

# Informality

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## I. Introduction

In developing countries, informal firms account for up to half of economic activity. They provide livelihood for billions of people. Yet their role in economic development remains controversial. Some, like Hernando De Soto (1989, 2000), see informal firms as an untapped reservoir of tremendous entrepreneurial energy, held back by government regulations. Unleashing this energy by reducing entry regulations or improving property rights would fuel growth and development. Others, like Levy (2008), take a more cynical view, stressing the advantages enjoyed by informal firms and workers from avoiding taxes and regulations. The McKinsey Global Institute (Farrell 2004) takes this perspective further, and sees informal firms as parasites competing unfairly with law-abiding formal firms. Informality should be suppressed not unleashed.

Still others follow the development tradition of Lewis (1954), Harris-Todaro (1970) and more recently Rauch (1991) and see informality simply as a byproduct of poverty. From this dual perspective, formal and informal firms are fundamentally different. Productive formal entrepreneurs pay taxes and bear the cost of government regulation in order to reach new customers, raise capital, and access public goods. These entrepreneurs are often educated, and find it more profitable to run the bigger formal firms than the smaller informal ones. In contrast, informal entrepreneurs are typically uneducated and unproductive; they run small businesses producing low quality products for low income customers using little capital and adding little value. They do not threaten formal firms. Nor would informal firms benefit much from formality. The increase in firm value that the informal entrepreneurs or managers

could realize by operating formally is not large enough to offset the additional costs from taxes and regulations. In this view, development comes from formal firms, and their expansion as the economy modernizes eventually dooms the informal economy.

In this paper, we attempt to assess these perspectives. We do so in two steps. To begin, we establish five critical facts about the informal economy. First, it is huge, especially in developing countries. Second, it is tremendously unproductive compared to the formal economy: informal firms are small, inefficient, and run by poorly educated entrepreneurs. Third, although avoidance of taxes and regulations is an important reason for informality, informal firms are too unproductive to thrive in the formal sector. Lowering registration costs neither brings many informal firms into the formal sector, nor unleashes economic growth. Fourth, the informal economy is largely disconnected from the formal economy. Informal firms rarely transition to formality, and continue their existence, often for decades, without much growth or improvement. Fifth, as countries grow and develop, the informal economy eventually shrinks and disappears. The formal economy comes to dominate economic life.

We then turn to the critical question of how the informal economy shrinks. The evidence suggests that economic growth comes from the formal sector: firms run by educated entrepreneurs and exhibiting much higher levels of productivity. The expansion of the formal sector leads to the decline of the informal sector in relative and eventually absolute terms, although informal employment can stay high for a long time especially when labor force growth is high. A few informal firms convert to formality, but more generally they disappear because they cannot compete with the much more productive formal firms. Our evidence is not particularly supportive of either De Soto's romantic view of informality, or the McKinsey parasitic view. The dual perspective on informality comes out as the one most consistent with the data.

## II. Five Facts about Informality

### *The Informal Economy is Huge*

Measuring the informal economy is inherently difficult. Much of informality is in farming, be it subsistence agriculture or informal sales of marketable crops. A large part, at least in terms of employment, also comes from self-employed sellers and peddlers living at near-subsistence levels (Banerjee and Duflo 2011). Yet even if we look at the more substantial businesses that employ workers, such as repair shops, furniture or metal-working factories, or transport firms, there are many forms of informality. At one extreme, there are firms that literally do not exist in the eye of the authorities: they do not register or comply with regulations, they make all their transactions including sales and wage payments in cash, they do not have bank accounts, they do not pay taxes. At another extreme, as we saw in transition economies (Johnson, Kauffman, and Shleifer 1997), totally official registered firms transact in cash or otherwise hide their sales from authorities to avoid taxes. And there is everything in between, such as firms that obtain operating permits but do not pay social security taxes.

Despite these ambiguities, several methods have been used to assess the size of the informal economy. These include surveys of experts about their countries, such as those conducted by the Global Competitiveness Report, surveys of entrepreneurs about their own activities, conducted by the World Bank Enterprise Surveys, census counts of people reporting that they are self-employed, typically a good proxy for informality, measures inferred from the comparison of aggregate electricity consumption to that by the formal sector (on the plausible assumption that informal firms must also use electricity), and even predictors based on a range of indicators of the economic environment and development. La Porta and Shleifer (2008) discuss the pros and cons of alternative measures.

Table 1 presents various measures of the size of the informal sector, with 185 countries grouped by the quartile of per capita income. Fortunately, the very different measures of informality all paint a

very consistent picture. Depending on the indicator, the informal sector accounts for 30-40 percent of total economic activity in the poorest countries, and a higher share of employment. This falls to something closer to 15 or 20 percent in the richest quartile countries. The last column of Table 1 offers another perspective: the poorest countries average about 3 registered firms per thousand people; in the richest quartile countries, this number rises to 42. Especially in the poor countries, the informal sector is huge, accounting for a giant share of output and employment.

### *Informal Firms are Small, Unproductive, and Stagnant*

For two decades, the World Bank Enterprise Surveys surveyed entrepreneurs and managers in both formal and informal firms, collecting data on their sales and inputs, employee and manager education, as well as a variety of assessments of the institutional environment. These data, which we analyzed in La Porta and Shleifer (2008) and Gennaioli et al. (2013), provides considerable evidence on the determinants of productivity of firms in developing countries, including their managers. World Bank surveys deal with actual businesses such as furniture producers or shoe factories; they do not cover the proverbial sellers of flowers and vegetables, who are also informal but even less productive.

Table 2 summarizes the results of an extensive analysis of size and productivity of formal and informal firms using data from poor countries where World Bank surveyed both formal and informal businesses. Several findings stand out. First, informal firms – even the real businesses surveyed by the World Bank – are much smaller than formal firms. Across the poor countries in the survey, sales average 10 times more for formal than for informal firms. Employment differences are even more dramatic. An average formal firm employs 126 people, while an average informal firm only 4. Perhaps most critical for our analysis are the differences in productivity, here calculated as value added (sales net of expenditures on raw materials and energy) per employee. Averaging across all the surveys, we find that

informal firms add only ONE FIFTH the value per employee compared to what formal firms do. The ratio of value added by informal firms to that by formal firms ranges from 1% in Congo to 71% in Cape Verde. La Porta and Shleifer (2008) present some evidence indicating that these productivity levels reflect reality, rather than just underreporting of output to interviewers by informal firms.

To appreciate the economic significance of these numbers, consider the case of Brazil, where the productivity gap stands at 30%. The data in Table 2 imply that the income of an entrepreneur in an average informal firm is a fraction of the average wage of a formal worker<sup>1</sup>. Many informal entrepreneurs would gladly leave their firms to work for Wal-Mart if offered the chance, even if wages in the formal sector are taxed while income in the informal sector is not.

