FIRMS, WORKERS AND LABOR MARKETS*

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Abstract

This paper provides a selective review of evidence from labor markets in low-income countries. The aim is to synthesize this literature to consolidate what is known about the key drivers of worker outcomes (including those of micro-entrepreneurs), firm behavior, and the interaction between firms and workers. We draw on cross-country and within-country evidence utilizing a wide range of research designs, as well as novel evidence from ongoing studies. On firms, we discuss the firm size distribution, constraints to firm expansion, and informality. On workers we discuss the role of training, non-cognitive skills and the worker-firm matching process. Throughout, we place emphasize on understanding the role of institutions and the state in determining these outcomes.

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1 Introduction

This paper reviews evidence on some aspects related to labor markets in low-income countries. Our aim is to synthesize some key lessons from this literature, consolidating what is known about the key drivers of worker outcomes (including those of micro-entrepreneurs), firm behavior, and the interaction between firms and workers in labor markets as a whole. Throughout, we place emphasize on understanding the role of institutions and the state in determining these outcomes.

The concept of institutions we utilize is broad, ranging from the interventionist role of the state in labor markets, to underlying economic features of labor markets in low-income settings. Examples of the kinds of institutions we discuss relate to labor market regulations that firms face, licensing or customs requirements, the functioning of the judicial system, the entrenchment of private property rights, and the stability of the political environment faced. An example of an institutional feature we discuss relating to underlying economic characteristics of labor markets include informational asymmetries between workers and firms.

Understanding the interlinkages between labor markets and such institutions is important from both a macroeconomic and microeconomic perspective. Labor markets play a central role in the economic development of countries. Most models of aggregate growth imply long run output depends on the ability of workers and capital to be allocated to the sectors in which the returns to their labor are highest. There also exists a large class of models highlighting links between macro-intermediation, entrepreneurship and growth that emphasizes improvements in financial intermediation spurs firm investment and income growth [Evans and Jovanovic 1989, Banerjee and Newman 1993, Galor and Zeira 1993, Buera *et al.* 2011].[1] From a microeconomic perspective, labor is the fundamental factor endowment that all the worlds' poor start their lives with: being able to optimally invest in the accumulation of human capital and to earn returns from such investments in the labor market are key to lifetime welfare.[2]

We draw on cross-country and within-country evidence, as well as novel evidence from ongoing studies. The cross-country evidence we draw on is derived from the World Bank Enterprise Survey (WBES): this is a firm-level survey that covers a representative sample of registered private-sector firms with five or more employees. The data were collected between 2006 and 2011. The WBES covers topics predominantly related to the business environment and the constraints faced by firms.[3] The within-country studies we draw on utilize a wide range of experimental and non-

[1] Another paper in this evidence review, Ayyagari *et al.* [2016] synthesizes the literature on firm financing, institutions and growth in developing countries.

[2] Banerjee and Duflo [2007] document how the poorest lack land and productive assets. In south Asia, it is well established that the rural landless poor mostly allocate their time towards forms of casual wage labor. According to the Indian NSS, 46% of the female rural workforce have agricultural wage employment as their main occupation, and 98% of agricultural wage employment is through casual employment typified by spot markets, not long-run contracts [Kaur 2014].

[3] The sampling unit of the WBES is the "establishment": a physical location where business is carried out. As the survey describes, each sampling unit must "make its own financial decisions and have its own financial statements separate from those of the firm" and it must "have its one management and control over its payroll."

experimental research designs. We do not aim for our review to be exhaustive of all the relevant literature or topics: rather we focus on a few key lessons that the body of work has established with regards to the functioning of labor markets and how this relates to institutions, and identify important gaps for future work to address.

2 Firms

2.1 Firm Size Distribution

The firm size distribution in most low-income countries is positively skewed relative to the distribution in richer countries, such as the United States. Figure 1 draws together evidence on firm sizes from four developing countries: Uganda, India, Indonesia and Mexico, and compares these to what is observed in the United States. The top panel of Figure 1 shows in the four developing countries, there are very few firms that employee more than 10 employees. The United States has a lower share of small firms (defined as those firms with between 2 and 5 employees), and a higher share of firms in all other size bin-categories (6-10, 11-20, 21-50, 51+ employees). The lower panel in Figure 1 shows that as a result, in the United States the majority of workers employed in firms with at least 51 employees; in the four low-income countries, the majority of workers are employed in firms with at most 20 employees.

These figures highlight the firm size distribution is quite similar across low-income countries: the modal group are firms of size 0-9 full-time employees in all four countries. The WBES data only covers registered firms, and so does not shed much light on the informal economy. If such informal firms were included, we would expect the resulting firm size distribution to be even more skewed. The second feature to emphasize is that the proportion of very large firms does vary across low-income countries. In Mexico for example, almost as many workers are employed in firms of size 50+ than in firms of size 1-9. Hence throughout our discussion, we will highlight the differences in institutional environment faced by small and large firms.

This skewed firm size distribution relative to more advanced economies has spurred much debate about the causes and consequences of the 'missing middle', and whether institutional features of developing countries are responsible for this outcome. This is important if small and medium size enterprises (SMEs) are truly the engines of economic growth, creating employment and adding value. If so, the relaxation of constraints on SMEs will, in the short run, lead to an expansion in the size of SMEs with concomitant impacts on employment, and potentially on productivity and profitability. In the long run, relaxing such constraints allows a better allocation of entrepreneurial talent thus spurring economy wide growth [Lucas 1978].[4]

The World Bank Enterprise Survey data are computed directly by the World Bank and made available on the website http://www.enterprisesurveys.org/.

[4]Teal [2016] shows that the number of jobs in Ghana's manufacturing sector expanded rapidly over the period

The kinds of constraints relevant for SMEs fall into two broad groups. First, there is an established literature emphasizing that SMEs face more binding constraints, relative to large firms, related to input markets, where credit and labor market imperfections have been most studied. An older and parallel literature has emphasized that institutional constraints, such as state regulations, registration/licensing requirements, taxes, insecure property rights and so on, can also play an important role in determining the firm size distribution [Harris and Todaro 1970, De Soto 1989, Tybout 2000].

With improvements in the availability and comparability of detailed firm level data across countries, researchers have been able to revisit the issue of the firm size distribution. Hsieh and Olken [2014] do so, using data from India, Indonesia and Mexico. To understand whether there is a missing middle, they examine whether SMEs appear to operate at the efficient scale of production. Assuming a Cobb-Douglas production function, the marginal and average product of labor are proportional to each other. This insight avoids having to calculate the marginal product of labor directly, that would otherwise require estimating firm production functions directly. To operationalize the insight, they use the average revenue product of labor (ARP_L), defined as the value added per worker, as a proxy for the average product of labor. Figure 2 shows their graphs of how the ARP_L varies over firm size. Strikingly they find that for each country, the ARP_L is *unimodal* and *increasing* in firm size: this is contrary to the textbook view of constrained SMEs and will no doubt rightly spur further study, that can help reconcile the macro and micro evidence on whether SME really are constrained and operating at an inefficient scale.

Figure 3 collates data from some prominent studies to show parts of the firm size distribution have been focused on in micro studies of constraints to SME expansion: there has been a slight concentration of studies of micro-entrepreneurs, those firms operating with zero or one employee. There remains a relative scarcity of studies focusing on firms of size 1-9 employees, that as Figure 1 highlighted, remains the most important segment of the firm size distribution in low-income settings. The study of micro-entrepreneurs is of course important and we will return to the issue throughout, especially on what is known about the nature of self-selection into micro-entrepreneurship. More precisely, whether the low marginal productivity of these firms is indicative of individuals entering such activities primarily as a form of insurance against idiosyncratic income risk, or whether they really are a stepping stone towards creating larger firms.

Siba and Soderbom [2011] provide a detailed analysis of firm dynamics in Ethiopia. A motivating fact for their study is that 60% of firms entering the Ethiopian manufacturing sector exit within three years. Their study seeks to shed light on two questions: (i) why do young firms have such high exit rates?; (ii) how do productivity, prices and demand evolve in the initial years following entry? Using detailed data on output prices, the authors are able to distinguish between price and productivity effects and thus shed some light on whether young firms are less

from 1987 to 2003, almost entirely in small firms.

productive or just face higher demand constraints/lower prices. The authors use data on a panel of Ethiopian manufacturing firms collected from 1996 to 2006 and including 1000 firms with 10 or more employees. Their main findings are: (i) young and small firms are more likely to exit relative to established and larger firms: higher output demand has a positive impact on survival, but productivity has little impact on firm survival; (ii) market entrants have lower revenue based productivity, driven mainly by higher demand constraints; they find little evidence of productivity differences between entrants and incumbents.

Gallipoli and Goyette [2015] provide insights on how institutions can distort the firm size distribution in a low-income setting. They study distortions arising from tax liabilities and credit constraints for firms in Uganda. They embed a key feature of the tax audit system in Uganda, that leads to the probability of a firm being audited to increase sharply for firms with more than 30 employees, into an other standard model of firm growth based on Hopenhayn [1992]. They also allow for credit market imperfections that arise due to imperfect enforceability of contracts. This results in lenders asking for collateral to guarantee loans, and so the lack of collateral prevents some entrepreneurs from borrowing their desired amount. The parameters of the model are in part calibrated and in part estimated by matching moments to firm level data. The model is used to compare the benchmark equilibrium to counterfactual scenarios assuming no tax distortions, perfect capital markets *etc.* Moving from the benchmark world to the first best would increase output per worker by between 52 and 94%. However, the vast majority of the efficiency loss is attributable to credit constraints rather than tax audits, although the way in which the tax audit system works is what drives the missing middle and skewed firm size distribution.

The remains enormous scope for future work to use similar structural approaches to estimating economy-wide distortions to the firm size distribution and firm productivity resulting from regulations, interventions and other features of markets in low-income settings.[5]

2.2 The Desire of Firms to Expand

We present novel descriptive evidence on the desire to expand employment in SMEs as expressed by firm owners in Uganda. This evidence is based on an ongoing study that covers a nationally representative sample of SMEs operating in eight sectors in Uganda: motor-mechanics, plumbing, catering, tailoring, hairdressing, construction and electrical wiring. This corresponds to a large share of all SMEs in Uganda. The sample covers firms with between 1 and 15 employees with the median firm size being 3 employees. The final sample is 2300 firms, that are representative of SMEs in these eight sectors across urban Uganda. This represents a relatively large sample of firms compared to other publicly available data sets from Uganda. For example, the WBES

[5]In a similar methodological spirit, Garicano *et al.* [2016] study the distortionary effects of Employment Protection Legislation (EPL) on the size and productivity distribution of firms in France. The study is motivated by the fact that EPL becomes particularly onerous for firms with more than 50 employees.

Uganda sample from 2013 covers 546 firms.[6]

Panels A to C in Figure 4 reports firms owners desire to expand based on baseline interviews in our ongoing study. The majority of SMEs report a desire to expand scale: 55% report wanting to increase by at least one worker (recall that the median firm starts with three employees), 30% report wanting to at least double their size, and 15% report already being at their ideal employment scale. This finding is robust across firm size, ages and sectors. Panel D then provides evidence on the *actual* changes in firm size over the year prior to the survey. We observe that 45% of firms have no change in size, while 32% (20%) increase (decrease) employment.

Although there remains much work to understand the desires and long run ambitions of firm owners, and the dynamics of firm size, taken together this evidence suggests firms do want to expand size, and a significant fraction of them might face constraints to do so. We now turn to discuss what is known about these constraints.

2.3 Constraints Firms Face

The WBES is an important source of information on the cross-country differences in the constraints to expansion that firms report facing. The WBES allows us to build a descriptive evidence base for those across countries and across firms of different size: we classify firms as being small if they have between 5 and 19 employees, and as large if they have between 20 and 99 employees. Importantly, the WBES data highlights the importance of a wide range of constraints, not just those that have been mostly studied in the economics literature, and as such can provide a clear pathway towards the types of barrier that might have been hitherto relatively understudied.

Figures 5A and 5B highlight that across a range of low-income countries, there are multiple relevant constraints that firms report facing to expansion, and that the relative importance of these constraints differ across small and large firms in the same country. Given the focus of this paper, we note that institutional constraints cover a range of factors including taxes firms are liable for, licensing/customs requirements, the prevalence of crime/reliability of courts, labor regulations, and corruption/stability. Among small firms, such institutional constraints are prominent in India, Zambia, Sierra Leone, Rwanda, Mozambique and Liberia. In this set of countries, institutional constraints are more important for larger firms, as shown in Figure 5B. The countries in Figures 5A and 5B are ordered in descending order of GDP. This is done to highlight that there is no clear relationship between constraints and GDP per capita, and this applies to all the constraints shown, not just those related to institutions.[7]

Figure 6 unpacks institutional constraints into their various subcomponents, by country and

[6] An alternative data source would be the Global Entrepreneurship Monitor Adult Population Survey (GEM) that took place over the period 2008-10. These are individual-level surveys with a focus on entrepreneurial activity and aspirations. The GEM Uganda sample from 2010 covers 760 firms.

[7] Countries are ranked according to their per capita GDP in 2006 based on purchasing power parity (PPP), using the World Bank's International Comparison Program database.

firm size. This reveals that taxes are the dominant institutional constraint to expansion that small firms report facing across countries: as discussed later, poorly designed tax regimes might leave many smaller firms better off remaining unregistered in the informal sector. Among large firms, corruption and instability are relatively more frequently cited, and this is especially so in Bangladesh, Sierra Leone and Liberia. To get a clearer sense of how the importance of different types of institutional constraint differ across small and large firms, Figure 7 shows a scatter plot of these institutional constraint ranks. On the whole, each type of institutional constraint is similarly ranked across the firm size distribution in the same country.

For some of these institutional constraints, the evidence base on how firms respond to changes in them remains scarce and future work should be encouraged. A prominent study on labour regulation is Besley and Burgess [2004], who exploit differences in labour regulation across Indian states and over time to estimate their impact on firm performance. They find that more pro-worker regulations lower output, employment and investment in the registered manufacturing sector and increase output in the informal sector. On corruption, Fisman and Svensson [2007] using self-reported bribery payments, find that corruption has a strong negative effect on firm growth in Uganda. Cai *et al.* [2011], using an alternative measure of bribery, also find that corruption had a strong negative effect of firm performance, but this effect is much weaker if firms are located in cities with low quality government services, if they are subject to severe government expropriation and if they do not have a strong relationship with clients and suppliers.

These papers provide a basis for future work, and highlight the need for a parallel political economy literature to develop to understand what drives the initial formation of labor regulations, the development of the tax system, and anti-corruption policies in the first place.

We next return to the micro-evidence on constraints SMEs face using our data from ongoing work in Uganda. To underpin the validity of the information from this sample, Figure 8 shows how the aggregate evidence related to the importance of labor and credit constraints obtained from our sample of firms relates to the same statistics as obtained in WBES sample of firms. We see that: (i) across countries in the WBES sample, Uganda ranks relatively highly in firm owners reporting both forms of constraint as limiting employment expansion; (ii) the percentage of firms owners reporting each constraint (labor- or capital-related) is similar between the WBES Uganda sample and our study sample: in both, the majority of firms report such constraints as being relevant.

