

Education and the Structure of Informal Firms in Latin America

Mohammad Amin

A recent survey of unregistered or informal firms in Argentina and Peru shows that about 74 percent of the owners have a secondary or higher education. This note compares firms by the education level of the owners to assess how education affects the structure, conduct and performance of informal firms. The results show a limited impact of education. Firm-efficiency as measured by sales per worker rises sharply with the level of education of the owner and the same holds for firm-size as measured by monthly sales or employment. Firms with relatively more educated owners are more likely to use external sources of finance, cell phones and in some cases show greater inclination to register, work on contract basis and maintain business accounts separate from household accounts. However, in other dimensions—such as the use of machinery and vehicles—there is no significant difference between firms by the education level of the owner of the firm.

Introduction

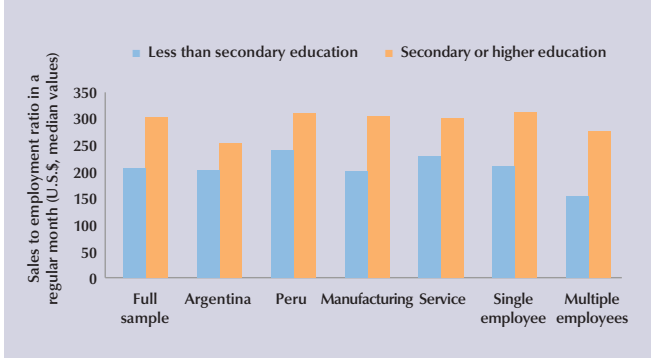
There is a vast literature dealing with the impact of human capital or the level of education on economic development (see, for example, Barro 1991 and Benhabib and Spiegel 1994). Almost all of this literature focuses on the formal or the registered sector. However, a large proportion of economic activity occurs in the informal or the unregistered economy. For example, a recent study estimates that, for the world as a whole, between 23 percent and 35 percent of all economic activity occurs in the informal economy; for countries in the lowest quartile of GDP per capita, the estimates range between 29 percent and 57 percent (La Porta and Shleifer 2008). Studies that explore the education-informality nexus are largely focused on how the level of education affects an individual's decision to participate in the formal vs. the informal economy (see, for example, Pisani and Pagan 2004).

This note uses recently collected data on informal or unregistered firms in Argentina and Peru to shed some light on how the education level of the owner of the firm affects the performance and structure of the firm. The data were collected by the World Bank's Enterprise Analysis Unit in 2010 and cover 384 firms in Argentina

and 480 firms in Peru.¹ Firms were randomly selected from two cities in Argentina (Buenos Aires and Rosario) and two cities in Peru (Lima and Arequipa). It is important to note that due to lack of proper sampling frames, these surveys are not necessarily representative of the informal economy at the country or even the city level. Hence, the results presented below pertain to the structure of the firms surveyed rather than the informal economy per se.

Throughout this note, the focus is on the level of education of the largest shareholder (owner for short) of the firm. Without much loss of generality, a firm-owner is considered to be highly educated if he or she attended secondary school or undertook vocational training or university training. The remaining individuals, the less educated, include those with either primary or no education. In the full sample, 74 percent of the firms have highly educated owners. The figure varies between 59 percent in Argentina and 85 percent in Peru. The results continue to hold if the owners in the highly educated category were divided into those with secondary education (50 percent in the full sample) and those with more than secondary education (24 percent in the full sample).² Unless otherwise mentioned, all differences discussed below are statistically significant.³

Figure 1 Labor productivity is higher for firms with more educated owners



Source: Enterprise Surveys.

Labor productivity is higher among the more educated

Labor productivity is a commonly used measure of the level of efficiency of a firm. It equals total sales of a firm in a regular month (in U.S. dollars) divided by the total number of workers employed by the firm in a regular month. It is plausible that the more educated owners would have better managerial abilities, knowledge of the markets and business opportunities. Hence, labor productivity may be higher in firms with more educated owners. The data do not reject this hypothesis either in the full sample or in various sub-samples (figure 1).

It is possible that the difference in labor productivity between firms with more or less educated owners could be due to other related differences such as the use of machines and vehicles, firm-size as measured by the number of employees, age of the firm, years of managerial experience, gender of the largest owner, age of the largest owner, whether the firm operates from inside or outside of household premises, desegregated sector-specific factors (20 sectors within manufacturing and services) and country-specific factors. However, closer examination shows that these factors explain at most 49 percent of the gap in labor productivity by education level of the owner.