There are two other ways to see the extreme inefficiency of the informal sector. First, La Porta and Shleifer (2008) compare value added of informal firms to that of formal firms of different sizes. Although productivity increases with size within the formal sector (see also Hsieh and Olken 2014), there is a sharp productivity difference between informal firms and formal firms of the same size. Inefficiency of the informal sector is not just the matter of small size. Second, La Porta and Shleifer (2008) also find that, averaging across countries, wages in informal firms are roughly half of those in small formal firms, and less than a third of those in large formal firms, another indication of low productivity.

At first glance, the reason for low value added is extremely low quality of products produced by informal firms. Although this quality is difficult to measure, our visits to furniture and metal-working factories in Kenya and Madagascar revealed extreme crudeness of the products being made, usually

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<sup>1</sup> Table 2 implies that the income of an entrepreneur in an average informal firm ( $Y_{E,I}$ ) in Brazil is a fraction of the average wage of a formal worker ( $Y_{W,F}$ ). Let  $\alpha_{E,I}$  be the share of value added  $V_I$  received by an entrepreneur in the informal sector. Her income equals:

$$Y_{I,E} \equiv \alpha_E * V_I = \alpha_E * (0.3 * V_F / L_F) * L_I = \alpha_E * (0.3 * V_F / L_F) * 2.42 = \alpha_E * 0.73 * (V_F / L_F) \approx \alpha_E * Y_{F,W}$$

based on replacing  $V_I/L_I$  by 0.3 of its analogue in the formal sector ( $V_F/L_F$ ),  $L_I$  by 2.42, and assuming that  $Y_{F,W} \approx 0.73 * [V_F / L_F]$ . This is a huge income gap given that the entrepreneurs' share of value added is likely under 20%.

with fairly basic tools, even when the raw material (as in the case of furniture) was hard wood. Informal entrepreneurs repeatedly expressed their fear of competition from Chinese imports. Informal factories appear to sell extremely low quality goods for low prices to low income customers. Informal entrepreneurs in Africa fear formal competition; they are far from threatening to formal firms.

La Porta and Shleifer (2008) explore the sources of productivity differences between formal and informal firms. One interesting finding is at least as measured by education, differences in the human capital of workers are small. There are no direct measures of capital, although formal firms are much more likely to have their own electricity generators. The most striking difference between formal and informal firms is in the human capital of their managers. Only 7% of the managers of informal firms have a college degree; this number is 76% for the formal firms. In production function estimates, managerial human capital emerges as a large and statistically significant determinant of productivity

Gennaioli et al (2013) report closely related findings for formal firms around the world. They document enormous productivity gaps between firms run by educated versus uneducated managers and entrepreneurs. Production function estimates imply nearly 30% returns per extra year of education of managers, even though estimated returns to worker education are in the standard range of 6-7%. The message that emerges consistently from all this work is that informal firms are hugely unproductive, and the principal reason for that in all likelihood is poor human capital of the people who run them.

The low productivity of informal firms is reflected in their growth rates as well. La Porta and Shleifer (2008) report sharply lower employment growth rates for informal than for formal firms (5% vs. 10% per year). Indeed, an average informal firm in World Bank Enterprise Surveys had been around for nearly a decade; and has continued its existence with only modest growth even during a period of rapid growth of formal firms. In a similar vein, de Mel et al. (2008) find that roughly 70% of own account workers in Sri Lanka have backgrounds, abilities, and attitudes more similar to those of wage workers

than those of owners of firms and that they rarely expand by adding paid employees (see also Ardagna and Lusardi, 2008). These findings line up with the evidence from the U.S.: most US small businesses have little desire to grow big or to innovate in any observable way (Hurst and Pugsley 2011).

### *Regulation is not what Keeps Informal Firms down*

Some of the controversies related to informality concern the question of why informal firms do not become formal. De Soto (1989) has famously argued that informal firms would like to become formal, but are held back by corruption and government regulation. World Bank Enterprise Surveys of informal entrepreneurs allow a direct assessment of this view. Table 3 compares perceived obstacles to doing business reported by informal and formal entrepreneurs. By far the greatest perceived obstacle by both types of firms is lack of access to finance, although informal firms perceive this as a much greater problem. The link between access to finance and registration may not be causal, however. For example, some of the informal firms we visited maintained several months of (extremely slow selling) inventory without realizing that it is a form of capital. Their owners simultaneously complained that they did not have financing to buy tools. Similarly, banks may only lend to skilled entrepreneurs or want to see some form of control system (e.g. accounting books) that informal entrepreneurs lack. Lack of human capital might be at the heart of the perceived inaccessibility of finance.

Next to perceived financing problems, government regulations are distant concerns. Fewer than 10% of either formal or informal firms worry about corruption, business licensing and permits, or the legal system. Lack of access to land is a bigger problem for informal firms, in part because a large fraction of them occupy their premises illegally and fear eviction. It is difficult to read this evidence as pointing to the institutional environment as the central obstacle to doing business for informal firms.

Table 4 presents even more direct evidence on the perceived costs and benefits of registering. Again, better access to financing leads the list of perceived benefits, followed by better access to raw materials. Expectations of fewer bribes to pay and of better legal foundations of property lag far behind. This evidence does not mean that the institutional environment that informal firms face is good – on the contrary they face terrible problems of corruption, police abuse, and crime. In some countries, informal entrepreneurs report that up to 3% of their sales are stolen. Rather, the evidence suggests that informal firms do not see that formality will get them out of these problems: they will face corrupt and abusive policemen, inspectors, and other officials anyhow. In the meantime, informal firms report that “other firms like their” evade about 75% of taxes. Evading taxes is too attractive to be offset by the meager benefits of formality that the informal entrepreneurs would realize.

#### *Informal Firms Rarely Become Formal*

Another way of looking at the transition question is to ask how often informal firms become formal. The answer is almost never. In La Porta and Shleifer (2008), we report that on average 91 percent of registered firms started out as registered. An average surveyed informal firm has been in business for nearly a decade, without attempting to become formal. Also consistent with this observation, only 2% of informal firms sell their output to large firms (vs. 14% of firms in the Enterprise Survey). Informal firms inhabit an economic space of their own, disconnected from the formal space.

The near absence of transitions to formality raises the critical question of whether government obstacles to registration keep firms informal. De Soto’s (1989) emphasis on the costs of registration encouraged systematic data collection of entry costs around the world by Djankov et al. (2002). Their approach was in turn adopted by the World Bank in its Doing Business report, which since 2003 published a variety of measures of business regulation, including the regulation of entry, and country



rankings. In response to this publicity, the regulation of entry has been dramatically simplified across the world. The Doing Business website reports 378 policy actions aimed at lowering the cost of registration in 160 countries. These policy reforms have generated a wealth of data on the impact of registration costs on the decision to register and –to a lesser degree- on the impact of formality on productivity.