The top part of Figure 9 then shows self-reported constraints to expansion from our sample of Ugandan SMEs: these are grouped into labor-related constraints, capital-related constraints, and other constraints (that includes the institutional environment as being a constraining factor). We see that all three dimensions of constraint are important for SMEs in Uganda in the eight sectors of study. More specifically, within labor constraints, the data suggests search and matching frictions prevent firms hiring suitable workers, where suitability can be defined as either the skills of workers, their willingness to work, their trustworthiness, or based on some other trait. We return below to examine studies trying to uncover more direct evidence on the nature and importance

of such search and matching frictions. On credit-related constraints, both the availability of capital/machinery and sources of financing of purchasing such machines appear constraints to SME expansion. Finally, we highlight that among our sample, constraints related to the institutional environment are cited as the single most frequent obstacle for SMEs expanding employment.

The lower panel in Figure 9 complements this evidence by showing self-reported causes of stock-outs for firms, that again might be indicative of them being constrained in their operations along margins other than employment. As reported by SME owners, the incidence of stock-outs is related to the lack of working capital (that again highlights the importance of credit constraints), as well as poor management practices. The reliability of suppliers does not appear to be a key reason for stock outs in this context, that might indicate that the fact that contracts are not perfectly enforceable is not in itself a major impediment on firms relative to input market constraints related to labor and capital. Along these lines, Macchiavello and Marjoria [2015] provide evidence on the nature and impacts of inter-firm contracts in the context of the Kenyan rose sector. While the volume of trade is reduced due to a lack of contractual enforcement, they show that seller's reputation and relational contracting are key to understanding firm outcomes. Macchiavello and Miquel-Florensa [2016] study similar contracting issues in the context of coffee production in Costa Rica, studying whether relational contracts or vertical integration are used to overcome inefficiencies due to contractual incompleteness. This work is opening up interesting avenues for research at the nexus of industrial organization and organizational economics that can help shed light on strategic firm interactions in low-income settings.

2.4 Evidence on Relaxing Constraints

Much of the literature has focused on constraints to small firm expansion arising from input markets, especially capital and labor markets. Here we review the evidence on the impacts of relaxing capital constraints, both on existing SMEs and on the creation of new micro-enterprises. We then review evidence related to wage subsidies, information asymmetries at the point of hiring labor, the provision of entrepreneurial skills, and evaluations of combined asset and skill transfers. The backdrop to much of this evidence is the missing middle debate: if firms already operate at the efficient scale, then attempting to relax constraints related to labor hires, say, will just lead to full crowding out of new hires, and no net change in total employment.[8] Finally, we note that although most of the literature has studied one constraint in isolation, there is increased recognition that firms typically face multiple constraints simultaneously and the most effective interventions might target more than one dimension at the same time [Karlan and Fischer 2015].

[8]There are methodological challenges in all such work. For example, de Mel *et al.* [2009] provide evidence on how to best record micro-enterprise profits in low-income contexts. SMEs in developing countries generally do not keep financial record, firm owners may be reluctant to reveal earnings for fear that the information may be used for tax purposes (recall the importance of tax related constraints reported in the WBES).

2.4.1 Capital

A growing body of evidence suggests firms in low-income countries are constrained in their access to finance [de Mel *et al.* 2008a, Banerjee and Duflo 2014]. One way to establish the existence of capital constraints is to see if firms are characterized by high average returns to capital [Anagol and Udry 2006, de Mel *et al.* 2008, 2011, Fafchamps *et al.* 2011].

Banerjee and Duflo [2014] study whether relatively large firms in India are credit constrained by exploiting variation in access to directed credit. As a result of a policy reform in 1998, a group of Indian firms gained eligibility to a directed lending program. This group of firms lost eligibility in 2000 following another policy reform. The trends in sales and profits of these firms are compared to those of firms that were already eligible for the directed lending program before 1998 and remained eligible after 2000. They find that once firms become eligible, they expand their total borrowing and when they lose eligibility they reduce their total borrowings. Therefore, firms do not just use the directed credit to substitute other (more expensive) sources of credit. This implies that firms are in fact credit constrained. For these large firms, the authors estimate the marginal productivity of capital to be very high (around 89%), well above formal interest rates, and so highlighting the degree to which large firms are credit constrained.

de Mel *et al.* [2008a] estimate returns to capital in micro-enterprises in Sri Lanka. They do so using a randomized control trial (RCT), providing capital grants to micro-entrepreneurs. The estimated average returns to capital are high, around 5% per month, and so on the order of 60% per year (so again well above market interest rates). However, there is significant variation in the returns to capital among their sample of micro-entrepreneurs: 60% of women and about 20% of men micro-entrepreneurs have returns lower than market interest rates. The study shows that returns are higher for more constrained entrepreneurs (those identified to have less access to liquidity to begin with). On the other hand, they find no evidence that individual traits of micro-entrepreneurs, such as the risk aversion or uncertainty faced, drive heterogeneous returns to capital. This indicates that imperfections in credit markets, rather than a lack of insurance, creates a significant constraint to expansion for micro-entrepreneurs in their setting.

A number of studies have investigated whether the *form* in which capital is provided to micro-entrepreneurs matters for firm outcomes. Fafchamps *et al.* [2014] test whether cash grants and in-kind grants have the same impact on micro-enterprise growth in Ghana. A sample of male and female business owners with no paid employees was randomly divided into a control and two treatment groups: the first treatment group received an unconditional cash grant of $120; the second received an in-kind grant of $120 in equipment/inventory/materials, according to the owners stated preferences. The findings revealed large average returns of in-kind grants, but among women, in-kind grants increased profits only for the enterprises that were more asset-rich to begin with. Cash grants had lower average returns, and actually had zero return for women micro-entrepreneurs. For them, cash grants were used predominantly for consumption: this might

well be the case if there are imperfect insurance markets so the ability to smooth consumption in the face of idiosyncratic income risk is limited. The study is important because it clearly highlights that cash transfers alone may be insufficient to spur SME expansion, especially in the presence of related market imperfections, such as those in insurance markets.

On direct access to credit for existing micro-entrepreneurs, de Mel *et al.* [2011] provide non-experimental evidence on the matter, following on from the findings in de Mel *et al.* [2008] that estimated high returns to capital in micro-enterprises in Sri Lanka. de Mel *et al.* [2011] test for the role of information in improving access to credit, through an information intervention: 383 micro-enterprises were sent a letter informing them of a loan product already available on the market. In addition to providing information, the intervention also aimed to relax requirements on the loan-application procedure, such as reducing the number of guarantors from two to one. All businesses operating in an area were offered the loan, with businesses operating in a neighboring area defined as the control group using a difference-in-difference research strategy. Just over 60% of entrepreneurs eligible for the treatment attended an initial meeting where information was provided. Of these, 41 entrepreneurs submitted an application and 38 (10% of the original sample) were eventually given a loan. There is evidence that the firms that did not apply for the loans were still credit constrained, with the main reason they did not apply to the loan being difficulty in meeting the application criteria rather than lack of demand for credit. Using the difference-in-difference research design, the study concludes the program raised loans in the area by 6-7% relative to the neighboring area that did not receive the intervention, and the estimated return to the loan is of the order of 5-6%. These are comparable to the average returns found by the authors in previous studies, such as de Mel *et al.* [2008].

In terms of the relationship between credit and micro-enterprise start-ups, many evaluations of microfinance have now taken place, and the emerging view is that such interventions do not have strong impacts on the creation of *new* businesses [Karlan and Zinman 2011, Kaboski and Townsend 2011, Banerjee *et al.* 2015, Crepon *et al.* 2015, Karlan *et al.* 2015]. On the other hand, the provision of unconditional cash transfers can induce successful transitions into micro-entrepreneurship. For example, Blattman *et al.* [2014] study a program in Uganda's conflict-affected north, in which youths were invited to form groups and submit grant proposals for vocational training and business start-up. Funding was randomly assigned among screened and eligible groups. Treatment groups received unsupervised grants of $382 per member. They find that after four years, grant recipients invested in tools and materials, and half practiced a skilled trade. Relative to the control group, the program increased business assets by 57%, work hours by 17%, and earnings by 38%. Many also formalize their enterprises and hire labor.[9]

Finally, there is a nascent literature on identifying entrepreneurs. Clearly, not everyone should

[9]Fafchamps and Quinn [2016a] present evidence that giving US$1,000 cash transfers to winners of a business plan competition in Africa, led to sizeable impacts on self-employment activity (relative to runners up in the competition).

be an entrepreneur so there are important selection and policy targeting issues to be understood: while subsistence entrepreneurship can be preferable to outside options in the labor market, such occupations often have limited potential for growth. There thus remains a pressing need to thus understand who becomes an entrepreneur, what are their motives for becoming self-employed, and how can potential entrepreneurs be targeted *ex ante* [Fafchamps and Woodruff 2014]. Blattman and Dercon [2016] provide some important new evidence in this direction: they randomized entry level applicants to five industrial firms in Ethiopia to one of three treatment arms: an industrial job offer; a control group; or an entrepreneurship program of $300 plus business training. Following individuals for a year, they find that most applicants quit the industrial sector quickly, finding industrial jobs unpleasant and risky (but that they understood these risks *ex ante*, and used the time to search on-the-job). The entrepreneurship program stimulated self-employment, raised earnings by 33%, provided steady work hours, and halved the likelihood of taking an industrial job in future.

2.4.2 Labor

Wage subsidies are commonly used by governments to reduce unemployment or to sustain employment during downturns. There is some suggestion that by increasing labor market attachment for individuals, short-term wage subsidies may have long-term consequences on their labor market outcomes [Ham and Lalonde 1996, Bell *et al.* 1999]. Some of the key motivations for giving micro-entrepreneurs wage subsidies in developing countries are that they may be uncertain about their own abilities to hire workers, uncertain whether they face enough demand to support an additional employee, or simply too credit constrained to invest in an additional employee. If any of the previous conditions hold, micro-entrepreneurs may decide not to hire an additional worker even if the marginal return from hiring would be positive.

Galasso *et al.* [2004] evaluate the *Proempleo Experiment* in Argentina, a programme designed to assist the transition from workfare to regular work for individuals. The target population in this case were men and women enrolled in workfare programmes. Program participants were randomly allocated to three groups: one group was given a voucher entitling any private sector employer to a wage subsidy; a second group was given the voucher and the offer to participate to a vocational training program. The third group was used as control. Being assigned the wage subsidy voucher had a positive impact on employment probability but not on income. However, take-up of the wage subsidy by firms was very low. A possible explanation for the low take-up is that by programme design firms had to register the new worker in order to be granted the subsidy. While the value of the subsidy exceeded the registration costs, the subsidy only lasted 18 months and so employers would have incurred substantial costs in order to retain the registered employee in the longer run. In addition, many potential employers were operating informally, so could not register any worker at all. Still, some entrepreneurs decided to employ the workers with the voucher. The authors

interpretation of this finding is that either the voucher itself was interpreted as a positive signal of employee quality by employers, or it gave stronger motivation to workers to look for a job. The extra-impact of training over the wage subsidy were found to be very small.

de Mel *et al.* [2010] present evidence on the impacts of wage subsidies to micro-entrepreneurs using randomized experiment bases on Sri Lanka. Treated SMEs were offered a wage subsidy to employ a new worker. The wage subsidy was offered to 803 firms with less than two paid employees at baseline. The subsidy was fixed in monetary value and so did not vary across firms or regions, corresponding to approximately 50% of the average low-skill wage in the study area. The subsidy was offered for 6 months and phased out in months 7 and 8. They find that 22% of the firms offered the subsidy actually employed a new worker. Take-up was lower in Colombo, reflecting the fact that wages are higher in the capital city. There is some evidence that take-up was higher among larger SMEs with more asset-rich to begin with, and that more skilled entrepreneurs were more likely to take-up the subsidy. Interestingly, the recruitment of the new workers occurred mainly through social connections, rather than the placement of job advertisements or other intermediaries in the labor market. The authors find tremendous variation in the wage paid to the new workers. In fact, as the subsidy was independent of the wage paid to the new employee, a quarter of the firms taking-up the subsidy effectively employed the new worker at zero cost. 86% of the entrepreneurs expect to continue to employ the worker after the subsidy was removed and the median firm expected to increase sales by 25% as a result of hiring the employee. This study shows that a short-run wage subsidy could have long-run impacts on firm growth. However, a puzzle raised by the results of this study is why only 22% of firms employed a new worker, especially when most of them could have done so at zero effective cost. Two possible explanations are: (i) there may be important information problems in local labour markets that a wage subsidy may not be able to overcome (as reflected in the use of social connections for new hires); (ii) there may be a lack of skilled workers in the local labour market.

Asymmetric information appears to be a fundamental feature of labor markets: firms and workers both have private information at the time they meet. This can lead to inefficient recruitment and a misallocation of workers to firms. In turn, such mismatches can have self-enforcing effects on worker's *ex ante* incentives to invest in skills or search behaviors. To provide some evidence on the potential for information asymmetries to play a role in low-income labor markets, we return to our ongoing study in Uganda where firms were surveyed about their hiring practices. Figure 10 provides evidence on their recruitment channels: we see the majority of workers are hired through individuals approaching the firm (who are unknown to the firm beforehand). Middle men and job advertisements play a negligible role in hiring in this sample. Figure 11 then shows a box and whisker plot of the perceived importance firm owners have over various informational constraints related to worker hires. The standout concerns relate to information over the trustworthiness of workers, and their soft skills: such constraints are reported to be as important as those related to access to credit. Figure 12 complements this with a report of the kinds of information that firm

owners report wishing to have on employees at the point of recruitment: trustworthiness is the top characteristic, although other aspects such as an individual's creativity, communication skills and willingness to help others all feature highly. Table 1 shows that there is a low correlation in such skills among workers we have interviewed in Ugandan labor markets, so that the same underlying trait is not simply being picked up in multiple different ways (indeed, a number of the correlations are close to zero or even negative).

Other papers have studied matching and job placement in the labor market. For example, Hardy and McCasland [2015] use a field experiment that randomly placed unemployed young individuals as apprentices with SMEs in Ghana. The intervention both reduced search costs for firms and workers, but also allowed firms to better screen workers as workers participation required them to incur non-monetary costs. They find firms that were offered apprentices, hired and retained them for at least six months, and apprentices are associated with monthly increases of around 7-10% increases in firm revenues and profits relative to the baseline. The findings suggest the presence of economically significant search costs in this context. Franklin [2015] presents evidence from a RCT that randomly assigned transport subsidies to unemployed youth in Addis Ababa. He finds that lowering transport costs increases the intensity of job search, and increases the likelihood of finding good employment in the short run. Treated respondents also reallocate time away from labour supply in temporary work, towards search activities. Abebe *et al.* [2016] present further evidence from the same setting that experimentally reducing job search costs (either by giving them a transport subsidy or by certifying their skills and teaching them how to make effective job applications). They find that both treatments significantly improve the quality of jobs obtained, and that the impacts are concentrated among women and the least educated.

We return to the issue in the next Section when discussing workers non-cognitive skills: if there are returns to them in low-income labor markets, and whether such skills are observable by potential hiring firms.

