business. Giorcelli shows that networking with the more efficient U.S. firms had positive effects on productivity and employment growth for the Italian firms for two decades after the program.

<sup>28</sup> There is also evidence from experiments that role models can be effective at increasing performance of microenterprises. (See Lafortune et al, 2017 and Dalton et al, 2018) These lighter touch intervention may be more relevant to microenterprises, and hence is not discussed in more detail here.

number of firms, the hubs also lower the cost of providing peer interactions, mentoring and other services of particular value to startups. Finally, given the weaker business environments that characterize many lower-income countries, business hubs may also improve outcomes by, for example, increasing the reliability of electricity and other public services and offer some protection against rent-seeking bureaucrats.

Accelerators are distinct from hubs in that they aim to work with distinct cohorts young firms for a limited period of time with the explicit goal of accelerating growth of the enterprises (Roberts et al 2017). There is a greater focus on mentoring and networks and less focus on provision of basic infrastructure like secure electricity and fast internet service. Indeed, Roberts et al (2017) report that in survey responses, participating entrepreneurs report that networks are the most important contribution of accelerators, listing in descending order of importance mentors, other participating entrepreneurs and, finally, investors.

We would like to know if and how accelerators lead to higher survival rates or faster growth of startup ventures. An immediate challenge in answering this question is that, in addition to providing support services, accelerators aim to select and enroll ventures with the highest potential for growth. Thus, like angel and venture investors, they combine selection with provision of inputs. The fact that participants are purposefully selected makes it more difficult to identify the impact of the accelerator services themselves.

Gonzalez-Uribe and Leatherbee (2017) tackle this challenge using a regression discontinuity design with a single very large accelerator program, StartUp Chile. Between its founding in 2010 and 2015, when the researchers collected data for their study, the accelerator had accepted 1000 ventures from among 6000 applicants.<sup>29</sup> Applicants are accepted in cohorts of 100 and remain in the program for six months. Successful applicants are provided with free office space and a grant of USD40,000. Each application is rated by three to five experts organized by YouNoodle and located (generally) outside of Chile. The quantitative rankings provide a discontinuity for acceptance into the program, with the marginally selected applicants thus being similar to the marginally rejected applicants. Regression discontinuity designs face a trade-off between comparability of the treatment and comparison sample on the one hand and sample size on the other. The further from the acceptance threshold we go, the larger but less comparable is the sample. The comparison of participants and non-participants across the threshold in the StartUp Chile analysis is aided by several features of this setting. First, the large number of applicants means that we are likely to find a reasonable large sample close to the threshold. Second, the applicants all receive a quantitative score, which can be used as a control for differences in enterprise potential. Finally, the fact that they all participate in the same program helps with the precision of estimated effects, since the treatment is the same for all participants.

Gonzalez-Uribe and Leatherbee show that ventures selected to participate in the program are more likely to raise subsequent finance, to survive and to have a web presence than those not selected. However, the analysis shows that these effects are entirely driven by selection of higher-quality ventures into the program. The basic accelerator program – the office space, capital grant, and complementary services – has no additional effect on these outcomes. But StartUp Chile has another interesting feature: roughly 20 percent of those selected to participate are offered a place in an “entrepreneurship school”. The selection is competitive with quantitative scoring, so again, Gonzalez-Uribe and Leatherbee are able to exploit a discontinuity at the selection boundary.<sup>30</sup> Comparing venture just above and just below the 20

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<sup>29</sup> Gonzalez-Uribe and Leatherbee use data from seven cohorts, with 616 participants and 2,642 non-participants.

<sup>30</sup> Since the numbers here are smaller, we might worry a bit more about differences between the ventures selected for the schooling and those just below the selection threshold. In addition, the researchers note that “These participants are the poster children of the program: their names are

percent selection threshold, the researchers find that the schooling does significantly improve the performance of ventures, even after controlling for selection effects.<sup>31</sup>

Roberts et al (2017) carry out a similar exercise using data from a large number of accelerators in nine countries, including six emerging markets. The researchers conduct an impressive data-gathering effort, beginning with a sample of almost 1,421 applicants to 42 accelerators, including 662 applicants to programs in the six emerging markets.<sup>32</sup> They combine data from applications with follow-up survey data with the aim of understanding whether accelerators affect the trajectory of firms. Indeed, they find that ventures accepted into the accelerator programs have significantly superior growth outcomes compared to those rejected in the selection process. In particular, comparing participating with rejected applicants in the six emerging markets, the data show that participating firms have faster revenue and employment growth, and larger increase in both debt and equity capital. The magnitudes of the differences are economically important in all cases, but statistically significant at the .05 level (as reported) only for the two outcomes related to external finance.