The most compelling evidence comes from two field experiments. The first was carried out in Belo Horizonte, a city in the Brazilian state of Minas Gerais, to test which government actions induce informal firms to register.<sup>2</sup> Firms were randomly assigned to a control group or one of four treatment groups: the first received information about how to formalize; the second received this information and free registration costs along with the use of an accountant for a year; the third group was assigned to receive an enforcement visit from a municipal inspector; while the fourth group was assigned to have a neighboring firm receive an enforcement visit to see if enforcement has spillovers. De Andrade et al. (2013) report that the likelihood of registering increases by 21 to 27 percentage points if the firm receives an actual inspection, but it is unaffected by the other three interventions. Most informal firms do not formalize unless forced to do so, most likely because the benefits of registering are low.

The second field experiment was carried out in Sri Lanka. De Mel et al. (2013) report that information about the registration process and even actual reimbursement of direct costs of registration had no effect on formality. In contrast, around one-fifth (half) of eligible firms registered when offered payments equivalent to one-half to one month (two months) of the median firm's profits. Interestingly, firms were tracked over the 15, 22, and 31 months after the intervention. Firms that formalized had

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<sup>2</sup> The background of the field experiment is of independent interest. The process of simplifying the process of business registration started in 1996 with the SIMPLES program, which consolidated multiple tax payments and contributions into single payment, lowering the tax burden on small firms. It was followed by the Minas Facil program in the state of Minas Gerais in 2005 to reduce number of procedures and time to start a business. Despite these efforts, survey data from 2009 reveal that 72% of firms in Minas Gerais were still informal.

higher profits, but this effect was largely due to a few firms that experienced substantial growth. Jaramillo (2009) reports similarly small effects of easier registration from an experiment in Lima, Peru, the city whose informal sector De Soto has celebrated.

The evidence from registration is one lens on informality. Another lens is the growing evidence on the effects of micro-credit, which shows that such credit helps informal entrepreneurs a bit, but almost never jumpstarts significant growth or transforms them into formal businesses (Karlan and Zinman 2011). Still another lens comes from the emerging image of slums as domains of permanent informality rather than hubs of transition between agriculture and the formal sector (Marx et al. 2013).

The picture that emerges from these and many other studies is fairly depressing. Informal firms start out and live out their lives informal, they avoid taxes and regulations, they do not trade with the formal sector. It is fairly difficult to lure them into becoming formal, even with subsidies. Far from being reservoirs of entrepreneurial energy, they are swamps of backwardness. They allow their owners and employees to survive, but not much more.

#### *As Countries Develop, Informality Becomes Less Important*

Important as the informal economy is in poor countries, it becomes much less significant in the richer ones. We already saw in Table 1 that all the estimates of the size of the informal economy decline with per capita income. Figure 1 illustrates this point more clearly by showing a strong negative correlation between per capita income and the share of economic activity that is informal as measured by the share of self-employment in total employment. Very similar results obtain with the other indicators from Table 1. As an economy develops, eventually informality shrinks.

We have focused on perhaps the most basic facts about the informal economy. It is extremely large in the poorest countries, but it eventually shrinks as countries develop. It is incredibly unproductive. Informal firms rarely transition to formality, even when encouraged or subsidized to do so; rather they carry on without much growth or improvement for long periods of time. They are run by uneducated entrepreneurs. Government policies are definitely a hindrance for informal firms, but they are a hindrance to formal firms as well. Bad government is not the main problem of informal firms: their main problem is that they add so little value.

All this evidence is broadly consistent with the dual model, which sees the formal and the informal sectors as largely unconnected. In fact, a useful analogy might be the empirical finding in international trade, called the Linder effect, which holds that rich countries trade predominantly with other rich countries, and poor countries with other poor countries. One explanation of the Linder effect is that poor countries both produce and demand low quality products, while rich countries both produce and demand high quality products, perhaps because they have very different human capital endowments (Murphy and Shleifer 1997). If we think of the informal sector as the community of poor countries, and the formal sector as the community of rich countries, the Linder effect might accurately represent the dual structure of poor country economies.

### III. How does the Informal Economy Disappear?

The decline in the size of the informal economy with development raises the critical question: how does it shrink? The question is particularly pertinent since the informal firms have significant economic advantages of not paying taxes or complying with regulations. Indeed, these advantages lead several observers such as Levy (2008) to advocate leveling the tax playing field, which he feels is

unfortunately tilted to favor informal employment. The McKinsey Global Institute likewise advocates bringing informal firms under the regulatory umbrella.

The trouble with these views is the amazing consistency of the decline in informality across countries following radically different policies toward informal firms. It is nearly impossible to imagine how, if tax and regulatory policies (whose measured influence is small) are critical determinants of the size of the informal sector, this sector shrinks with development regardless of policies. La Porta and Shleifer (2008) run cross-country regressions of the size of informal economy on policy variables and per capita income. Although some policy variables, such as corruption or entry regulation are statistically significant in some specification, they are not consistently so, while per capita income always matters. It looks like the informal economy declines for reasons other than policies seeking to eradicate it.

The obvious alternative begins with the fundamental finding in Table 2 that informal firms are extremely inefficient, and maintains that informality disappears as a byproduct of economic growth and development, as efficient formal firms replace inefficient informal ones. This is the strong prediction of the dual approach to informality. As we show below, the available evidence both from the cross-section and from country examples strongly supports this prediction.

Figure 2 presents graphically the results of a regression at annual frequency with country fixed effects of change in the percent of labor force in self-employment, a reliable and widely available measure of informality, on change in log GDP. Figure 2 shows that faster economic growth is associated with a more rapid decline in self-employment. The parameter estimates imply that doubling GDP per capita is associated with a reduction in self-employment of 4.4 percentage points (the mean of self-employment is 26% and its standard deviation is 16%). This estimate points to remarkably slow transition to formality. It says that a country that starts with 50% self-employment, and then grows

consistently at 7% per year so that per capita income doubles every 10 years, will see its self-employment fall to the rich countries' 20% after 50 years. Informality disappears slowly indeed.

Figure 3 illustrates this phenomenon for three rapidly growing countries: Korea, Chile, and Peru. Korea is the textbook example. Between 1990 and 2012, its per capita income rose 2.5-fold. During this period, the share of labor force classified as employees rose from 60 to 72%, and the share of self-employed fell from 40 to 28%. A very important fact about Korea, also seen in the figure, is that its labor force during this period grew by only 34%, so the growth of formal employment share comes largely from the increase in formal employees and actual decline in the number of self-employed.

During the same period, GDP per capita rose 2.3-fold in Chile, but its labor force grew almost 70% from 5.0 million to 8.5 million. We do not see the same kind of reallocation of labor between formal and informal sectors. Indeed, the formal share of employment in Chile has increased only slightly even though, during this period, formal employment increased from fewer than 4 million to nearly 6 million persons. Chile teaches an important lesson: the employment share of the informal economy is kept up by the growing population and labor force.