2.4.3 Entrepreneurial Skills

On the provision of entrepreneurial skills, there is generally a view emerging that such programs have had disappointing impacts on firm performance. This is the case for most stand-alone short-term training programs targeted to existing micro-entrepreneurs. A meta analysis of such interventions in McKenzie and Woodruff [2013] finds little impact of entrepreneurial training programs in SMEs [Field *et al.* 2010, Karlan and Valdivia 2010, Drexler *et al.* 2014, Fairlie *et al.* 2015, Bruhn *et al.* 2016]. One exception to this is the study by Calderon *et al.* [2013] based on micro-enterprises in rural Mexico, who report that the key channel through which such entrepreneurial programs impact firm outcomes is through an altered product mix.

A separate strand of literature has studied the complementarity between capital and entrepreneurial skills. Recent evaluations of business training programs for aspiring entrepreneurs with

and without capital grants provide evidence of such complementarity [McKenzie and Woodruff 2012]. This is consistent with the fact that many evaluations of microfinance alone suggest it does not help create new businesses [Karlan and Zinman 2011, Kaboski and Townsend 2011, Banerjee *et al.* 2015, Crepon *et al.* 2015] and with the disappointing performance of most stand-alone short-term training programs for existing micro-entrepreneurs as described above.

Beaman *et al.* [2014] examine a specific form of constraint related to the human capital of firm owners: the limited attention of entrepreneurs towards their business. The authors focus on a particular business decision – how much change to keep on the business premises to break large bills and ensure business transactions can occur. The authors study a sample of 508 micro-enterprises operating in markets in Kenya. Lack of change seems to be a common problem for these firms: at baseline the average firm loses 5-8% of profits due to lack of appropriate change. The authors carry out two interventions using a randomized experiment. The first is a 'reminder' intervention: firms are visited weekly and asked questions on whether and how often they ran out of change in the past week and the value of sales lost as a result. Asking these questions was designed to make salient to entrepreneurs the problem of lack of change. Firms taking part in the study started receiving visits at different points in time, and this is used to identify the effect of such reminders. A second intervention was an 'information' intervention. A random set of firms, after a few visits, were also told how much profit they had lost due to the lack of change. Comparing firms that received the information intervention to firms that did not receive the intervention (holding constant the total number of visits) reveals the impact of the information intervention. The authors find the reminder intervention significantly reduced the number of times firms run out of change by 12%, while the information intervention by 20%. Profits increased by 12% in the information intervention (the effect of the reminder intervention was not statistically significant).

While training programs targeting micro-entrepreneurs have met with limited success, there is increased recognition that management practices in firms can account for a large share of cross-country productivity differences [Bloom and Van Reenen 2007, McKenzie and Woodruff 2015]. Indeed, experimental impacts of managerial capital have been found for larger firms [Bloom *et al.* 2013]. Contrary to the prevalence of institutional constraints highlighted in Figure 6, the quality of management practices do exhibit a correlation with GDP per capita. Bruhn *et al.* [2016] present evidence from a randomized control trial with 432 SMEs in Mexico, showing that access to management consulting had positive effects on total factor productivity and return-on-assets. They find permanent increases in the number of employees and total wage bill five years post-intervention. While they document heterogeneity in the specific managerial practices that improved as a result of the consulting, the three most prominent areas were marketing, financial accounting, and long-term business planning. Following on from the results reported in Calderon *et al.* [2013] as described above, improving managerial capital in SMEs is certainly worth studying further in future work. However, such interventions seem to have different impacts across contexts so more needs to be done to understand what drives these differences: for example, Karlan *et*

al. [2015] conducted a randomized control trial in urban Ghana in which 160 tailoring micro-enterprises received consulting advice, cash, both, or neither. They find that no treatment led to higher profits on average and that in the long run, micro-entrepreneurs reverted back to their prior business practices.

2.4.4 Asset Transfers

We have focused the discussion on entrepreneurs operating in the manufacturing or service sectors. However, in many low-income countries, the majority of the labor force remains engaged in agricultural work. Subsistence entrepreneurship, namely, livelihoods based around livestock businesses in the rural sector, remain of fundamental importance in driving income growth. Such activities are not well documented in cross-country data sets such as the WBES data. However, a recent body of evidence has emerged to understand whether subsistence entrepreneurship can be kick-started among ultra-poor households, many of whom typically do not qualify for microfinance programs due to their lack of assets [Banerjee *et al.* 2015, Bandiera *et al.* 2016]. This evidence base suggests programmes targeting the very poorest households with: (i) high valued asset transfers in the form of livestock, coupled with, (ii) complementary training in using livestock as productive assets, are effective in kick-starting these households' engagement into basic entrepreneurship. In turn, this leads to such ultra-poor households becoming less reliant on more volatile income streams earned from participation in agricultural spot labour markets. In contrast, forms of basic entrepreneurship based around the sale of livestock produce and animal rearing leads to sustained increases labour productivity, average incomes and reduced income volatility, allowing consumption to be smoothed over time, and asset accumulation to be undertaken. Overall, these interventions are found to be cost effective with internal rates of return of between 10 and 20 percent across contexts.

Table 2 summarizes the impacts found in such studies, where three year impacts are reported: these provide a relatively consistent picture of the types of effects that such asset-skills transfer programs have on subsistence entrepreneurship, across a range of economic and social outcomes. Bandiera *et al.* [2016] use a partial population experiment to also document the general equilibrium and distributional impacts of such large scale asset-skills transfer programs on village economies. Banerjee *et al.* [2016] and Bandiera *et al.* [2016] provide evidence on the long run impacts of such programs, some seven years after the injection of capital and skills is first provided. This shows sustained improvements in household outcomes, suggestive of the fact that such programs place households on a sustained trajectory out of poverty.[10]

There remain issues to be researched related to the optimal design of such asset-skill transfer programs: (i) what is the optimal package of transfers to make, in other words, what is the relative importance of constraints related to capital and those related to labour productivity?; (ii) how

[10]Murdoch *et al.* [2015] evaluate a similar program in India but find little impact: the explanation is that in that context households have good outside options in wage labor through the NREGA program, rather than taking up subsistence entrepreneurship through livestock rearing.

heterogeneous are the impacts of asset transfer programs across households, and given that such programs are costly, what does this heterogeneity of impact imply about the optimal targeting of such asset transfer programs?; (iii) as with the literature described earlier on capital injections to firms, a remaining set of issues to explore in future research relates to comparing the impacts of such asset transfer programs with offering the poorest households the equivalent unconditional cash transfer. Understanding from the policymakers perspective the choice between in-kind asset transfers and training versus the provision of equivalent valued unconditional cash transfers gets to the heart of the design of social protection policies. Studying this comparison in the same setting and understanding how households choose to invest cash, sheds light on the existence and nature of market constraints that cause capital and labour constraints to bind in the first place.

3 Workers

Raising the human capital of individuals and aiding them to become productive members of the labor force are key issues all policy makers in low-income countries face. The demographics of much of the developing world make the transitions between schooling and the labor force an especially important time to focus on. One billion people on the planet are aged between 15 and 24 and reside in a developing country, an increase of 17% since 1995, and there are great demands on policy makers to consider responses to this 'youth bulge' [World Bank 2007, 2009]. The central policy challenge is to provide skills and job opportunities to increasing numbers of young people. This phenomenon is most pronounced in Sub-Saharan Africa, where 60% of the population is aged below 25 [World Bank 2009]. Youths face severe economic challenges, as they account for most of the region's poor and unemployed: in sub-Saharan Africa, 60% of the total unemployed are aged 15-24, and on average 72% of the youth population live on less than $2 per day.

We consider two branches of literature studying workers in low-income labor markets. These relate to the provision of vocational and on-the-job training (i.e. apprenticeships), the returns to and provision of non-cognitive skills.

3.1 Training

The WBES allows us to explore issues related to training provision in formal sector firms. Figure 13 shows the percentage of firms reporting to provide training to their workers, by country (ranked by GEP per capita in 2006). We see that a large percentage of firms provide training, and this is nearly always higher in larger firms. There are two primary competing models of firm investment in training. Becker's [1962] seminal work argues that firms operating in perfect markets always have an incentive to invest in firm-specific training, that is, in those skills that are useful only with the current firm. However, firms never have an incentive to invest in general training, that is, in such skills that are useful also in other firms: in perfect markets workers are paid their marginal product

and thus they appropriate all the returns from general training. Thus, all observed firm-sponsored training should be in firm-specific skills.

Acemoglu and Pischke [1999] instead show that when the labor market is characterized by a compressed wage structure, that is, when frictions in the labour market imply firms make higher profits from more skilled workers, firms have incentives to also invest in general training. Labour market frictions, such as unemployment, asymmetric information or high search costs, reduce the outside option for skilled workers relatively more than for unskilled workers. This creates a distortion in the wage structure. In consequence, firms are able to appropriate some of the returns from general training, and so find it profitable to invest in the general skills of their employees. Two immediate comparative static results of this theory are that we should observe more on-the-job training and higher tenure effects in labour markets with a more compressed wage structure. Hence in countries with more compressed wage structure, on-the-job training is an even more important source of human capital accumulation and skill creation.

There is a substantive empirical literature on why firms invest in the general skills of workers in Europe and the US. Most of these studies indeed suggest that informational asymmetries on the skills of workers justify firm-sponsored general training [Acemoglu and Pischke 1998, 1999, Autor 2001]. While evaluations of labour market training programs in industrialized countries generally produce mixed results [Card *et al.* 2010, 2015], such programmes may have larger impacts in middle- and low- income countries, where the returns to skills are higher and where the skill-level of the population is lower to begin with. On the consequences of training, the academic literature has evaluated several large scale labour market programmes in Latin America. Attanasio *et al.* [2011] and Card *et al.* [2011] are the two most prominent examples.

Attanasio *et al.* [2011] study the impact of a randomized training programme on the employment outcomes of disadvantaged youth in Colombia. The program studied, *Jovenes en Accion*, was introduced between 2001 and 2005 and provided subsidized training to poor unemployed young (18-25) people belonging to the lowest socioeconomic strata of the population and residing in urban areas. Training consisted of three months of in-classroom training and three months of on-the-job training (i.e. an apprenticeship). On-the-job training was provided in the form of unpaid internships at legally registered firms. The program cost US$750 per recipient, operating in the seven largest cities of Colombia. Training was delivered in a number of occupational sectors chosen by the training institutions to meet labor market demand. Training institutions were asked to select a number of applicants greater than they could accommodate. An oversubscription design was then utilized so that applicants were randomly selected into a treatment group and a control group. The study uses a sample of 2040 and 2310 individuals in the treatment and control groups respectively. Two survey waves were conducted: a baseline in 2005 and a follow-up between August and October 2006. The issue of non-random attrition is documented to be a slight concern for men. The authors estimate the ITT impact of the offer of training. As the compliance rate is 97%, the identified effect is close to an average treatment effect for those volunteering for the

program. They find that for women, employment increases significantly by 6.1 percentage points and paid employment increases by 7.1 percentage points. This is mirrored by a significant increase in the days per month and hours per week. Salary earnings increase by 22% of control women's earnings. Instead, they find no significant effects for men, except a higher probability of working in the formal sector. Overall, the program appears to have had strong effects for women.

Attanasio *et al.* [2015] goes on to use administrative records to trace through the longer term impacts of the same intervention. They find that a decade later, the program had a positive and significant effect on the probability to work in the formal sector. Treated applicants contributed more months to social security, and were more likely to work for a large firm. Earnings of treated applicants were 12% higher. Finally, they report the benefits of the program are higher than its costs, leading to an internal rate of return of at least 22 percent. This compares favorably with other development policy interventions.

Card *et al.* [2011] evaluate a similar training programme for disadvantaged youth in the Dominican Republic. The program studied, *Juventud y Empleo*, provided three months of in-class training and two months of on-the-job training to low income youth with less than a high-school diploma, currently not working or attending school. The data come from a baseline survey and a follow-up. The authors find no impact of the training programme on the likelihood of being employed at follow-up. They instead find a 10% effect on earnings. The programme has no effect on hours but a 7%-10% effect on wages.

Evidence on training programs outside of Latin America remain scarce but are beginning to emerge. Hicks *et al.* [2011] present preliminary evidence of the impact of the *Technical and Vocational Vouchers Program*, a vocational training voucher and information programme for disadvantaged youth in Kenya. 526 applicants were randomly assigned unrestricted vouchers (to be spent in either private or public vocational training centres); 529 were randomly assigned vouchers for public training centres; 1108 youth served as control group. A random sample of applicants was also given detailed information about the returns from training: applicants were told about the large gaps in the typical earnings in male-dominated occupations such as motor-mechanics relative to female dominated occupations such as tailoring. The early results of the intervention are: (i) 74% of the individuals offered a voucher enrolled into a VTP: the main reasons for not enrolling were costs related to transportation or room and board, or factors related to maternity and childcare; (ii) at baseline applicants had optimistic expected returns from training: they believed the average returns to be 61% compared to an estimated Mincerian return of 37%. Also, they had imprecise information about the highest earning trades. The information intervention had an impact on the choice of women to enrol for men-dominated occupations.

Alfonsi *et al.* [2016] evaluate the two commonest forms of training against each other: vocational training and on-the-job training, in a representative sample of urban labor markets in Uganda. Their core contribution to separate out the returns to each element of training: (i) the type of training workers receive; (ii) the fact that workers are matched to firms and so increase

their labor market experience *per se*. The experimental design assigns workers to two treatment groups: (T1) those offered placement of on-the-job training with interested firms; (T2) those offered the provision of six months of sector-specific vocational skills training. Comparing T1 and T2 reveals the differential returns of the two most common forms of training programme utilized in developed and developing countries (on-the-job training vs vocational training). The randomization exploits an oversubscription design, where individuals initially apply for the vocational training programme. The evaluation is then based on tracking over 1700 workers from baseline through follow-up surveys after 24 and 36 months. The firms that workers are matched to in T3 and T4 are from a nationally representative sample of SMEs operating in the same sectors in which training was provided/sought on application.

The reduced form impacts comparing on-the-job and vocational training show that: (i) both forms of training have significant impacts on the extensive margin of finding wage employment (by around 25% relative to the control group); (ii) both treatments have significant impacts on hours workers, hourly wages and total earnings (by at least 30%). These results are shown to be robust to allowing for selective attrition using Lee bound estimates. Following Attanasio *et al.* [2011] they split the total earnings impacts into those arising from a change in composition of employed workers (extensive margin impacts), and those arising from pure productivity impacts. Their bounds estimates of the productivity impacts suggest both forms of training have positive productivity impacts, with vocational training having the larger impact on worker productivity. They verify the impacts on hourly earnings and productivity bounds by implementing a practical skills test to workers in all treatment groups: in line with the earlier evidence, this shows vocational training to significantly raise practical skills, both relative to the control group and relative to the workers that were assigned to on-the-job training. The final part of their analysis estimates a structural model of worker job search, where workers make two endogenous choices: (i) how much search effort to exert; (ii) their reservation wage. Using monthly data on labor market histories for workers, we use the experiment to identify the structural model and shed light on how training impacts these two endogenous outcomes through two mechanisms: (i) worker beliefs over the arrival of job offers; (ii) the distribution of offered wages. They use these structural estimates to conduct counterfactual policy analysis, and to estimate the lifetime benefits of training and matching routes into the labor market, and so estimate the internal rate of return of each treatment to be around 22%.

The evidence on training in low-income settings is continuing to grow: we have little evidence outside Latin America, and it remains to be well understand why so few individual take-up such programmes despite their high returns or how policy can encourage the efficient supply of such programmes. In particular, it is important to establish how the suppliers of such training programmes, be they governments, NGOs or private entities, determine what skills to provide, the quality of provision, and to what extent workers are aware of the quality of training they receive.