Using data from a large number of accelerator programs has both advantages and disadvantages compared to the single-program evaluation reported in Gonzalez-Uribe and Leatehrbee. On the one hand, the external validity of the study is enhanced. But the variation in what each program provides makes it difficult to determine what specific aspects of accelerators are important. Moreover, the smaller sample size gives some reasons for concerns about the comparability of the ventures selected and not selected in the programs. The superior outcomes of participants will also reflect the combination of selection of enterprises with greater potential and the effect of the accelerator's value added.<sup>33</sup>

Ideally, our understanding of accelerators would build on the type of analysis carried out by Gonzalez-Uribe and Leatehrbee, who use a single large program to isolate the effect of a specific component of the program. We would like to understand more about which components of the accelerator bundle are the most important, and how the answer to this question varies with the context in which the accelerator operates.<sup>34</sup>

Figure 3 maps the entrepreneur selection and training interventions to the typology in a manner similar to the capital interventions shown on Figure 2. While many of these intervention might be applied across all typologies – mentoring, for example – others, like business plan competitions and individualized consulting, are costly enough that they are likely to be viable only in the higher growth, higher innovation parts of the small firm spectrum.

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advertised on the webpage of Start-Up Chile and in news releases" (p. 8), implying that selection into the school may be bundled with other benefits to the selected ventures.

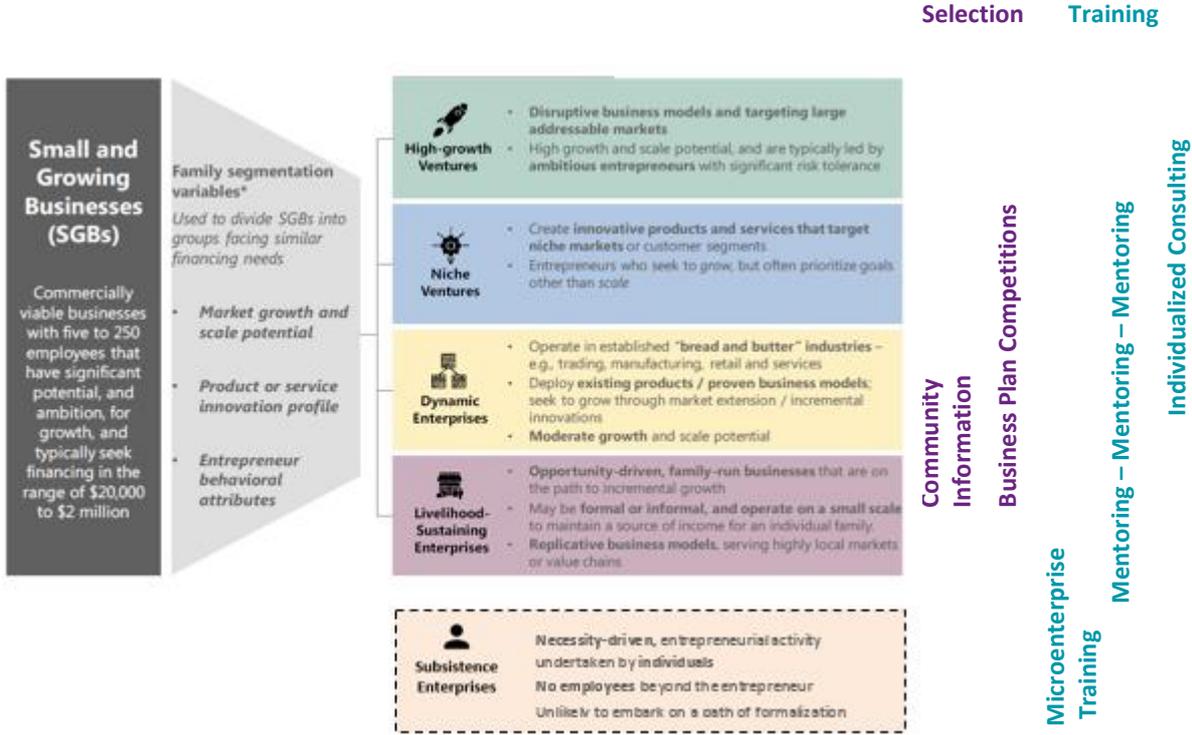
<sup>31</sup> As Gonzalez-Uribe and Letherbee make clear, obtaining data for the analysis is challenging. They use a combination of surveys of applicants (9 percent response rate), surveys of participants (with a 60 percent response rate) and measures from scraping the web. The more significant effects from the schooling may be driving in part by higher quality data – and hence, more precise measures – related to that threshold.

<sup>32</sup> These samples are obtained from almost 2,500 applicants to the accelerator programs between 2013 and 2015. The final samples include those applicants responding to a follow-up survey. The response rates varied from 77 percent for participants to 47 percent for rejected applicants in emerging markets.

<sup>33</sup> The baseline differences are apparent in Appendix C of Roberts et al (2017). See Kerr et al (2011) for a discussion of the bias in results from comparing full samples of applicants to angel investors and samples that are close to the funding threshold.