These conflicting forces are illustrated most dramatically by the case of Peru, the country of De Soto's enthusiasm for the potential of the informal sector. During the period 1990-2012 the Peruvian economy has grown nearly as fast as Korea's (2.1-fold) thanks to aggressive liberalization policies and the defeat of Maoist guerillas. Yet the Peruvian labor force grew almost as fast as its per capita income, and much of the labor absorption was done by the informal sector. As a consequence, despite the tremendous economic growth, over this period the share of formal employment in Peru has declined, and that of informal employment has increased, even though the level of total formal employment rose from 5 to 8 million people.

Figure 4 shows where Peruvian growth has come from. For the period of 1990-2010, it uses Peruvian census data to graph annual GDP per capita, annual income of formal employees, and annual income of the self-employed. Figure 4 shows rapid economic growth during this period, but also rapid increases in formal sector wages. In a striking contrast, incomes of the self-employed did not rise over this period. Economic growth was driven by the formal sector; the informal sector stagnated.

We do not know why labor force growth slows down the decline of the informal sector. In some models of dual economies, such as Murphy, Shleifer, and Vishny (1989a), greater aggregate demand should speed up industrialization. On the other hand, the fact that formal firms have so much higher output per worker surely keeps down their demand for labor. Moreover, if we take seriously the Linder effect analogy, then so long as labor force growth comes from poor families who demand goods produced by the informal rather than formal sector, the informal sector will maintain its relative size. Murphy, Shleifer, and Vishny (1989b) provide one model along these lines.

Table 5 presents one final perspective on this narrative. It uses sub-national data from Gennaioli et al. (2013) to examine firm formation and employment composition within countries as a function of each region's level of education. Table 5 shows that, within countries, the more educated regions have more formal establishments per capita, more formal employees both relative to population and relative to the number of establishments (i.e., larger firms), and more formal employees employed in large firms relative to population. Looking across regions within a country (so at least national institutions are held constant), development appears to be driven by human capital, and manifest itself in the greater role of the formal sector in the economy.

To us, the bottom line of this evidence seems straightforward. Economic growth comes from the formal sector which absorbs labor in part from the informal sector, but mostly from the new generations of workers. As economies grow, productivity and income in the informal sector stagnate.

Labor force growth slows down the absorption of labor in the formal sector, but eventually this process does take place. Some survey evidence on Peruvian slums collected and provided to us by Nathan Nadramija shows that it is mostly the children of the informal sector workers, rather than these workers themselves, who join the modern economy. As they do, the share of informal economy declines almost everywhere because the unproductive informal firms cannot survive in the modern economy.

#### IV. Conclusion

The evidence we have presented is not particularly supportive of either De Soto's (1989) enthusiasm for the productive potential of the informal sector or of McKinsey Global Institute's fear of its adverse effects. Rather, the evidence is broadly consistent with the dual view of informality: informal firms stay permanently informal, they hire informal workers for cash, buy their inputs for cash, and sell their products for cash, they are extremely unproductive, and they are unlikely to benefit much from becoming formal.

This approach generates the strong prediction that the cure for informality is economic growth. The evidence strongly supports this prediction: informality declines, although very slowly, with development. This is not to say that we oppose the structural policies such as simplification of registration advocated by De Soto (1989) or equalizing labor tax burdens across formal and informal sectors advocated by Levy (2008). These policies surely have desirable effects, but our reading of the evidence is that it is modernization, rather than structural policies, that shrinks informality.

The evidence on the decline of informality and the formation of formal firms is also broadly consistent with the basic conclusion of growth economics that human capital is the principal driver of development. Here the evidence suggests that growth is driven by the formation and expansion of

formal firms managed by educated entrepreneurs. Uneducated entrepreneurs – in both informal and formal sectors – generally run small and inefficient firms; educated entrepreneurs and managers run larger and more efficient firms. This is the dark side of dualism: informal economies are so large in poor countries because their entrepreneurs are so unproductive.

The evidence suggests that an important bottleneck to economic growth is not the supply of better educated workers; indeed, at least on many observable characteristics the workers are rather similar in informal and formal firms. Rather, the bottleneck is the supply of educated entrepreneurs – people who can run productive businesses. These entrepreneurs create and expand modern businesses with which informal firms, despite all their benefits of avoiding taxes and regulations, simply cannot compete. This is how the informal economy dies out in the process of development. From this perspective, the policy message for how to grow the formal economy and shrink the informal one is somewhat elitist: through immigration or education, increase the supply of educated entrepreneurs.