3.2 Non-Cognitive and Life Skills

Evidence from the US and Europe suggests that both non-cognitive abilities (such as motivation, perseverance, trustworthiness and tenacity) and cognitive abilities (such as IQ) are important determinants of labour market outcomes [controlling for education, experience and other practical skills]. Many studies suggest that non-cognitive may be more important than cognitive abilities [Bowles and Gintis 2001, Heckman *et al.* 2001, Heckman *et al.* 2006], especially in low-skilled occupations [Linqvist and Vestman 2011] in which employers tend to value docility, dependability and persistency more than cognitive skills [Bowles and Gintis 2001]. This area remains under researched in low-income settings.

An insight into the issue is provided in Bassi and Nansamba [2016], who study information frictions on the soft-skills of workers during the hiring process in firms. They present results from a field experiment in which such skills of workers are revealed to potential employers at the time of hiring. they find that in the control group where no new information is revealed, firm owners of higher cognitive ability are more likely to hire workers with higher skills. High ability owners react to the information revelation treatment by increasing hires among matched workers with a lower level of the skills being signalled. On the contrary, firm owners of lower ability do not react to the new information. The intervention is shown to have persistent effects, and also impacts the outside options of workers, thus facilitating the reallocation of labor across jobs in the economy. Overall, the study highlights that there are positive returns to soft-skills in this low income labor market, and that such skills are difficult to observe for employers.

A body of work now exists studying life skills programs, that have typically been targeted to adolescent girls in low-income contexts. For adolescent girls, economic concerns on acquiring labour market skills are compounded by health related challenges such as early wedlock and pregnancy, exposure to STDs and HIV infection. These economic and health issues are obviously interlinked: teen pregnancy and early marriage are likely to have a decisive impact on the ability of young girls to accumulate human capital, and limit their future labour force participation [Field and Ambrus 2008]. At the same time, a lack of future labour market opportunities can reduce the incentives for young girls to invest in their human capital and raise labour productivity [Jensen 2012], leading to early marriage and childbearing, and potentially increasing their dependency on older men [Dupas 2011].[11] Economic empowerment and control over the body thus interact in a powerful way during adolescence. Hence, interventions targeted towards adolescent girls might have higher returns than later timed interventions [Heckman and Mosso 2014].

Many policy interventions targeted to youth focus on: HIV education and related issue to reduce risky behaviors, or, vocational training to improve labor market outcomes. There are relatively weak impacts of single pronged interventions [Gallant and Maticka-Tyndale 2004, McCoy

[11] Baird *et al.* [2011] document that marriage and schooling are mutually exclusive activities in Malawi, and Ozier [2011] provide similar evidence from Kenya. In Bangladesh, Field and Ambrus [2008] show that each additional year that marriage is delayed is associated with .3 additional years of schooling and 6.5% higher literacy rates.

et al. 2010, Duflo *et al.* 2011], and so an emerging literature has focused attention on multi-pronged interventions.

One example is Bandiera *et al.* [2015] who evaluate an intervention attempting to jump-start adolescent women's empowerment in Uganda. The intervention relaxes the human capital constraints that adolescent girls face by simultaneously providing them vocational training and information on sex, reproduction and marriage. Relative to adolescents in control communities, after two years the intervention raises the likelihood that girls engage in income generating activities by 72% (driven by increased self-employment), and raises their expenditure on private consumption goods by 38%. Teen pregnancy falls by 26%, and early entry into marriage/cohabitation falls by 58%. Strikingly, the share of girls reporting sex against their will drops from 14% to almost half that level and aspired ages at marriage and childbearing both move forward. The findings suggest women's economic and social empowerment can be jump-started through the combined provision of hard and soft skills, in the form of vocational and life skills, and is not necessarily held back by binding constraints arising from social norms or low aspirations.

Duflo *et al.* [2014] study the coupling of soft-skill transfers with financial incentives. They evaluate a school-based HIV prevention program in Kenya coupled with subsidies to attend school, and present evidence highlighting the joint determination of schooling and pregnancy outcomes for adolescent girls. This shows the efficacy of providing adolescent girls information on how to reduce their exposure to pregnancy risks, is larger when reinforced by program components that *simultaneously* empower girls to lead economically independent lives.[12]

Finally, Blattman *et al.* [2015] report evidence from a RCT targeted towards criminally-engaged men in Liberia, randomizing half to eight weeks of cognitive behavioral therapy designed to foster self-regulation, patience, and a noncriminal identity. They also randomized participants into receiving $200 cash grants. They find that cash transfers alone and CBT alone initially reduced crime and violence, but effects dissipate over time. However, when cash followed therapy, crime and violence decreased dramatically for at least a year. They hypothesize that cash reinforced therapy's impacts by prolonging learning-by-doing, lifestyle changes, and enabling individual to engage in self-investment. The study is important for highlighting links between non-cognitive skills and resources.

Just as with understanding constraints on firms, there is an open agenda on understanding the interlinkages of constraints individuals face in making investments in their human capital, that can help them successfully transition into the labor market. Understanding these complementarities or substitutabilities is needed to feed into the design of more cost-effective policies.

[12]Relatedly, Baird *et al.* [2011] evaluate an intervention using only using financial incentives. They find a cash transfer of $10 per month conditional on school attendance for adolescent girls in Malawi led to significant declines in early marriage, teenage pregnancy and self-reported sexual activity after a year. Baird *et al.* [2014] also report beneficial impacts on the economic and social empowerment of adolescent girls in Malawi that have dropped out of formal schooling from a cash transfer conditioned on school attendance.

4 Labor Markets

We now study market wide issues, that enables us to link back to the kinds of institutional constraint highlighted as relevant drags on firm expansion in the WBES data.

4.1 (In)Formality

A large share of SMEs in low-income countries are informal, and as documented in Freeman [2009], the informal sector increased its share of the work force in the developing world in the past two decades. While informal firms tend to be small and unproductive, in aggregate they represent a substantial share of economic activity, nearly one-third on average across low-income countries and in some, such as Tanzania, Zambia, Myanmar, well over half [Schneider *et al.* 2010]. This has two important consequences. First, informality deprives the government of tax revenues and weakens the provision of public services. Second, informality can allow persistent dispersion in marginal production costs, leading to an inefficient allocation of resources and hindering economic growth [La Porta and Shleifer 2008].

The WBES covers only firms that are formally registered. However, these data still allow us to explore some features of the informal sector. Firms are asked if they registered when they started business or after some time and whether they have informal competitors. As Figures 14 and 15 show, this data suggests the majority of formally registered firms started out that way or registered soon after operations commenced.

Only a handful of countries make a concerted effort to identify and survey informal firms. Mexico's Economic Census (CE) is one such example. Comparing this data with the distribution of firms in WBES sample for Mexico provides some indication of the gaps. Small firms, those with ten or fewer employees, are substantially more prevalent in the CE, representing over 90% of firms in manufacturing, retail and services in contrast to roughly 40% in the weighted WBES data for the same sectors. This is no surprise – the WBES targets registered firms with five or more employees. Busso *et al.* [2012] draw three conclusions from the Mexican data. First, informality and illegality are not equivalent. It is possible for both firms and workers to be informal and legal. This is because the Mexican labour regulation requires firms to register their salaried workers: those that are paid a fixed amount of money per unit of time. Non-salaried workers, paid in form of a piece-rate or anyway irrespective of the amount of time they work, don't have to be registered. Therefore, if a firm only employs non-salaried workers and doesn't register any of them is considered formal and legal. Second, while informality is certainly correlated with size, it is not equivalent. There are many small and formal firms as well as large and informal firms. Third, informal firms do not necessarily perform poorly. Many are actually highly productive.

There is a body of empirical evidence studying aspects of entrepreneur's decisions to formally register their businesses. De Soto's [1989] work has had a profound effect on how policymakers

think about formalization, arguing that burdensome regulation prevents small firms from formalizing. Partly in response to these arguments, nearly three-quarters of the countries included in the World Bank and IFC's Doing Business surveys have adopted at least one reform designed to facilitate business registration.

Much of the work in this area has been done in Mexico, which has both high-quality data on informal firms via its Economics Census and has enacted significant reforms to the formalization process, including reducing the time to register a firm in some sectors from 30 to 2 days at the municipal level. These reforms induced modest increases in formalization (the fraction of registered businesses increased by 5%) but the mechanism through which even these small changes were affected remains uncertain. Bruhn [2011] finds that any increases appear to be due to new entry rather than the formalization of existing firms, while Kaplan *et al.* [2011] use different data and find the opposite result. Fanjzylber *et al.* [2009] find that increased formality is associated with higher productivity in small firms.

The SIMPLES program in Brazil has also attracted significant study. This reform simplified the tax system for micro and small enterprises by combining six different taxes into one. It also reduced the overall tax burden and the red tape involved in the tax payment. Monteiro and Assunção [2012] provide evidence that the reform did affect registration behavior, showing an increase in formality for just those sectors affected by the reform. Fanjzylber *et al.* [2011] find that firms opening post-reform tend to be larger and more likely to have a permanent location. They interpret this finding as evidence that formalization improves performance, but as de Mel *et al.* [2013] point out, this could also result from selective firm entry.

A relatively new strand of the literature suggests that high levels of informality may stem from the modest ongoing benefits of formality rather than the high up-front cost of formalization. Emerging evidence from Sri Lanka and Peru suggests that while firms may overestimate the costs to formalization, the short-run gains are similarly muted [Alcázar *et al.* 2010; De Mel *et al.* 2012]. Maloney [2004] suggests that smaller and less productive firms may get little benefit from formalization, so that informality may be a rational calculation of costs and benefits. McKenzie and Sakho [2010] demonstrate significant heterogeneity in response to firm registration in Bolivia. Even if formalization may bring benefits to some small firms, perhaps these benefits are not universal. Jaramillo [2013] studies a registration subsidy for micro-enterprises in Lima, Peru. He finds that the limited growth aspirations of these firms combined with the recurring costs and low perceived benefits of formalization yield very low demand for formalization.

De Mel *et al.* [2013] provide compelling evidence that reducing formalization costs alone may have a limited impact on registrations and provide further support for the hypothesis that a lack of meaningful ongoing benefits may be the key obstacle to increasing formalization. Their study builds on a randomized experiment testing different incentives for formality in Sri Lanka. Providing information about the registration process and reimbursing all direct costs was not enough to get firms to register. Even with powerful monetary incentives, up to an additional two months of the

median profits for firms in their sample, only half of firms choose to register. Those that do report higher profits on average, but this result is driven by a few very successful firms.

Finally, a contrasting empirical approach is followed by Meghir *et al.* [2015] who develop and estimate an equilibrium wage-posting model with heterogeneous firms to explain the choice between formality and informality. Estimating the model on Brazilian labor force survey data they find that in equilibrium, firms of equal productivity locate in different sectors and wages are characterized by compensating differentials. They show that tightening enforcement on firm registration does not increase unemployment. However better enforcement does increases wages, output and welfare because it allows an improved allocation of workers to higher productivity jobs, and increases competition in the formal labor market.

4.2 Other Issues: Infrastructure and Unions

The state plays a leading role in the provision of infrastructure, and this can have dramatic impacts on labor markets, both by increasing interfirm linkages, connecting firms to markets, and by increasing the scope of search possibilities for workers. At the aggregate level, a large body of literature, starting with Aschauer [1989], has found a positive relation between infrastructure capital and TFP in the United States. Mitra *et al.* [2002] estimate this effect for Indian manufacturing sector. They find that infrastructure endowments explain a large part of TFP differences across Indian states. Within this literature, another strand has focused on specific components of infrastructure and their impact on economic outcomes. The role of energy is sufficiently important to merit its own focus. Using firm-level data, Reinikka and Svensson [1999] show that the lack of reliable power supply in Uganda reduces private investment productivity by forcing firms to invest in generators and other low-productivity substitutes for reliable public provision of power. Alcott *et al.* [2016] study the impact of power shortages on firms' productivity in India. They find that although power cuts are perceived as very damaging by entrepreneurs, the effect is small.

On the impact of transportation links on firms, Banerjee, Duflo, and Qian [2012] and Donaldson [2013] estimate the impact of railroads in China and India, respectively. The former find that in China, proximity to the transportation network had a small impact on the levels of GDP per capita but no effect on growth. In India, Donaldson [2016] finds railroads increased trade and income per capita. On the effects of other infrastructure on firms, Duflo and Pande [2007] find that irrigation dams in India increase agricultural productivity and reduce rural poverty in downstream districts, while having the opposite effect in the districts where dams are built.

Unions play an important role in determining outcomes in labor markets, yet are relatively understudied in the context of low-income countries. Freeman [2009] provides an excellent review of the literature on the impact of government regulations and union activity on labor outcomes, summarizing some of his findings as follows: (i) labor institutions vary greatly among developing countries, with unions and collective bargaining being less important in developing than in

advanced countries while government regulations are as important; (ii) many developing countries compliance with minimum wage regulations produce spikes in wage distributions around the minimum in covered sectors; (iii) minimum wages often go onto impact informal sector wages, producing spikes in the wage distributions there as well; (iv) employment protection regulations and related laws shift output and employment to informal sectors and reduce gross labor mobility; (v) mandated benefits increase labor costs and reduce employment modestly while the costs of others are shifted largely to labor; (vi) unions affect non-wage outcomes as well as wage outcomes.

Rios-Avila [2014] examines the impact of unions on productivity in the manufacturing sector across six Latin American countries. By estimating firm production functions using the WBES data, he finds that unions have positive, but mostly small, effects on productivity, but with some exceptions. In most cases, he finds the positive productivity effects barely offset higher union compensation, and that unions are negatively related to investment in capital and research and development. Given the heterogenous findings across countries, much still needs to be understood on the role of unions on firms, the distribution of wages, as well as the impacts on individual members.

5 Discussion

We now bring together the earlier discussion to reiterate research areas where the role of institutions in relation to firms, workers and labor markets is most in need of development.

On firms, an evidence base needs to be built across the entire firm size distribution, and to further open up the nature of institutional constraints faced by firms. For example, the functioning of land markets and firm performance, the link between infrastructure and firm TFP, and the impacts labor regulations and corrupt behavior of officials on firms, are all areas ripe for future study. We echo the appeal of Karlan and Fischer [2015] in suggesting the need to study the interplay between constraints rather than considering constraints on firms in isolation, and to have a more central focus on managerial practices in SMEs that seem to offer some promise as a cost-effective route by which to raise the productivity of small enterprises.[13]

Beyond constraints, many issues of the optimal targeting of policy remain: how do we identify firms with the highest growth potential, or channel resources towards those individuals with a comparative advantage in micro-entrepreneurship? The collective work on asset-skills transfers to the ultra-poor [Banerjee *et al.* 2015, Bandiera *et al.* 2016] and on cash transfers to disadvantaged youth [Blattman *et al.* 2016], suggests that even those that start with low levels of human capital can be come successful entrepreneurs.

[13] An example of such an approach is Fiala [2014] who reports results from a field experiment targeting micro-entrepreneurs in Uganda to receive loans, cash grants, business skills training, or a combination of these programs. The results suggest that male-owned micro-enterprises can grow through finance when paired with training, but that the impacts on female entrepreneurs are muted for each intervention.