Firm-size increases with the level of education of the owner

It is well-known that informal firms operate at a very small scale which makes it difficult for them to exploit economies of scale in specialization, innovation and investment in fixed capital. Without an increase in the scale of operation, a dynamic and vibrant informal sector is almost impossible. The sample under study confirms that the scale of operation rises with the education of the owner. The median value of total sales in a regular month is U.S. \$387 for firms with highly-educated owners and a much lower U.S. \$258 for the rest. This difference

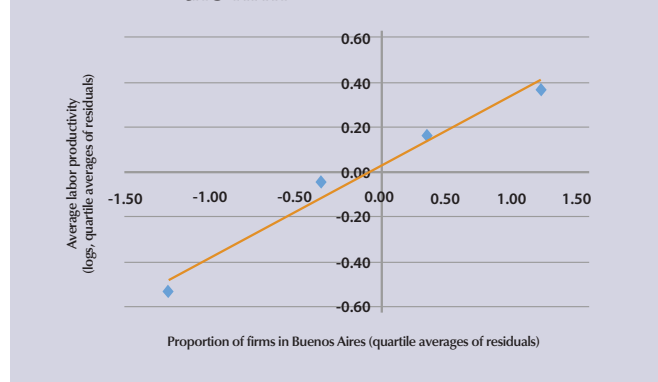
holds within the various sub-samples shown in figure 1. Commonly observed factors such as the use of machines and vehicles, age of the firm, years of managerial experience, gender of the largest owner, age of the largest owner, whether the firm operates from inside or outside of household premises, whether corruption and crime are severe obstacles to doing business, disaggregated sector-specific factors and country-specific factors cannot fully explain the positive relationship between monthly sales and the level of education (figure 2).

The relationship between scale of operation and education discussed above also holds for the number of employees as the measure of firm-size, although in this case the relationship is somewhat weak within Argentina.

Younger entrepreneurs are more likely to have higher education

Due to ongoing economic progress, the proportion of the highly educated in a country tends to rise over time. However, it is not clear that the share of the more educated

Figure 2 Even a large number of observable factors cannot fully explain why monthly sales increase with the level of education of the owner of the firm



Source: Enterprise Surveys.

The figure is a partial scatter plot of the quarterly average residual values of total sales in a regular month (log values) against the residuals of the dummy variable equal to 1 if the owner has secondary or higher education and 0 otherwise. The residuals are obtained from the regression of sales (logs) and education dummy variable on the following variables: dummy indicating if a firm uses machinery, dummy indicating if a firm uses vehicles, age of the firm (logs), years of managerial experience (logs), gender of the largest owner, age of the largest owner (logs), dummy indicating whether the firm operates from inside or outside of household premises, dummy indicating if corruption is a severe obstacle to doing business and a similar dummy for crime, dummy variables for the sector (20 sectors) and a dummy for the country. The positive relationship shown is statistically significant at the 5 percent level with Huber-White robust standard errors.

increases proportionately within the informal sector as well. For example, with economic progress, the more educated may increasingly prefer the formal over the informal sector leading to a decline in the proportion of the highly educated within the informal sector.

The data suggest that the proportion of the highly educated in the informal sector increases over time. That is, the median age of the firm-owners in the sample is 43 years. For the sample of firms with owners younger than the median age, 86 percent have owners with secondary or higher education. For firms with owners above the median age, only 61 percent have secondary education or higher. This percentage difference holds within various sub-samples and is robust to a number of differences in firm-characteristics.

Owners with higher education are more likely to have parents who own a business and have higher education

About 86 percent of firm-owners are highly educated if either of their parents has a secondary or higher education, while only 66 percent of firm-owners are highly educated if both of their parents have less than a secondary education. The positive relationship between parental and own education for the firm-owners is robust to various sub-samples and controls.

It is possible that individuals who own their businesses generate higher income than those working on wages. Since higher income levels are typically associated with greater desire to educate children, a positive relationship between owning a business and children's education level can be expected. The data do not reject this possibility. For firm-owners who have parents with their own business (currently or in the past), 83 percent have secondary or higher education. The corresponding figure for the set of remaining firm-owners is much lower at 71 percent.

The more educated show a greater willingness to register

It is commonly believed that bringing the informal firms within the fold of the formal or registered sector can have numerous beneficial effects for the economy. However, the transition from the informal to the formal sector is not well understood. The data reveal that such a transition is more attractive for firms with highly educated owners than the rest. That is, 49 percent of the highly educated compared with only 36 percent of the rest show a willingness to register.⁴ It is confirmed in the data that this difference in the willingness to register by the level of education cannot be explained away by differences in firm characteristics such as sector of

activity (20 disaggregated sectors), country of location, age of the firm, gender of the largest owner, location of the firm inside vs. outside household premises, hours of normal operation in a given week, whether the firm uses machinery and vehicles or not and firm-size measured by the number of employees in a regular month. However, when one takes into account differences in the age of the owner or in firm-size as measured by monthly sales, the positive relationship between education and willingness to register becomes weak. Hence, it is difficult to say whether it is education per se, firm-size or the lower age of the more educated that drives the greater willingness to register.