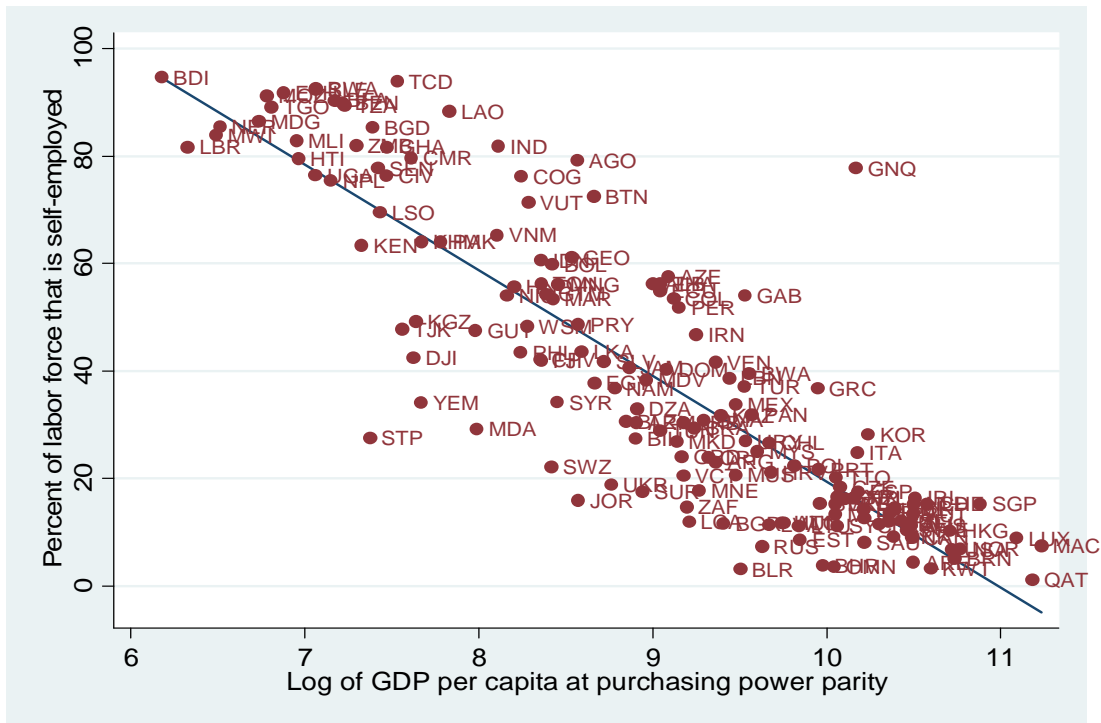


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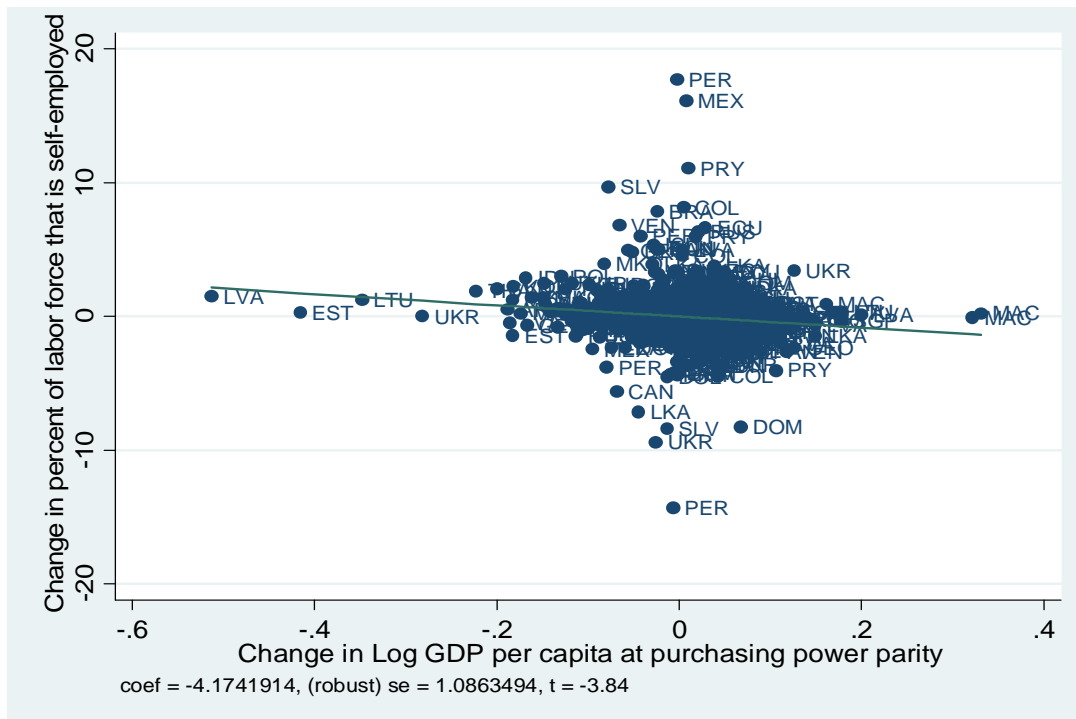
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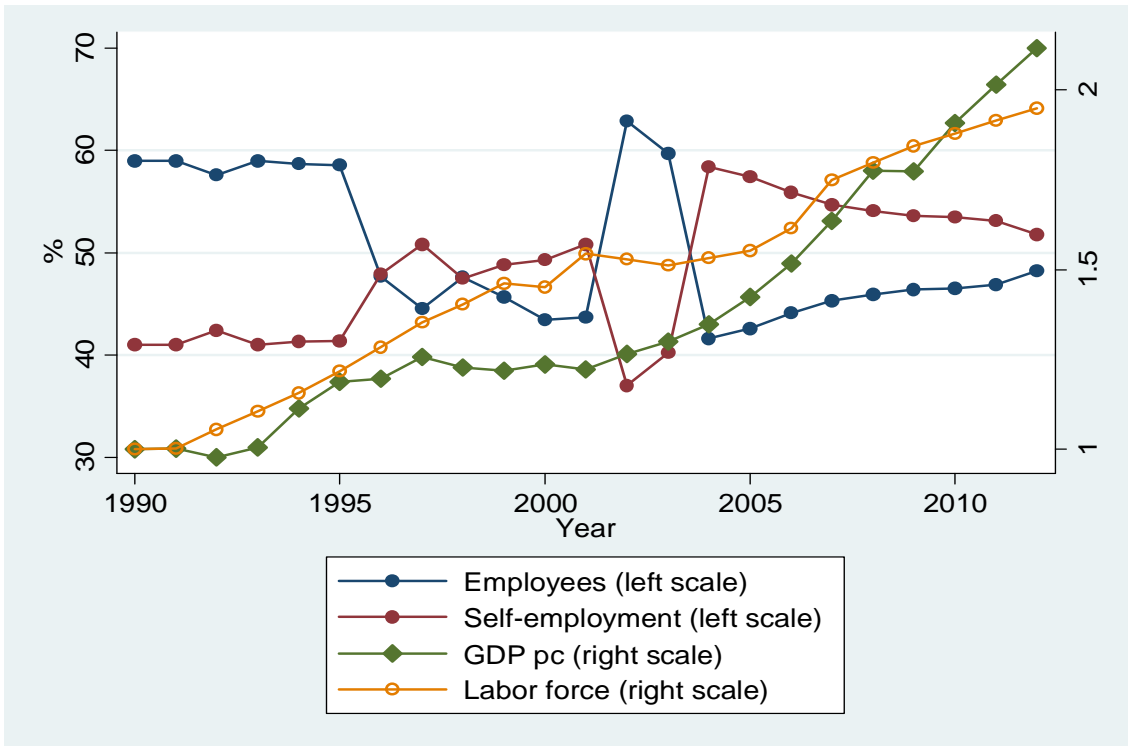
**Figure 1. Self-Employment and GDP per Capita**