On workers, a better understanding needs to be gleaned on the changing returns to cognitive and non-cognitive skills during the process of economic development. Much of this is being accelerated through trade linkages, that fosters the development of new sectors in low-income countries. As with firms, there are analogous counterparts to understanding what constrains workers from acquiring the skills relevant for the labor market, and the interplay between constraints. There are important supply side issues to consider, most obviously in terms of understanding the market for training providers: what drives their quality and can their incentives be designed to align their objectives with those of society?

On data and design issues, there are encouraging trends in the collection of both administrative data sets that allows worker outcomes to be tracked, and matched employer-employee data in low-income contexts. These can play an enormous role in advancing understanding of how worker-firm matches occur, and the dynamics of labor market transitions for workers. These new forms of data can also foster methodological advances. For example, they encourage the use of job search/worker-firm matching models, and this is best done through a combination of reduced form (experimental) and structural form modelling. Such structural job ladder models can be used to recover and explain wage distributions as potentially also used to understand consumption inequality. From a micro perspective, firm level studies need to try and build into their design the possibility of measuring spillover effects of firm level interventions on other firms (local competitors, or upstream/downstream supply chains), and to further study the longer term impacts of interventions.[14] All of this will be challenging but hugely insightful for policy.

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Figure 1: Firm Size and Employment Distributions, by Country

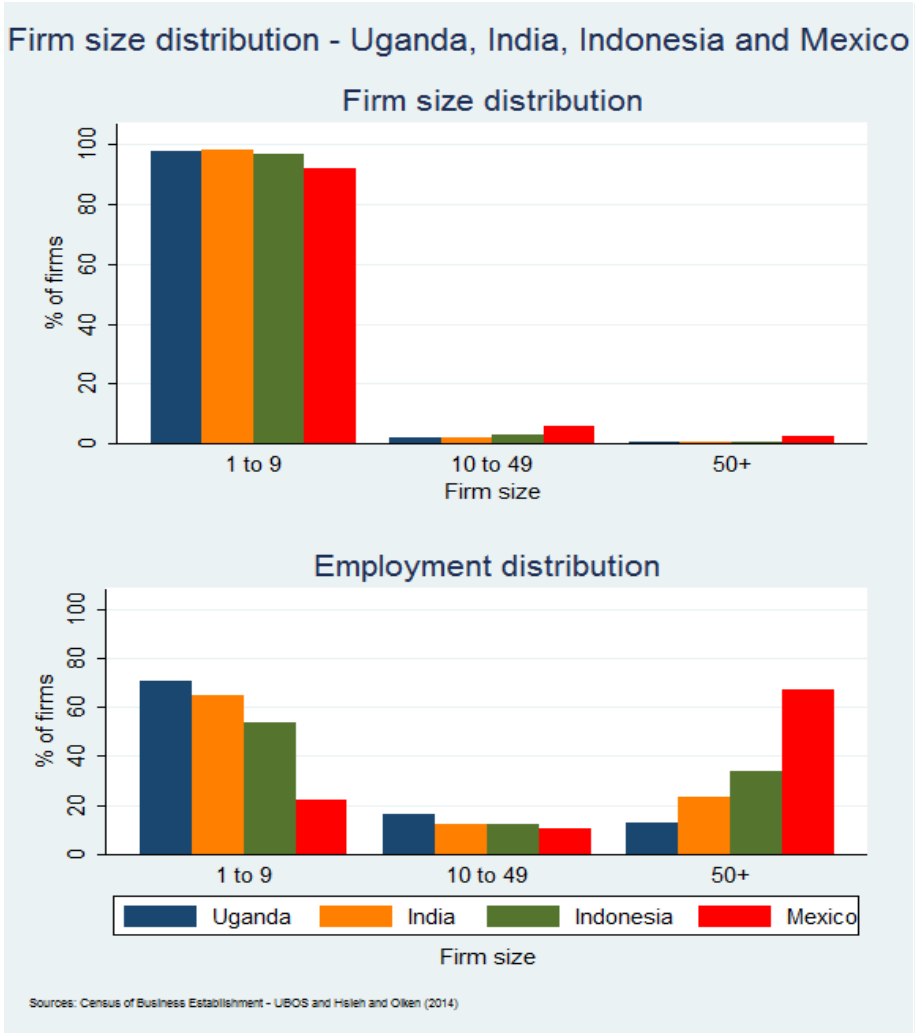
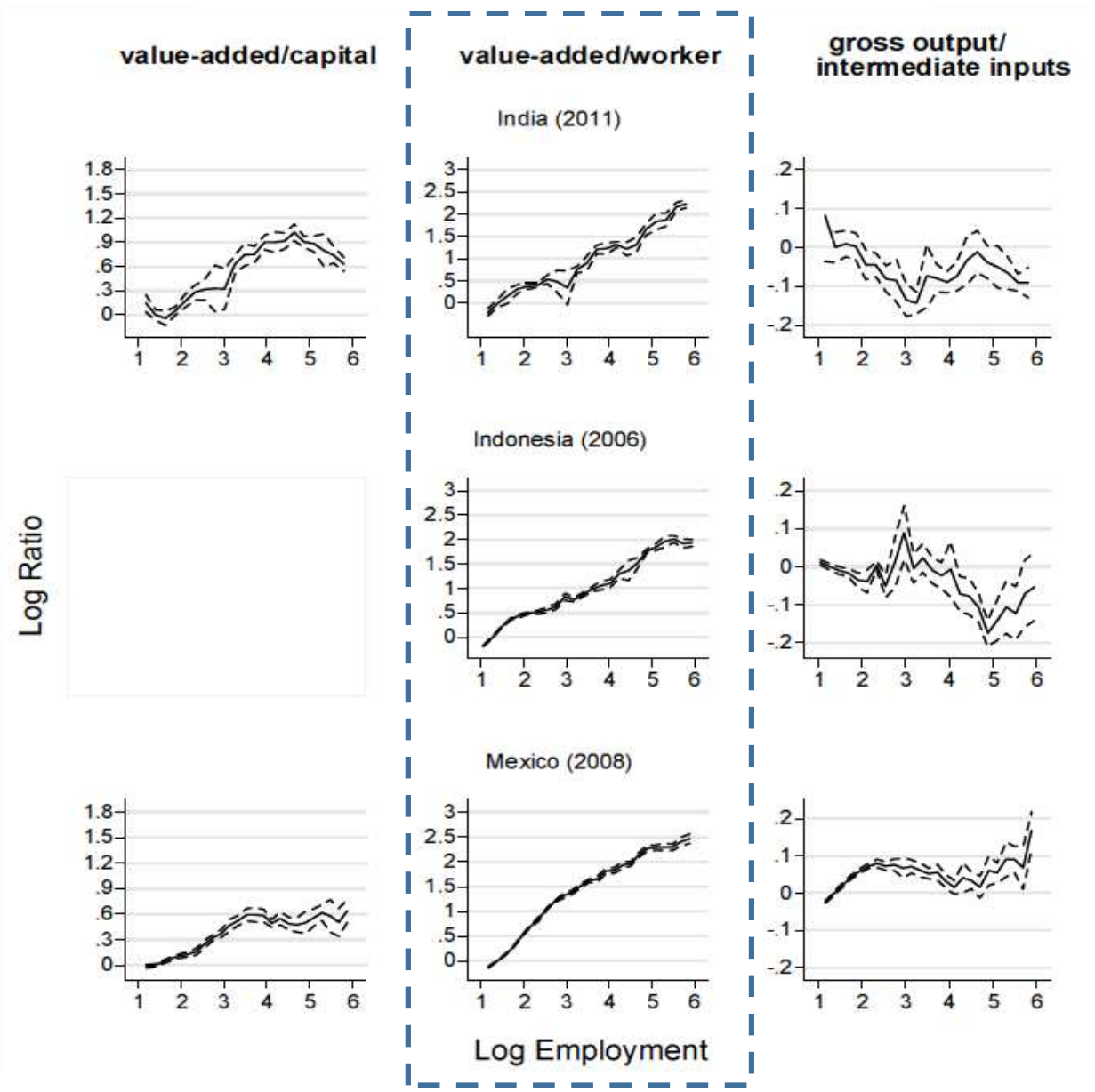


Figure 2: The Missing Missing Middle

Average Product and Firm Size



Source: Hseih and Olken [2014]

Figure 3: Firm Size Distribution in Some Cited Studies

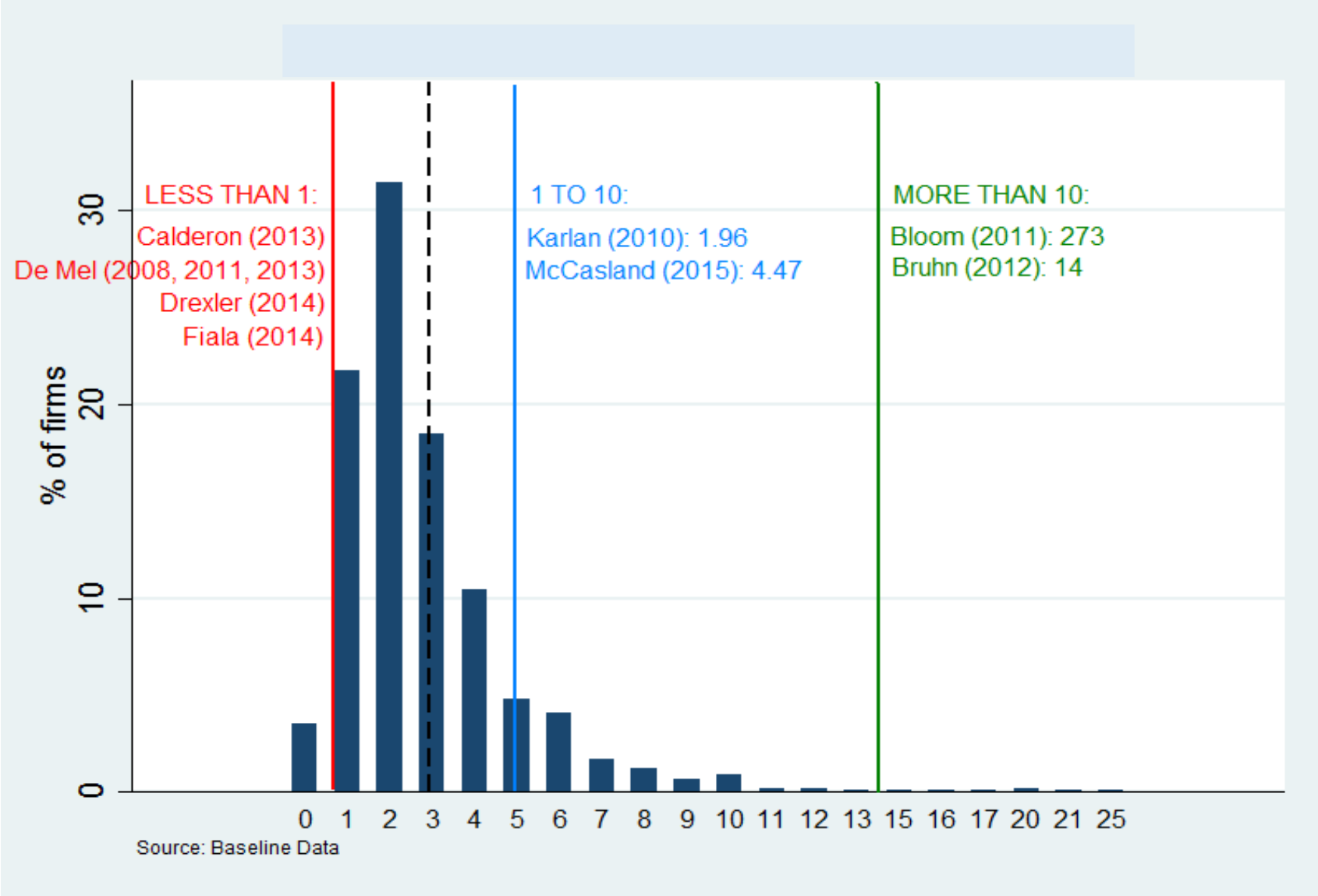
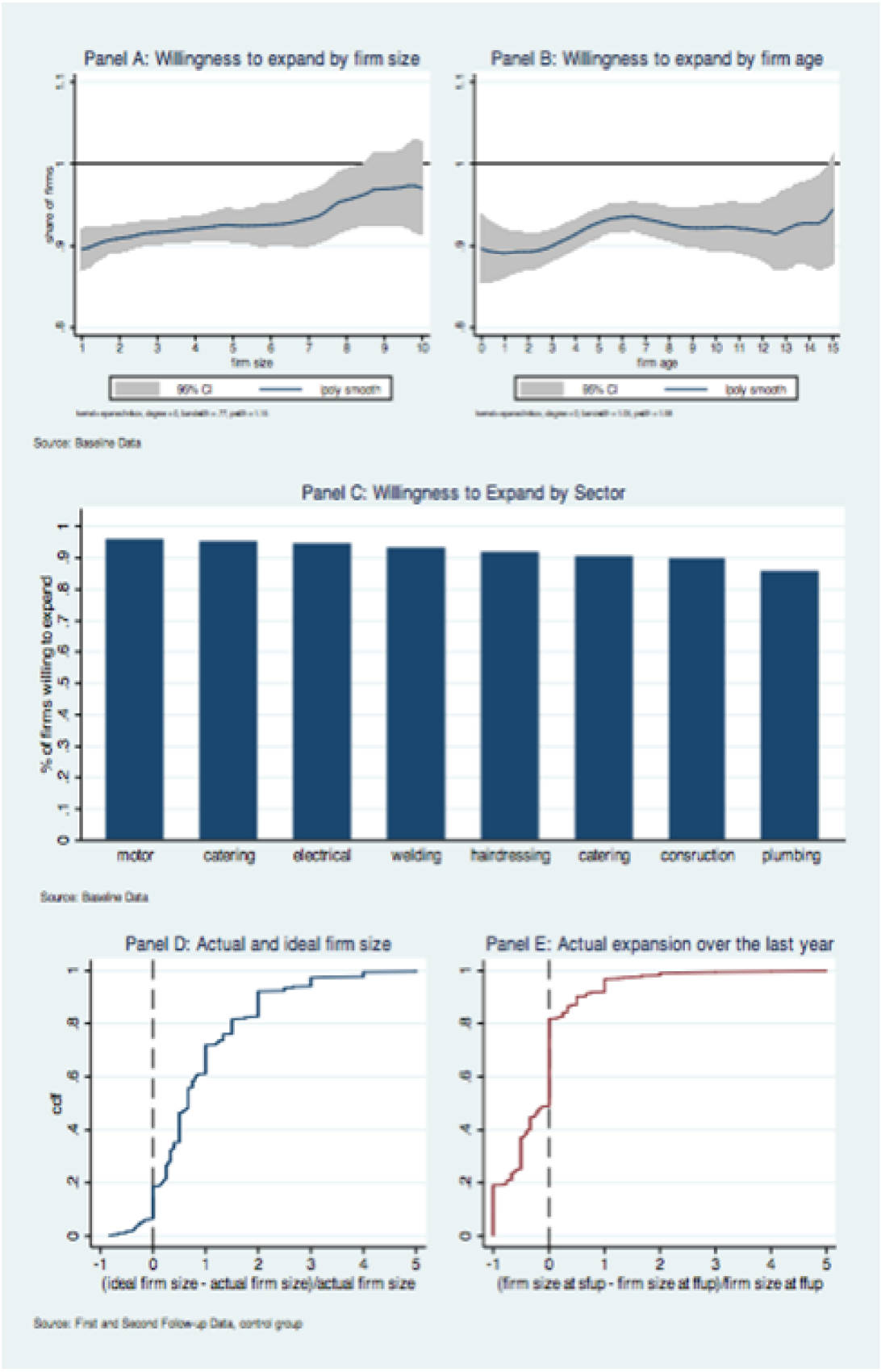