<sup>34</sup> A substantial part of the research on accelerators focuses on outcomes for the accelerator itself – survival, the level of support, the number of applicants, etc. In the interest of space we do not review that research here, but Ganamotse et al (2017) and the articles referenced within provides an entry into the literature.

**Figure 3: Entrepreneur selection and training interventions mapped to typology of small firms in developing countries.**



**IV. Creating demand**

Thus far, the discussion has focused mainly on supply side factors. This is in keeping with the literature, which largely takes a supply-side approach to these issues. But it has long been recognized that shocks to demand can stimulate growth of firms and job creation generally.<sup>35</sup> More recently, several studies have attempted to isolate the effect on firm productivity and growth of demand shocks in local markets.

Demand is limited by local markets. For example, if transportation across two markets is not possible, then a high productivity producer in Market A will not capture customers in Market B, and therefore will not force the lower-productivity producer out of that market. Ghani et al (2014) examine the effect of transportation costs on productivity in the manufacturing sector in India, using the construction of the Golden Quadrilateral highway system as a shock to transportation costs. They show that the reduction in transportation costs led to a relocation of production to districts closer to the highway. The rate of entry of new firms doubled and incumbent firms increased in size. By lowering input costs<sup>36</sup> and increasing access to markets, the highway system shifted output to more productive firms.

But transportation costs are not the only reason that high-productivity producers may find it difficult to capture customers from lower-productivity producers. Customers may lack the information about prices or quality that is necessary to make informed decisions, or lack trust in unfamiliar suppliers (McMillan and Woodruff, 1999). Andrabi et al (2017) conduct an experiment in private schools in Pakistan, providing parents with “report cards” on achievements of students in the schools. They show that improving the information available

<sup>35</sup> See, for example, Tendler and Alves Amorim (1996) and Tendler (1997).  
<sup>36</sup> A related paper by Asturias et al (2018) builds a model to trade to show that the highway system increase manufacturing output by 2.7% by increasing competition and lowering markups.

to parents leads to increased competition among schools, manifested by increased quality and lower prices among private schools. Jensen and Miller (2018) use a natural experiment that increased the spread of information about the price and quality of boats purchased by fishermen in Kerala, India. Prior to the spread of mobile phones, fishermen both sold their catch and purchased their boats almost exclusively in local markets. Jensen (2007) shows that cell phones allowed fishermen to quickly determine prices being paid in various markets along the coast before landing with their catch. This led them to sell more frequently in markets outside their own village. Jensen and Miller (2018) show that the interaction with fishermen in other villages increased the knowledge of boat builders in those villages. This led to increased demand for the most productive boat builders and a loss of demand, and often exit, for the least productive boat builders. They estimate that productivity in the boat building industry increased by more than a quarter.<sup>37</sup>

Demand shocks may come from access to foreign as well and domestic markets. There is an extensive literature on the importance of access to foreign markets on the dynamics of firm growth. The standard prediction is in line with the Jensen and Miller results: access to foreign markets allows the most productive firms to grow while the least productive shrink and exit. De Loecker and Goldberg (2014) provide a review. There is one particularly illuminating study, however, that merits some discussion. Atkin et al (2017) conduct an experiment that opens international markets to a randomly selected subset of very small carpet-makers in Egypt. The researchers work through an NGO that attempts to link for artisanal producers (Aid to Artisans) to buyers in high-income countries. In this case, the producers made carpets for the domestic market, and were offered orders to produce a very different style of carpet for customers in Germany, Israel and other countries. They show that the link to the export market led to an increase in product quality and revenue per hour, even though productivity measured as (quality un-adjusted) square feet per hour decreased. Most impressively, the increase in quality came without any significant investment in capital stock and without any formal training, though the researchers document important feedback from the intermediary.

While the experiment generates unique and quite rich insight into the underlying changes from the combined shock to demand and quality, the direct implications for development policy are less clear. As the authors note, Aid for Artisans indicates that six in seven attempts to build export links fail and, indeed, this case would likely have been one of the six if the researchers had not been persisting partners.

Government is the largest purchaser of goods in almost every economy. Ferraz, Finan and Szerman (2017) use data from the national procurement system in Brazil to examine the effect on firm growth of demand shocks created by winning procurement contracts. Brazil holds an online auction for procurement of goods by the national government. The authors compare post-auction trajectories of firms that win and the second-highest bidder in a subset of auctions where the gap between the bids is less than 1 percent and both bids were received within 30 seconds of the (random) ending time for the auction. They are able to link the procurement outcomes to matched employer-employee data, which allows them to observe firm growth subsequent to winning or just losing the auction. They find that winning an auction is associated with a modest but significant increase in employment (2.2 percentage points) an effect that, importantly, endures well beyond the life of the specific contract.