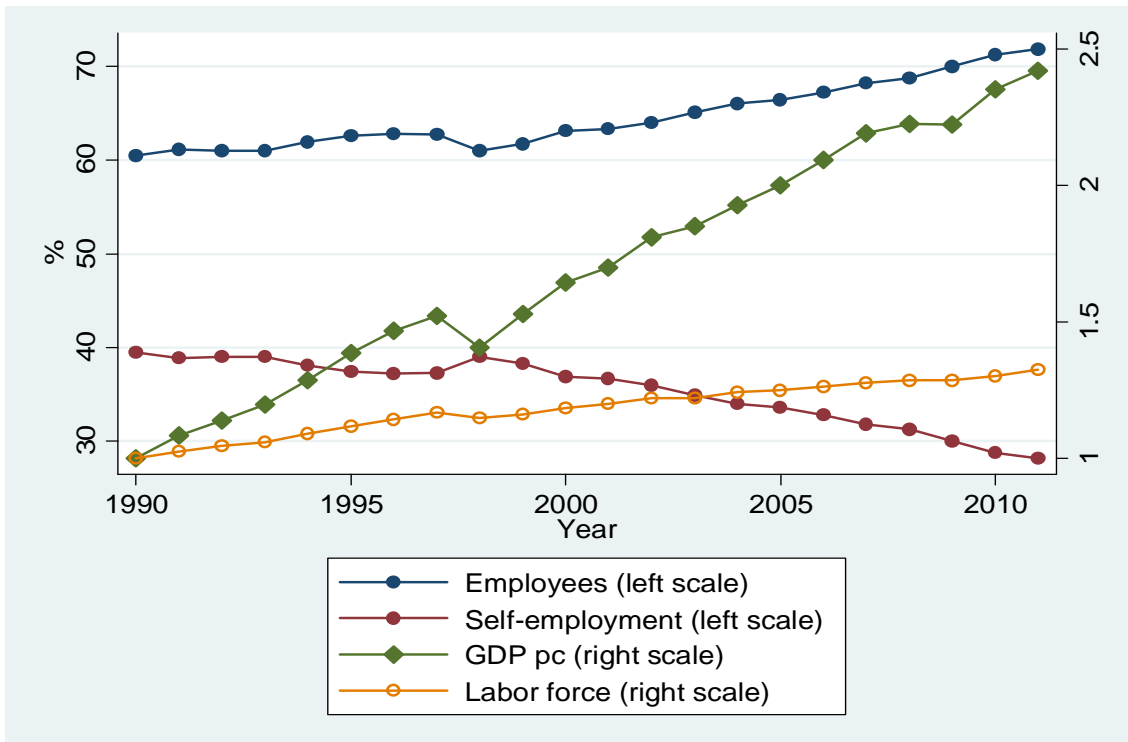
**Figure 2. Change in Self-Employment and Growth in GDP per Capita**  
(Controlling for country fixed effects)



**Figure 3**  
 Employment in different sectors in Peru (percentages)



Employment in different sectors in Korea (percentages)



**Figure 3 (continued)**  
Employment in different sectors in Chile (percentages)

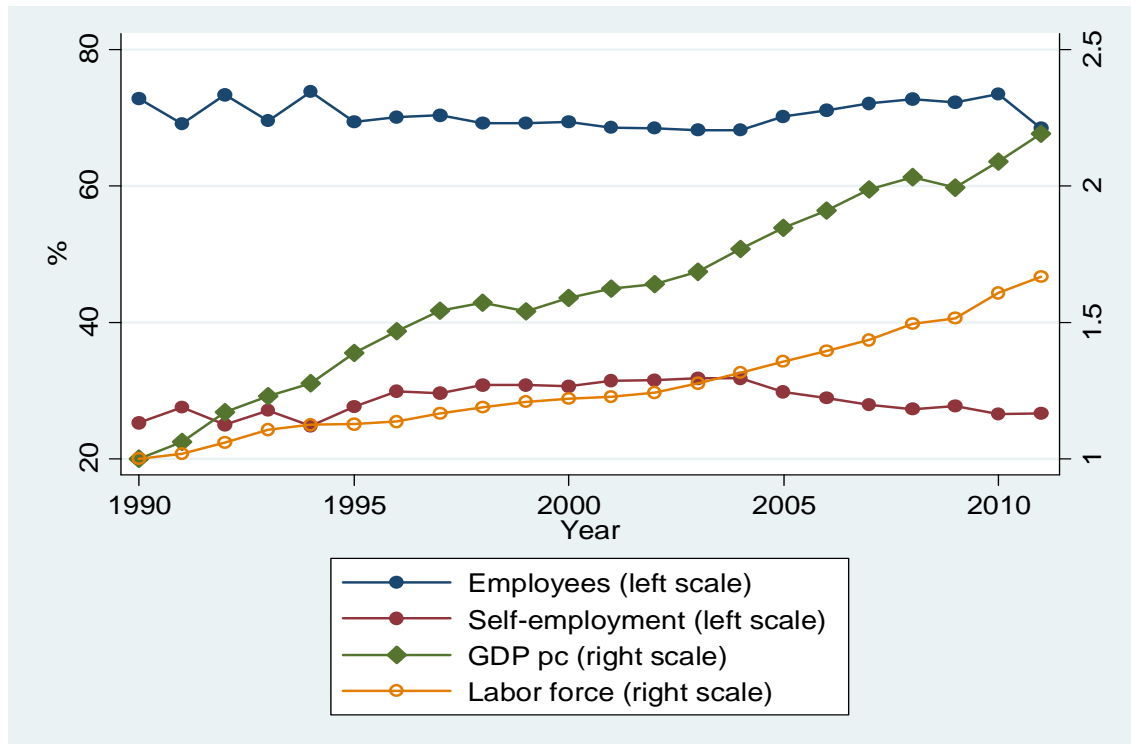
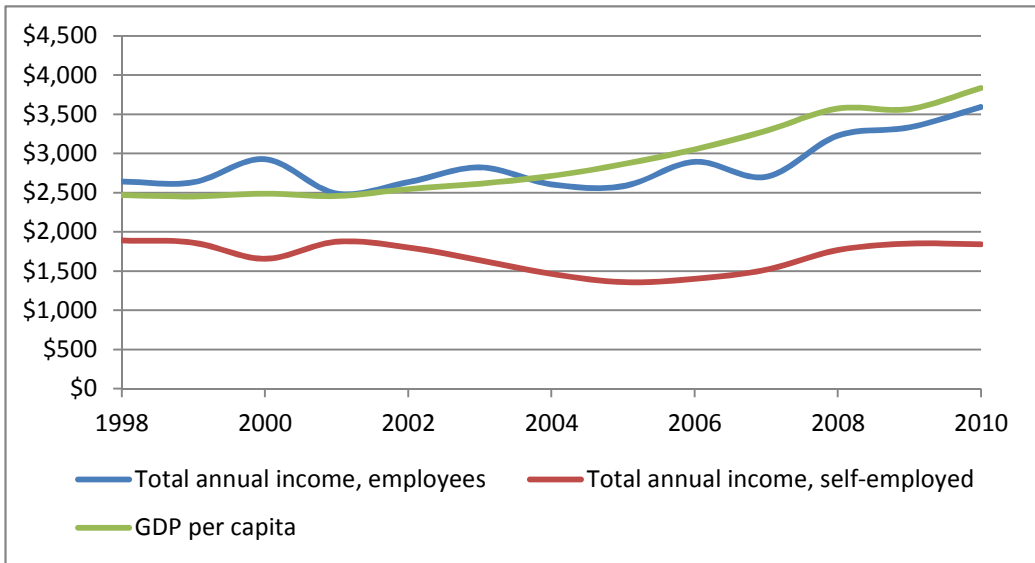