Figure 4: Firms Desired and Actual Expansion



Source: Authors own ongoing work with various co-authors

Figure 5A: Main Constraints for Small Firms (size 5-19)

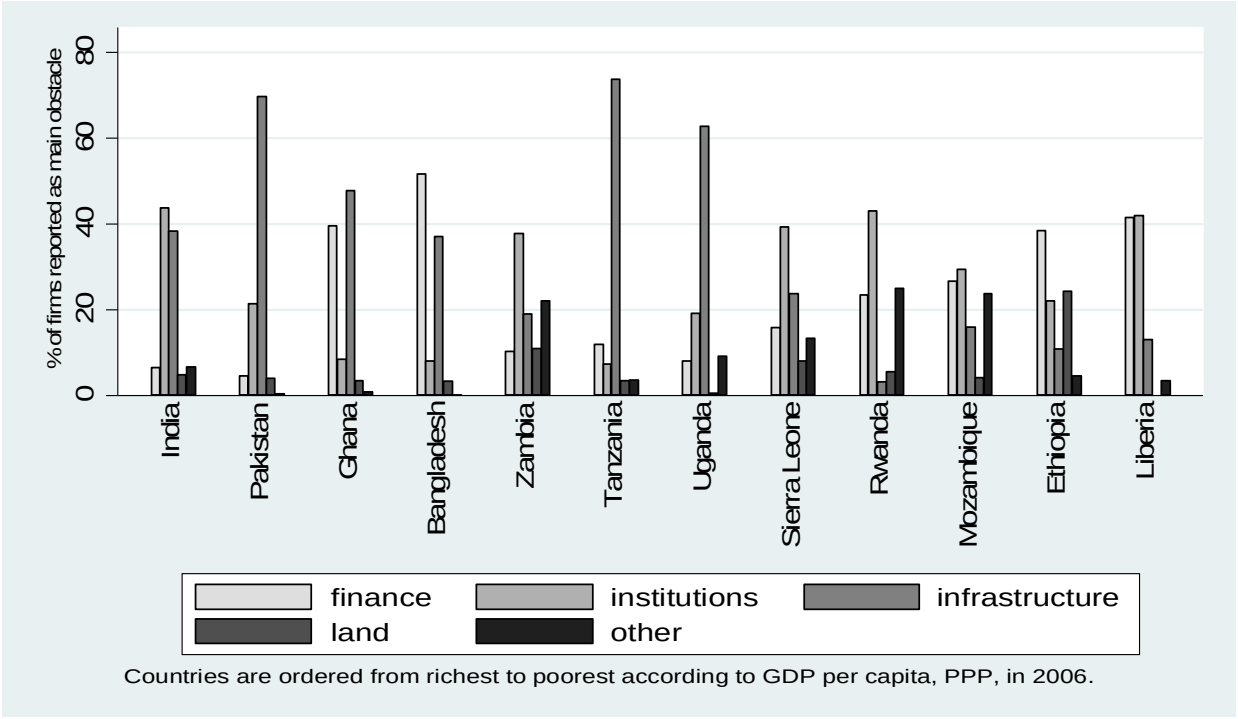
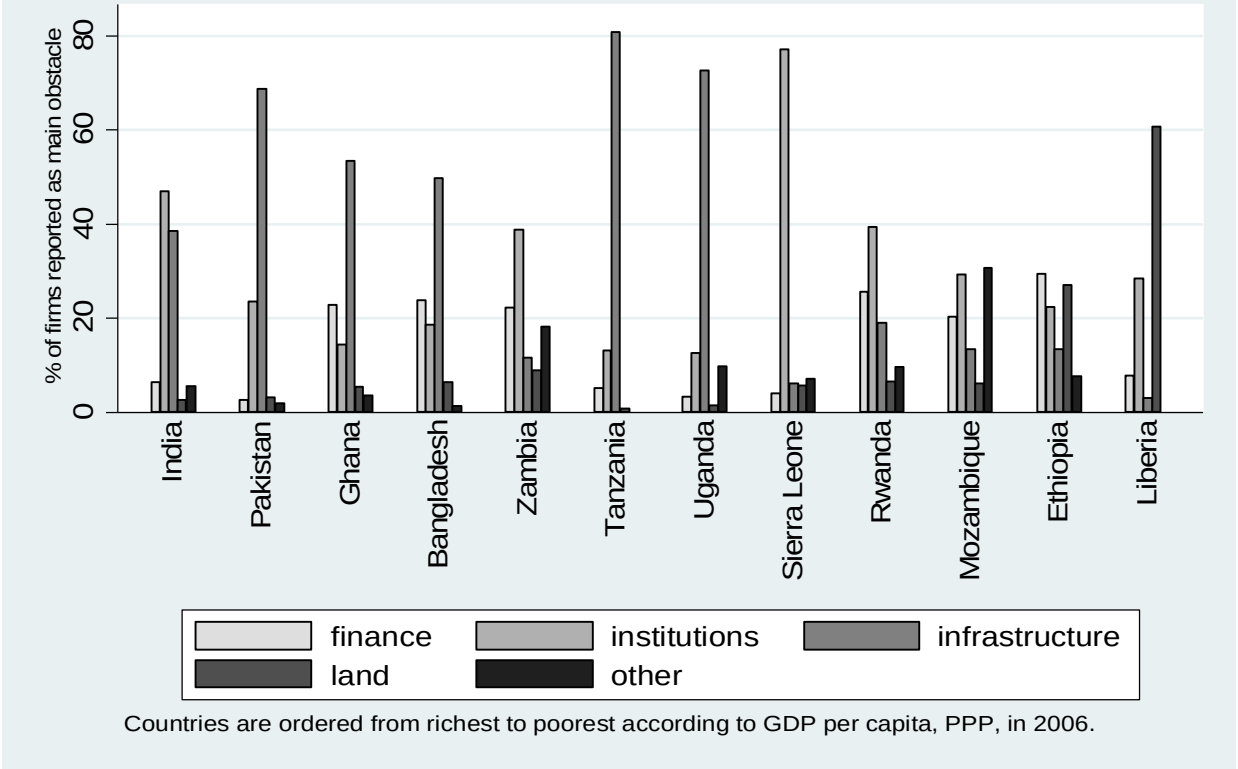
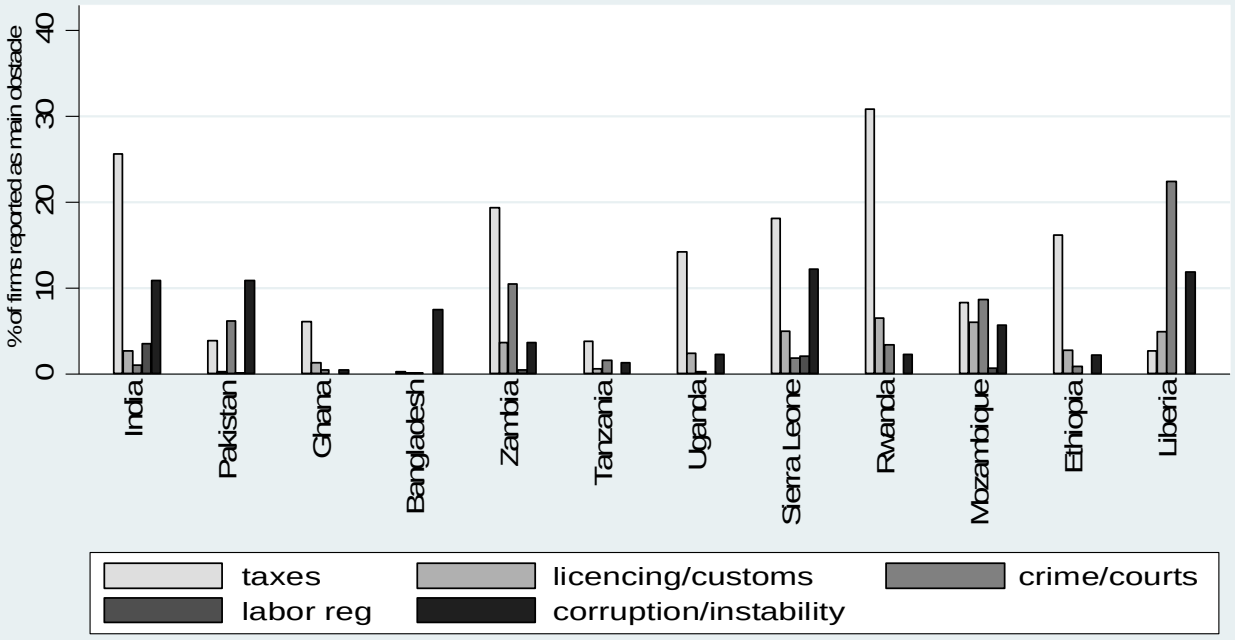


Figure 5B: Main Constraints for Medium Sized Firms (size 20-99)



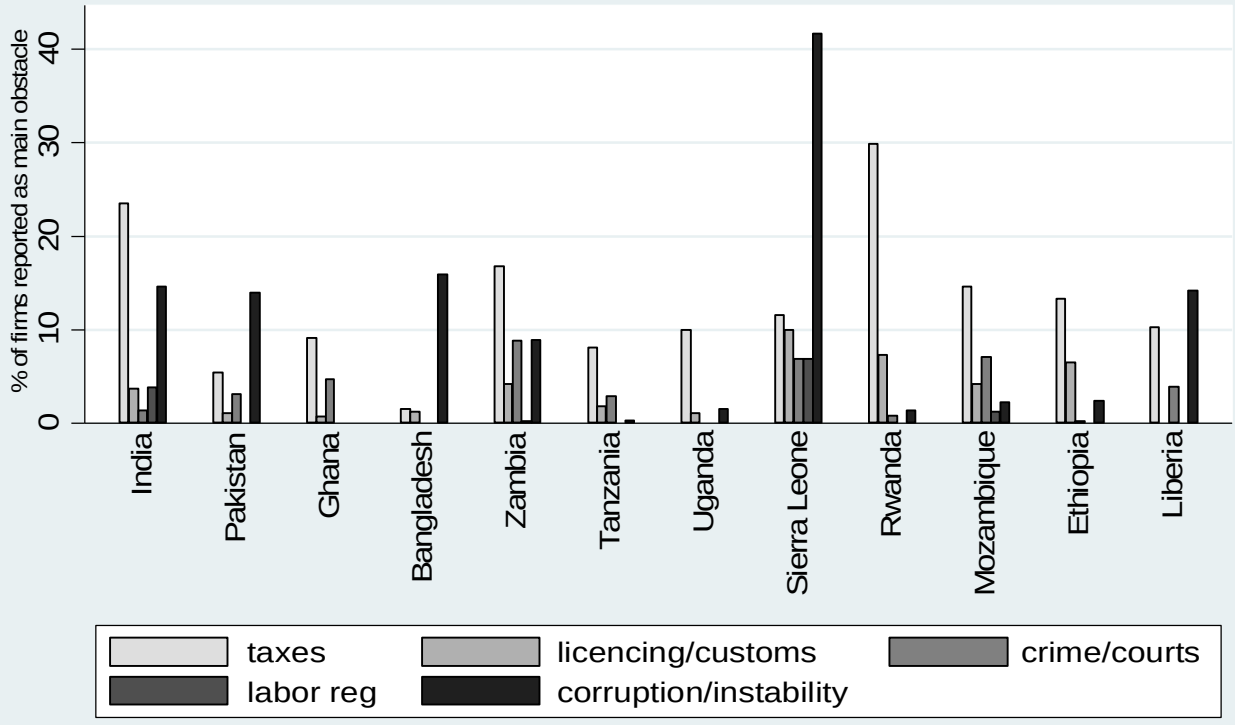
Source: WBES

Figure 6A: Institutional Constraints for Small Firms (size 5-19)



Countries ordered from richest to poorest according to GDP per capita(PPP) in 2006.

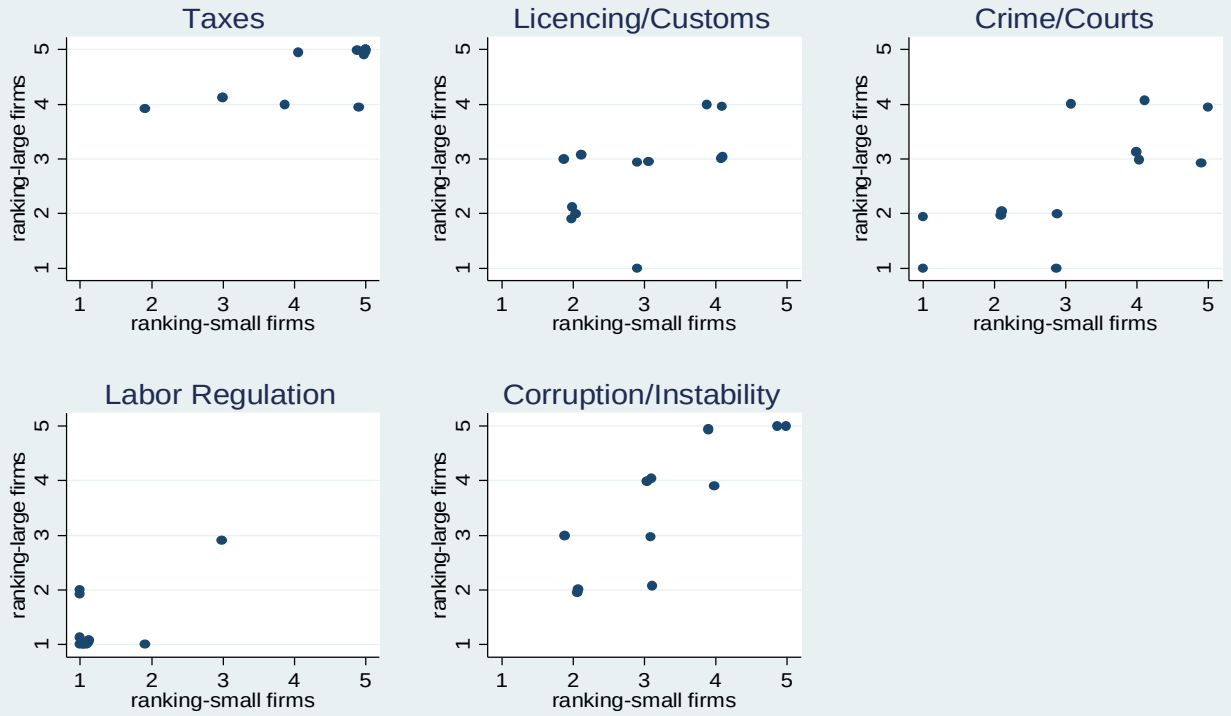
Figure 6B: Institutional Constraints for Large Firms (size 20-99)



Countries ordered from richest to poorest according to GDP per capita(PPP) in 2006.