Finally, many governments in low- and middle-income countries have programs that attempt to link local SMEs to the supply chains for exporters, which is another vehicle for creating shocks to demand for SMEs. In a very recent working paper, Alfaro-Urena et al (2018) examine the effect of a Costa Rican government program linking domestic firms to multinational supply chains. Using Value Added Tax data that allows them to observe the all firm-to-firm

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<sup>37</sup> Interestingly, as the most productive firms grew in size, their workers became more specialized as well, working on fewer tasks in the production process.

transactions, and data on winners and close losers of the procurement competition, they show that firms winning contracts with multinationals experience enduring increases in productivity. Several other papers examine the effect of entry by large multinational retailers (e.g., Walmart) on local producers in middle-income countries. Javorcik and Li (2013) show that entry into Romania by large foreign retailers between 1997 and 2005 led to a roughly 10 percentage point increase in average (total factor) productivity of manufacturing firms in sectors that supply these retailers, like food and beverages. The increase in productivity is equal parts within firm and across firm. That is, suppliers to the foreign retailers increase productivity, and the foreign retailers purchase a larger share of output from more productive firms within any narrow sector. locavone et al (2015) show similar patterns following Walmart's entry into Mexico. These papers suggest that tapping the supply chains of large multinational firms can lead to opportunities for growth and productivity improvement among SMEs, especially the most productive of the SMEs.

In sum, there is increasing evidence that demand is an important determinant of small firm dynamics. Frictions in goods markets arise from many sources – inadequate transportation networks, weak information flows, lack of formal contract enforcement undermining trust in unknown trading partners. These frictions weaken the power of the market to reward the most productive firms and punish the least productive. Increasing market access can therefore have an effect on the dynamics of firm growth. Our knowledge in this area is still quite limited, and it is ripe for further work.

## V. Concluding remarks and a research agenda

The paper reviews the academic research on constraints to small and growing businesses. Our understanding of constraints has improved significantly in the past couple of decades, but the advances have been uneven. We summarize the lessons and the research opportunities in each of the areas.

*Capital:* The research is most developed for microenterprises. Evidence that marginal returns to capital are high comes from several randomized evaluations allocating grants to microenterprises. Micro credit appears to have less substantial effects, with one study suggesting that typical micro credit contracts lead borrowers to low-risk, low-return investments. There are several ongoing projects examining micro equity or more flexible debt contracts, and we view this as an area with potential.

*Labor:* The limited available evidence suggests that markets for unskilled workers function well enough that unskilled workers are not a constraint. But there are two potential issues related to skilled workers. First, we know much less about how frictions in the matching skilled workers to firms affects productivity and growth of firms. Second, we know little about the market for managers. And third, there is evidence that firms and workers invest less in skills on the job in lower-income countries compared with higher income countries. We see these three as areas where more research would be helpful.

*Efficiency – Selection:* The majority owners of the smallest firms have little aspiration for growth. A challenge is identifying those firms and ventures with greater potential. The low success rates in the highly sophisticated venture capital industry highlights the challenge in doing this. Business plan competitions, survey diagnostics on ability and management practices, and information from within entrepreneurial communities have all shown some promise on the selection issue, but more work is needed on this issue.

*Efficiency – Training:* Research shows that standard group training aimed at small business owners has limited effectiveness. More recent work shows that individual or group mentoring

is more effective, though ideally we would know more about when mentoring works and what types of matches are most effective. Individualized and intensive consulting has also been shown to be effective. But consulting is expensive. A challenge there, and indeed, with training more generally, is convincing firms that they should pay for the consulting services themselves.

*Demand:* Most of the research on small firms has focused on relaxing supply-side constraints. But there is evidence that goods markets function poorly in many low- and middle-income countries. The poorly functioning goods markets limit the demand for goods and services from the most productive firms, and allow firms with lower productivity to continue to operate. Understanding how to reduce frictions in goods markets is a key area for research.

*Job creation and quality:* We obviously would like to understand the role of small firms in job creation. This is a big ask. A viable answer requires that we take into account general equilibrium effects in a manner that is usually not feasible in careful microeconomic analysis. And the lack of high-quality data sets covering the full economy make careful macroeconomic analysis infeasible in lower- and middle-income countries. There is scope for understanding the quality of jobs that are being created: wage rates, working conditions, opportunities for acquisition of skills by workers, etc. We suggest that, absent breakthroughs on the data front, the agenda focus on the issue of job quality in small and growing businesses.

*Gender:* Research shows that some interventions have different effects on females and males. This is clearest in research on capital grants, where the analysis points to additional constraints faced by women who own and manage businesses while bearing a disproportionate share of the responsibilities in the household. Research that differentiates between female- and male-owned businesses across the broader spectrum of interventions is needed to develop the most effective interventions for both female and male owners.

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