Figure 4: Income of employees, self-employed, and GDP per capita in Peru



**Table 1. Size of the Informal Economy by Alternative Measures**  
Percent except where stated otherwise

| Income quartile   | GDP/Population       | Measure of Informality                   |                                      |                    |                                      |   |   | Registered firms /<br>population (000s) |
|---|----------------------|--|--------------------------------------|--------------------|--------------------------------------|---|---|---|
|   |                      | % GDP Informal<br>(World Economic Forum) | % Tax Evasion<br>(Enterprise survey) | % Self-employment  | % Self-employment<br>non-agriculture | % GDP Informal<br>(electricity consumption) | % GDP Informal<br>(multiple indicators) |   |
| Bottom  | 429                  | 35.4                                     | 29.0                                 | 46.4               | 57.3                                 | 38.9  | 42.3                                    | 3.2                                     |
| Second  | 1,362                | 33.7                                     | 23.3                                 | 35.7               | 37.1                                 | 42.7  | 39.8                                    | 8.2                                     |
| Third   | 4,002                | 27.6                                     | 19.7                                 | 23.1               | 24.6                                 | 31.3  | 34.1                                    | 28.7                                    |
| Top   | 20,348               | 17.3                                     | 8.2                                  | 13.3               | 12.5                                 | 17.6  | 18.3                                    | 41.8                                    |
| Sample mean   | 10,015               | 27.6                                     | 22.5                                 | 26.5               | 30.8                                 | 29.0  | 34.5                                    | 24.7                                    |
| Difference 1 <sup>st</sup> vs. 4 <sup>th</sup> quartile | -19,919 <sup>a</sup> | -18.1 <sup>a</sup>                       | -20.8 <sup>a</sup>                   | -33.1 <sup>a</sup> | -44.8 <sup>a</sup>                   | -21.4 <sup>a</sup>                          | -23.9 <sup>a</sup>                      | 38.7 <sup>a</sup>                       |
| Observations  | 185                  | 125                                      | 95                                   | 133                | 96                                   | 57  | 145                                     | 83                                      |

Note: <sup>a</sup> significant at the 1% level, <sup>b</sup> significant at the 5% level, and <sup>c</sup> significant at the 10% level.

**Table 2: Sales, Employment, Education of Managers, and Value Added of Informal and Formal Firms**

| Country          | Year | Sales    |         | Employment |        | % Top Manager College |        | Value Added / Employee |         |                 |
|------------------|------|----------|---------|------------|--------|-----------------------|--------|------------------------|---------|-----------------|
|                  |      | Informal | Formal  | Informal   | Formal | Informal              | Formal | Informal               | Formal  | Informal/Formal |
| Afghanistan      | 2009 | 61,791   | 102,900 | 9.60       | 32.15  | .                     | .      | 39,586                 | 73,839  | 54%             |
| Angola           | 2010 | 15,424   | 105,370 | 9.22       | 38.24  | .                     | 100%   | 10,152                 | 105,167 | 10%             |
| Argentina        | 2010 | 2,473    | 96,826  | 1.58       | 237.63 | .                     | .      | 1,956                  | 46,258  | 4%              |
| Bangladesh       | 2003 | 4,001    | 28,003  | 5.24       | 297.69 | 5%                    | 71%    | 1,583                  | 8,479   | 19%             |
| Botswana         | 2010 | 5,847    | 68,822  | 2.69       | 78.51  | .                     | 100%   | 4,416                  | 30,051  | 15%             |
| Brazil           | 2003 | 13,326   | 60,070  | 2.42       | 116.95 | 13%                   | 65%    | 8,261                  | 27,767  | 30%             |
| Burkina Faso     | 2009 | 38,491   | 164,114 | 1.23       | 88.91  | 4%                    | 100%   | 18,943                 | 140,846 | 13%             |
| Cambodia         | 2003 | 3,953    | 18,587  | 5.62       | 100.56 | 2%                    | 34%    | 2,400                  | 10,179  | 24%             |
| Cameroon         | 2009 | 16,138   | 72,641  | 1.63       | 106.10 | 10%                   | 100%   | 12,777                 | 50,153  | 25%             |
| Cape Verde       | 2006 | 9,163    | 20,965  | 2.23       | 18.35  | 9%                    | 33%    | 6,509                  | 9,192   | 71%             |
| Cape Verde       | 2009 | 40,387   | 54,489  | 0.91       | 57.73  | 4%                    | 100%   | 31,073                 | 49,365  | 63%             |
| Congo, Dem. Rep. | 2010 | 5,462    | 819,007 | 3.86       | 69.78  | .                     | 100%   | 3,967                  | 667,801 | 1%              |
| Egypt, Arab Rep. | 2008 | 4,897    | 65,308  | 4.12       | 238.57 | 0%                    | .      | 2,975                  | 24,840  | 12%             |
| Guatemala        | 2003 | 4,486    | 31,783  | 3.74       | 113.91 | 8%                    | 74%    | 2,127                  | 13,937  | 15%             |
| Guatemala        | 2010 | 3,357    | 93,875  | 1.47       | 154.34 | .                     | .      | 2,711                  | 41,570  | 7%              |
| India            | 2002 | 6,239    | 50,313  | 4.69       | 97.58  | 0%                    | 89%    | 3,175                  | 18,828  | 17%             |
| Indonesia        | 2003 | 5,147    | 42,220  | 3.79       | 587.16 | 0%                    | 64%    | 2,687                  | 19,083  | 14%             |
| Kenya            | 2003 | 6,620    | 102,615 | 3.51       | 148.63 | 6%                    | 71%    | 3,758                  | 33,781  | 11%             |
| Mali             | 2010 | 5,862    | 31,438  | 4.46       | 34.12  | .                     | 100%   | 4,072                  | 21,847  | 19%             |
| Nepal            | 2009 | .        | 64,464  | 6.00       | 41.63  | 20%                   | .      | .                      | 19,121  | .               |
| Niger            | 2005 | .        | 375,277 | 4.52       | 42.02  | 5%                    | 51%    | .                      | 349,967 | .               |
| Pakistan         | 2003 | 3,778    | 92,615  | 4.10       | 194.45 | 6%                    | 87%    | 2,471                  | 38,800  | 6%              |
| Peru             | 2010 | 7,461    | 100,155 | 2.29       | 205.58 | .                     | .      | 5,135                  | 45,430  | 11%             |
| Rwanda           | 2011 | 3,720    | 65,860  | 2.36       | 73.09  | .                     | 100%   | 1,290                  | 41,817  | 3%              |
| Senegal          | 2003 | 5,317    | 70,592  | 5.32       | 91.30  | 16%                   | 48%    | 3,298                  | 25,995  | 13%             |
| Tanzania         | 2003 | 1,807    | .       | 3.44       | 82.56  | 1%                    | 64%    | 1,055                  | .       | .               |
| Uganda           | 2003 | 6,538    | 53,576  | 4.58       | 71.38  | 19%                   | 34%    | 3,643                  | 22,289  | 16%             |
| Average          |      | 11,267   | 109,688 | 3.88       | 126.63 | 7%                    | 76%    | 7,201                  | 74,477  | 20%             |