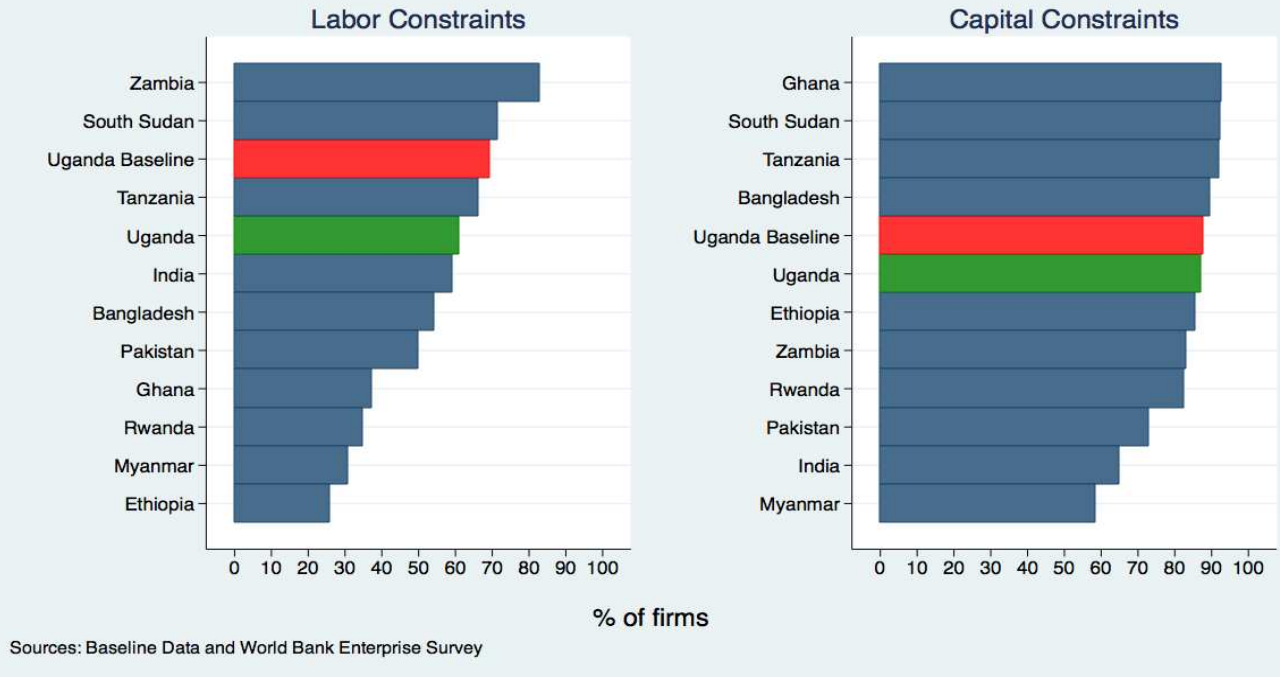
Source: WBES

Figure 7: Ranking Institutional Constraints by Firm Size



Notes: each observation represents the ranking by importance of a constraint within a country. Location of points has been perturbated to show overlapping observations.

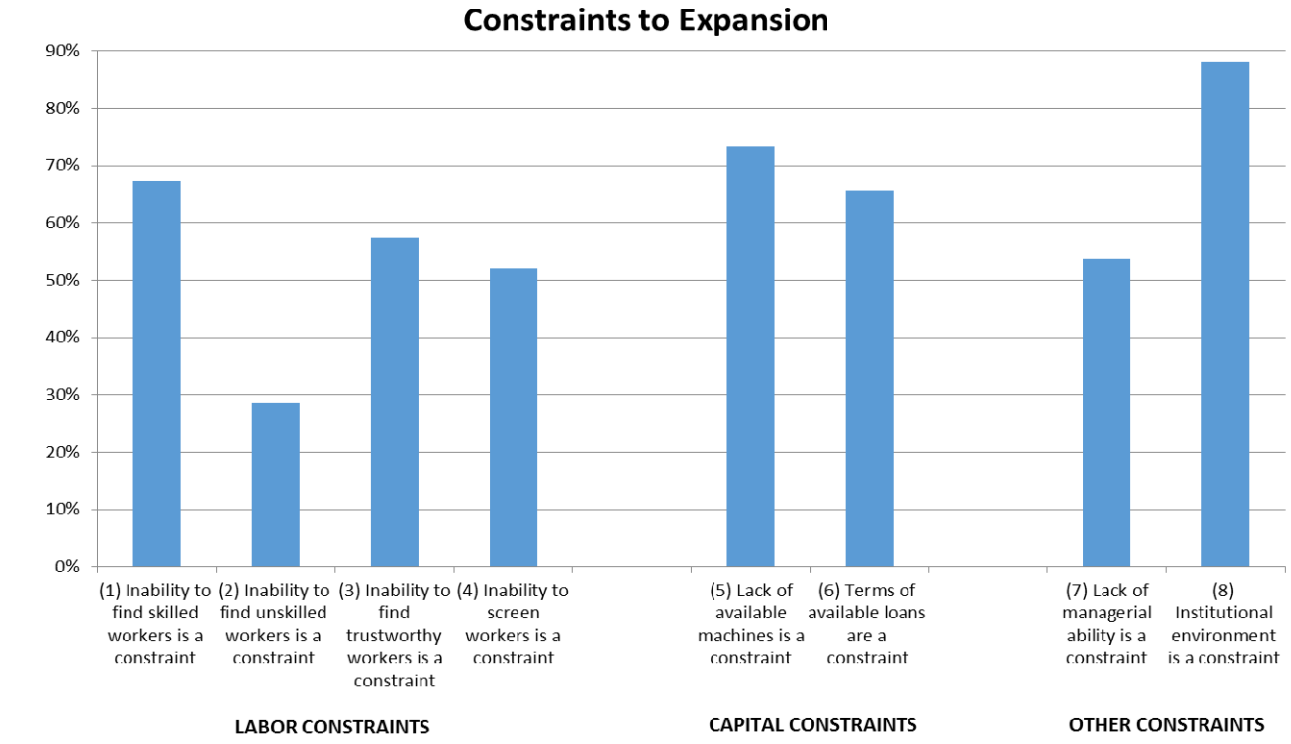
Figure 8: Labor and Capital Related Constraints Across LDCs

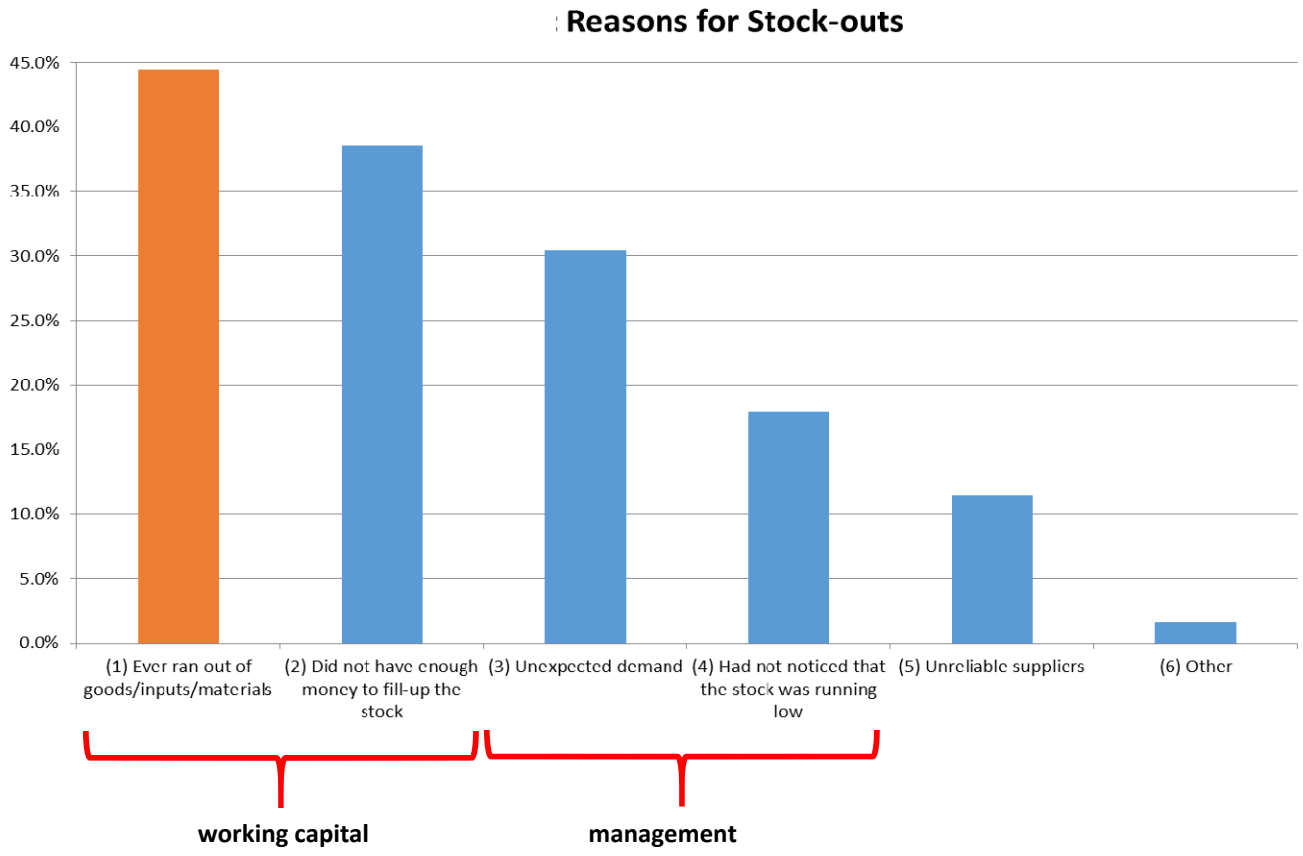


Sources: Baseline Data and World Bank Enterprise Survey

Source: WBES

Figure 9: Perceived Constraints





Source: Authors own ongoing work with various co-authors

Figure 10: Worker Recruitment Channels

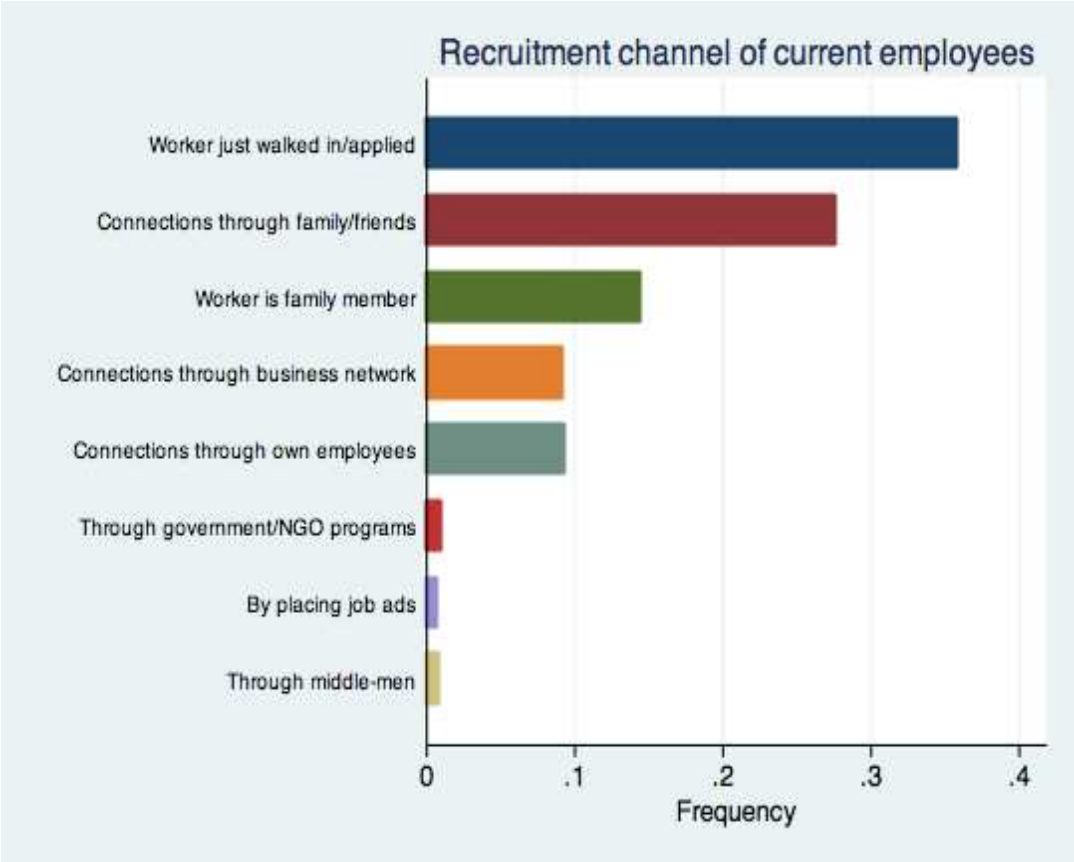
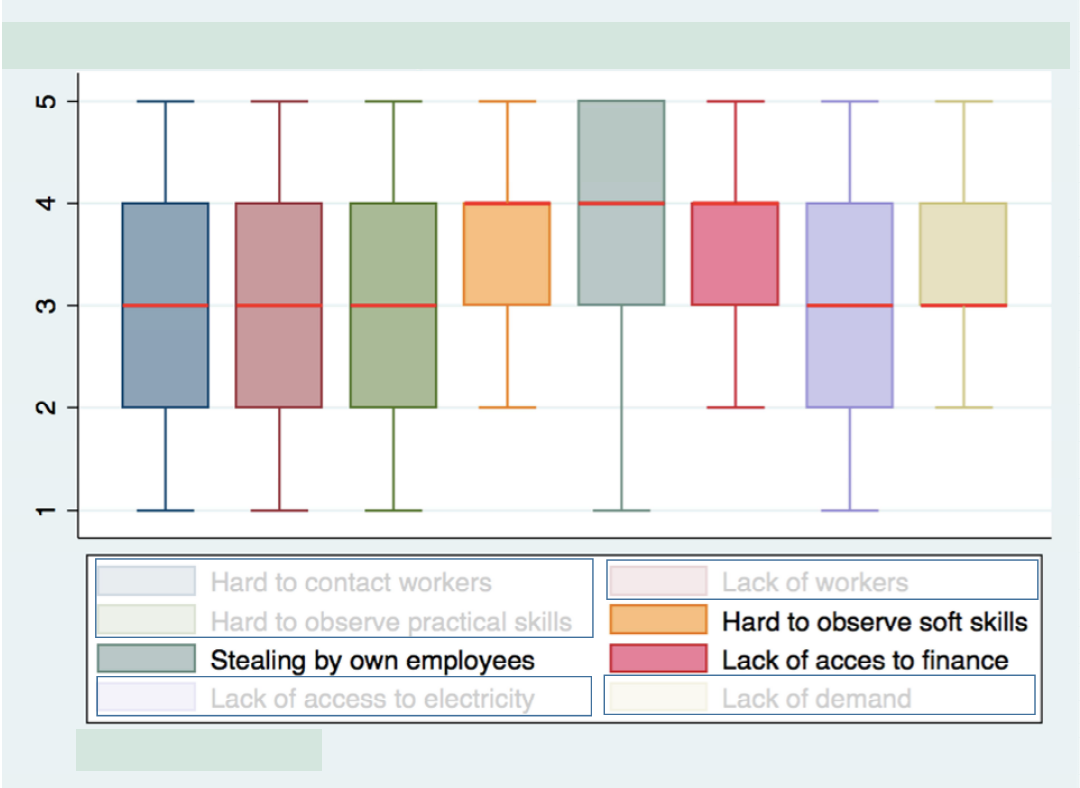