With the exception of cell phones, the use of equipment, such as machinery and vehicles, does not increase with the level of education

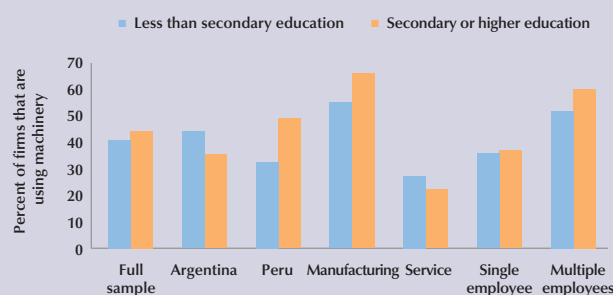
Is there a complementarity between human capital and use of physical capital such as machines, cell phones and vehicles? The data do not support such complementarity, except in the case of cell phones. The more educated are much more likely to use machines in Peru but not in the full sample (figure 3). The percentage of firms that use vehicles for business activity is roughly the same irrespective of the level of education of the owner and this holds within various sub-samples, including Peru and Argentina. For cell phones, however, 28 percent of the firms with owners having less than secondary education compared with 53 percent of the firms with highly educated owners use a cell phone. This large percentage difference holds within various sub-samples.

Use of external sources of funds is more common among the more educated

A number of studies suggest that access to finance improves with the level of education of the individual. The data show mixed results. The percentage of firms that use an external source to finance the day-to-day operations is larger among firms with a highly educated owner than the rest (27 percent vs. 14 percent). Similarly, the percentage of firms that use their own or internal funds to finance their day-to-day operations is lower among firms with highly educated owners vs. the rest (77 percent vs. 87 percent). While these percentage differences are significant and large in the full sample, they are weak within Argentina and Peru. Hence, it is difficult to say whether it is education level per se or other country-specific factors that are responsible for the observed relationship between education level and the sources of finance.

The data suggest that the proportion of the highly educated in the informal sector increases over time.

Figure 3 There is little complementarity between human capital and machinery



Source: Enterprise Surveys.

Some results are specific to the country and the sector to which a firm belongs

There are a number of differences between firms by the level of education of the owner that are specific to Argentina and Peru and to the manufacturing and service sectors. This is not too surprising. Given little sunk cost and small scale of operation, informal firms are likely to adapt to the local conditions at the country and the sector level. For example, in Peru, 23 percent of the firms with highly educated owners produce or sell under a written contract compared with only 10 percent of the firms with owners having less than secondary education. In contrast, the corresponding figures for Argentina are roughly equal to one another (53 percent vs. 48 percent, respectively). Another example relates to the cost of registering as perceived by the firms. In the manufacturing sector, close to 19 percent of the firms that have a highly educated owner perceive inspections and required meetings with government officials as a severe obstacle to registering, while in manufacturing firms with owners having less than secondary education, the corresponding figure is much higher at 29 percent. Conversely, in the service sector, these percentages hardly differ from one another (21 percent vs. 21 percent, respectively).

Conclusion

This note sheds light on how the level of education of the entrepreneur affects the structure and performance of an informal firm in Argentina and Peru. Firm-efficiency and firm-size tend to increase with the education level of the firm-owner. Younger entrepreneurs tend to be more educated, reflecting the broader trend toward increasing literacy and human capital with overall economic development. Other differences—such as tendency to use external vs. internal sources of funds, willingness to register and contract-based work—are also related to the education level of the entrepreneur, although in these cases more work is required to ascertain or reject them as robust findings.

Notes

1. The Enterprise and Informal Surveys implemented in Latin America and Caribbean countries, are jointly conducted by the World Bank and the Inter-American Development Bank for this geographic region.
2. That is, how firm characteristics change across various education categories on average is qualitatively similar whether those with secondary and more than secondary education are grouped into one category or not.
3. That is, the differences are statistically significant at the 5 percent level. The significance level is obtained through appropriate regression analysis with Huber-White robust standard errors.
4. The greater inclination among firms having more educated owners to register holds within Argentina and Peru. However, it does not hold when looking at the sample of service firms alone.

References

- Barro, R. J. 1991. "Economic Growth in a Cross Section of Countries." *Quarterly Journal of Economics* 106(2): 407-43.
- Benhabib, J. and M. Spiegel. 1994. "The Role of Human Capital in Economic Development: Evidence from Aggregate Cross-Country Data." *Journal of Monetary Economics* 34(2): 143-74.
- La Porta, R. and A. Shleifer. 2008. "The Unofficial Economy and Economic Development." Tuck School of Business Working Paper No. 2009-57.
- Pisani, M. J. and J. A. Pagan. 2004. "Sectoral Selection and Informality: A Nicaraguan Case Study." *Review of Development Economics* 8(4): 541-556.

The Enterprise Note Series presents short research reports to encourage the exchange of ideas on business environment issues. The notes present evidence on the relationship between government policies and the ability of businesses to create wealth. The notes carry the names of the authors and should be cited accordingly. The findings, interpretations, and conclusions expressed in this note are entirely those of the authors. They do not necessarily represent the views of the International Bank for Reconstruction and Development/World Bank and its affiliated organizations, or those of the Executive Directors of the World Bank or the governments they represent.



THE WORLD BANK



International Finance Corporation
World Bank Group