**Table 3. Obstacles to Doing Business**

|   | Informal Survey | Enterprise Survey |        |       | Enterprise vs Informal |                     |
|---|-----------------|-------------------|--------|-------|------------------------|---------------------|
|   |                 | Small             | Medium | Big   |                        |                     |
| <b>Obstacles (% of firms identifying an obstacle as the most important)</b> |                 |                   |        |       |                        |                     |
| Access to Financing   | 43.8%           | 20.6%             | 17.8%  | 13.6% | 18.5%                  | -25.3% <sup>a</sup> |
| Political instability   | 11.4%           | 9.5%              | 9.1%   | 11.7% | 9.7%                   | -1.7%               |
| Access to Land  | 11.2%           | 5.6%              | 4.2%   | 4.1%  | 5.0%                   | -6.3% <sup>b</sup>  |
| Corruption  | 7.4%            | 7.3%              | 8.2%   | 6.0%  | 7.4%                   | 0.0%                |
| Electricity   | 7.3%            | 10.0%             | 9.8%   | 7.4%  | 9.8%                   | 2.5%                |
| Business licensing and permits  | 6.3%            | 2.3%              | 2.7%   | 1.7%  | 2.4%                   | -3.9% <sup>b</sup>  |
| Crime   | 3.4%            | 5.2%              | 5.0%   | 7.2%  | 5.4%                   | 2.0%                |
| Legal System  | 3.3%            | 0.5%              | 0.5%   | 1.9%  | 0.8%                   | -2.5% <sup>a</sup>  |
| Customs and Trade Regulations   | 2.1%            | 3.2%              | 4.4%   | 5.0%  | 3.8%                   | 1.8%                |
| Uneducated Workforce  | 1.8%            | 4.6%              | 6.0%   | 10.4% | 6.0%                   | 4.2% <sup>c</sup>   |
| Labor Regulations   | 1.8%            | 2.6%              | 3.1%   | 4.8%  | 3.3%                   | 1.4%                |
| Tax Administration  | 0.1%            | 4.3%              | 6.7%   | 6.4%  | 5.3%                   | 5.2% <sup>b</sup>   |
| Practices of competitors in the informal economy                            | 0.1%            | 14.4%             | 13.4%  | 9.9%  | 12.9%                  | 12.9% <sup>a</sup>  |
| Tax Rates   | 0.0%            | 7.7%              | 6.2%   | 6.3%  | 6.8%                   | 6.8% <sup>a</sup>   |
| Transportation  | 0.0%            | 2.2%              | 2.9%   | 3.7%  | 2.8%                   | 2.8% <sup>a</sup>   |

Notes: <sup>a</sup> significant at the 1% level. <sup>b</sup> significant at the 5% level. <sup>c</sup> significant at the 10% level.

**Table 4: Costs and benefits of registering**

Percentage of Informal Survey respondents rating the following as either the most important or second most important benefit that their firm could obtain from registering

|                     | Better access to financing | Better access to raw materials | Better access to markets | Less bribes to pay | Better opportunities with formal firms | More access to government programs or services | Better legal foundations on the property | Better access to infrastructure service |
|---------------------|----------------------------|--------------------------------|--------------------------|--------------------|--|--|--|---|
| Angola 2010         | 71%                        | 36%                            | 8%                       | 9%                 | 3%                                     | 2%   | 13%                                      | 2%                                      |
| Burkina Faso 2009   | 63%                        | 27%                            | 13%                      | 26%                | 5%                                     | 8%   | 3%                                       | 2%                                      |
| Botswana 2010       | 100%                       | 1%                             | 18%                      | 1%                 | 9%                                     | 7%   | 2%                                       | 7%                                      |
| Cameroon 2009       | 67%                        | 39%                            | 18%                      | 33%                | 13%                                    | 2%   | 7%                                       | 2%                                      |
| Congo, Dem Rep 2010 | 70%                        | 21%                            | 21%                      | 11%                | 10%                                    | 2%   | 3%                                       | 7%                                      |
| Capo Verde 2009     | 70%                        | 32%                            | 14%                      | 15%                | 10%                                    | 1%   | 3%                                       | 0%                                      |
| Mauritius 2009      | 67%                        | 25%                            | 14%                      | 16%                | 3%                                     | 9%   | 10%                                      | 6%                                      |
| Madagascar 2009     | 72%                        | 46%                            | 17%                      | 2%                 | 15%                                    | 9%   | 6%                                       | 4%                                      |
| Mali 2010           | 84%                        | 33%                            | 14%                      | 26%                | 3%                                     | 3%   | 2%                                       | 0%                                      |
| Nepal 2009          | 64%                        | 6%                             | 4%                       | 0%                 | 10%                                    | 12%  | 4%                                       | 0%                                      |
| Average             | 73%                        | 27%                            | 14%                      | 14%                | 8%                                     | 5%   | 5%                                       | 3%                                      |

**Table 5: Regional Human Capital, the size of establishments, and participation in the economy**

The table reports fixed effect regressions for for the following three dependent variables: (1) logarithm of the number of employees per establishment; (3) logarithm of the number of employees per capita; and (4) logarithm of the number of employees working in firms that employ at least 100 employees as a percent of total employment. All regressions include the number of years of education. All variables are described in Table 2

|                                  | Dependent Variable:              |                                 |                                  |                                   |
|----------------------------------|----------------------------------|---------------------------------|----------------------------------|-----------------------------------|
|                                  | Ln(Establishments/Population)    | Ln(Employees/Establishments)    | Ln(Employees/Population)         | Ln(Employees Big Firms/Employees) |
| Years of Education in the Region | 0.2967 <sup>a</sup><br>(0.0314)  | 0.1233 <sup>a</sup><br>(0.0227) | 0.3418 <sup>a</sup><br>(0.0273)  | 0.2445 <sup>a</sup><br>(0.0374)   |
| Constant                         | -5.8626 <sup>a</sup><br>(0.2571) | 0.8855 <sup>a</sup><br>(0.2093) | -4.3992 <sup>a</sup><br>(0.2119) | -3.6568 <sup>a</sup><br>(0.4299)  |
| Observations                     | 951                              | 983                             | 988                              | 501                               |
| Adjusted R <sup>2</sup>          | 92%                              | 83%                             | 94%                              | 95%                               |
| Country Fixed Effects            | Yes                              | Yes                             | Yes                              | Yes                               |

Note: a = significant at the 1% level, b = significant at the 5% level, and c = significant at the 10% level.