Figure 11: Perceived Importance of Labor Market Constraints



Source: Authors own ongoing work with various co-authors

Figure 12: Information Firm Owners Would Like to Observe on Potential Hires

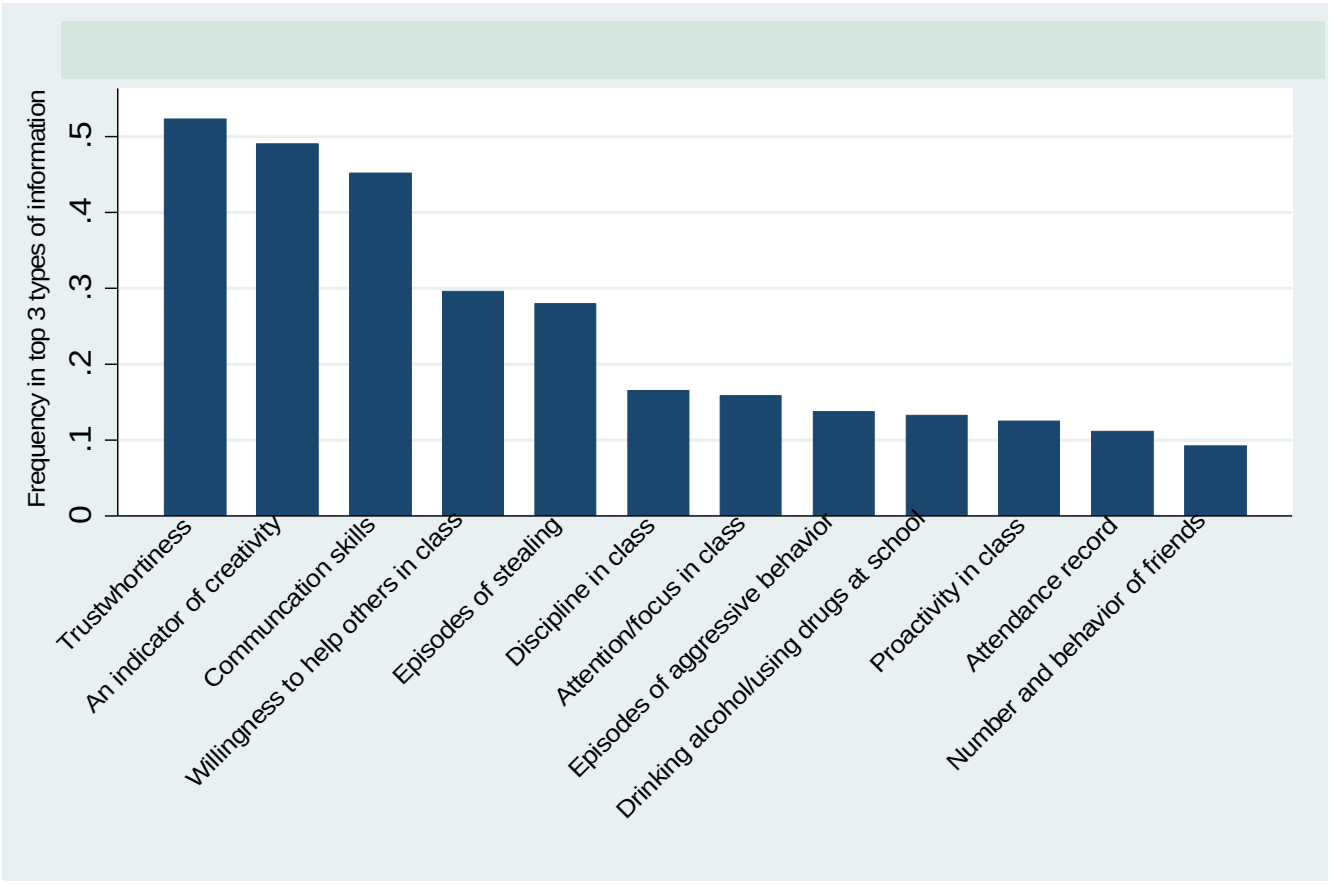
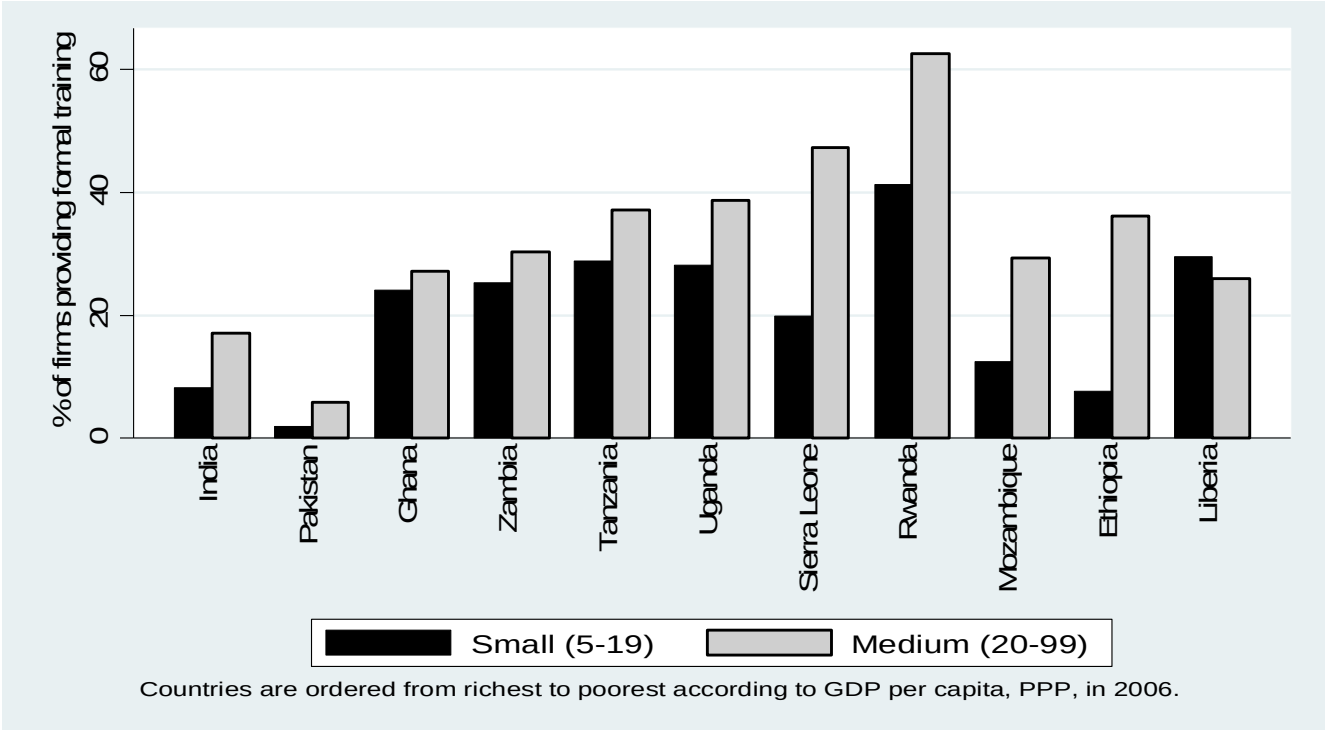
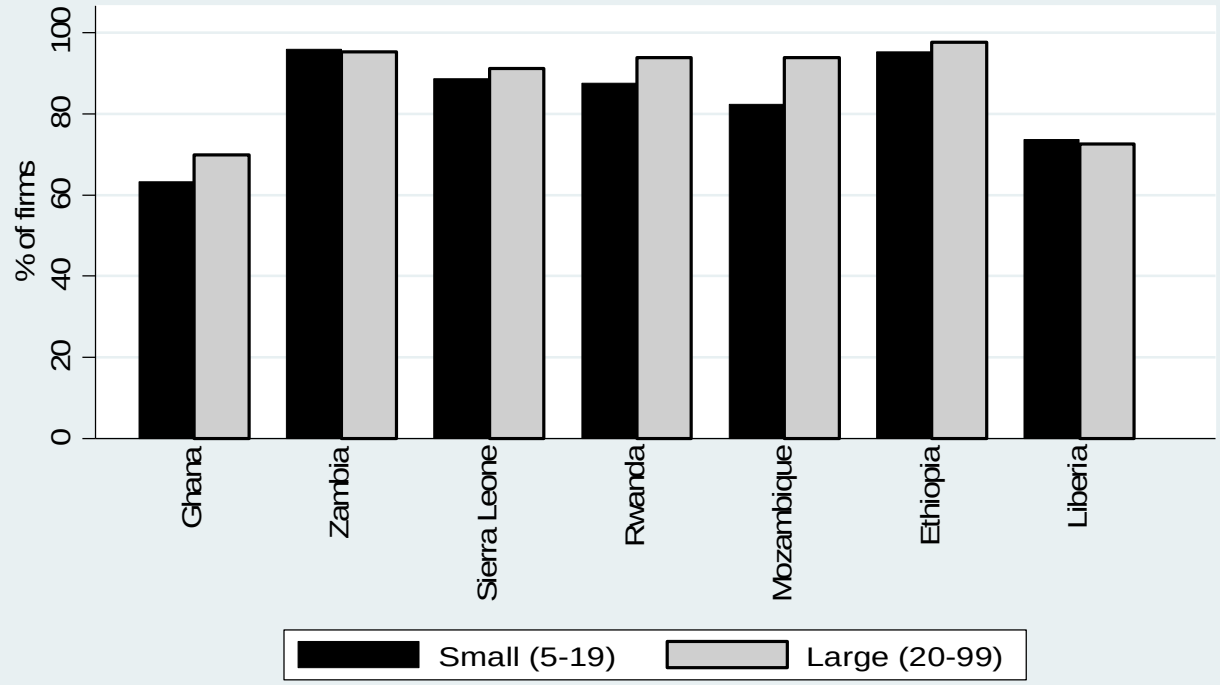


Figure 13: Provision of Formal Training



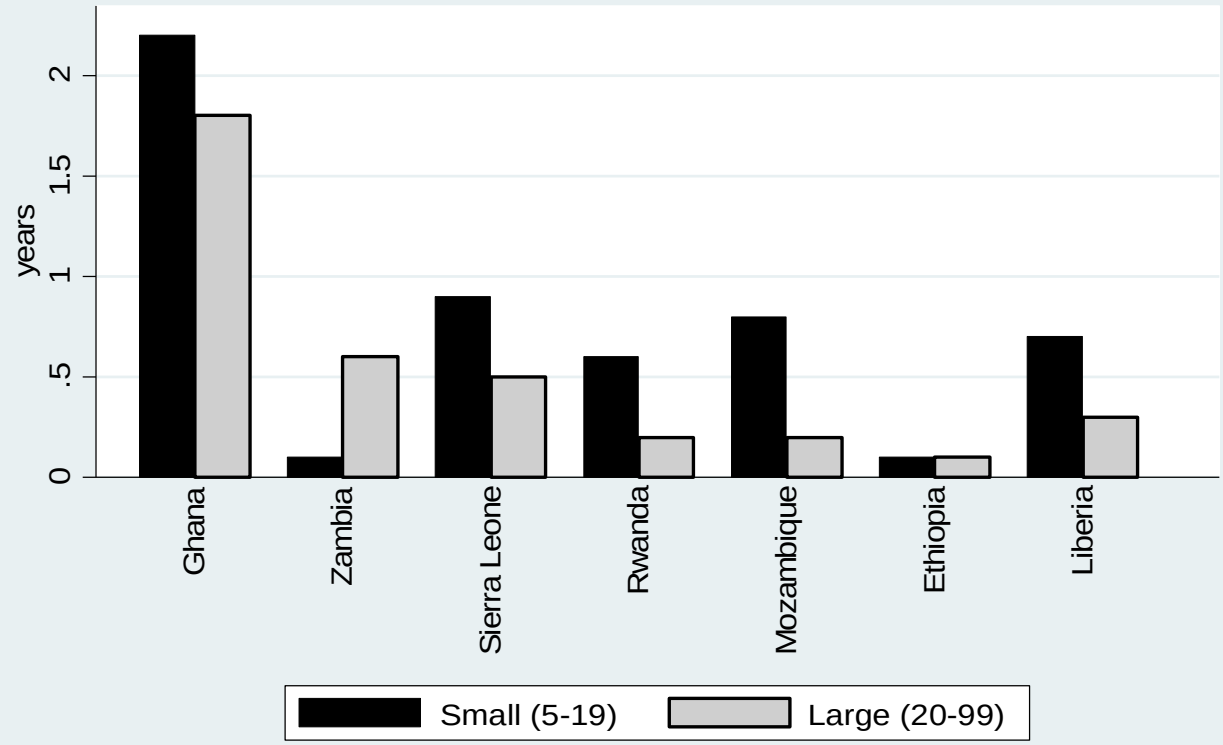
Source: Figure 12, Authors own ongoing work with various co-authors; Figure 13, WBES.

Figure 14: Firms Formally Registered When Started



Countries are ordered from richest to poorest according to GDP per capita, PPP, in 2006.

Figure 15: Number of Years Firms Operated Without Registration



Countries are ordered from richest to poorest according to GDP per capita, PPP, in 2006.

Source: WBES

Table 1: Correlation Among Non-cognitive Skills

Pairwise correlation coefficients

	Creativity	Communication skills	Willingness to help others	Attendance	Trustworthiness
Creativity	1				
Communication skills	.0824	1			
Willingness to help others	.0989	.6329	1		
Attendance	.0727	.6608	.6583	1	
Trustworthiness	.0472	-.0346	-.0615	.0357	1

Table 2: Comparison with Pilot Results from Six Countries
Standard Errors in Parentheses, Clustered by BRAC Branch Area

Panel A	(1) Total per capita consumption, standardized	(2) Food security index	(3) Asset index	(4) Financial inclusion index	(5) Total time spent working by main woman, standardized	(6) Total time spent working by both respondents pooled, standardized	(7) Incomes and revenues index
Treatment effect - four year endline	0.314***	0.256***	0.327***	0.313***	0.122*	0.065	0.627***
	(0.034)	(0.079)	(0.029)	(0.040)	(0.065)	(0.047)	(0.074)
Treatment Effect in Banerjee et al (2015) - three year endline	*0.120****	*0.113****	*0.249****	*0.212****	*n/a*	*0.054****	*0.273****
	(0.024)	*(0.022)*	*(0.024)*	*(0.031)*		*(0.018)*	*(0.029)*

Panel B	(8) Physical health index	(9) Mental health index	(10) Political Awareness index	(11) Women's empowerment index
Treatment effect - four year endline	0.108***	0.077*	0.269***	0.077
	(0.027)	(0.043)	(0.091)	(0.056)
Treatment Effect in Banerjee et al (2015) - three year endline	*0.029*	*0.071****	*0.064****	*0.022*
	(0.020)	*(0.020)*	*(0.019)*	*(0.025)*

Source: Bandiera et al. [2016]