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Stylized Facts from the Enterprise Survey

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Abstract[1]

This paper describes the share of investment in fixed capital and working capital financed by retained earnings using a harmonized dataset from the World Bank Enterprise Survey. The sample includes firms across countries in Latin America and the Caribbean. Descriptive statistics are presented for the share of purchases of fixed assets financed with internal funds or retained earnings, the share of working capital financed with internal funds, the ratio between internal funds used for purchasing fixed assets and sales, and annual purchases of fixed assets (as a proportion of annual sales). Also presented are stylized facts exploring how these variables differ by country, firm size, firm age, registration, sector of activity, and ownership. It is found that internal funds are extensively used to finance both purchases of fixed assets and working capital, particularly by smaller firms located in countries with less developed financial markets. Investment in fixed assets represents about 7.5 percent of sales in the region and is significantly higher among larger and registered firms.

JEL classifications: D22, G32, E21, E22
Keywords: Investment financing, Retained earnings

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1. Introduction

Rapid and sustained growth is often perceived as a necessary macroeconomic condition for long-term development.[2] Such growth is usually linked to an increase in productivity, the latter being associated with technical change. In turn, technological innovation is usually embodied in new fixed capital goods, making investment a key variable in fostering growth. Nonetheless, investment needs appropriate financing channels to avoid inefficiently high costs of funding. Thus, how investment is financed becomes an important issue in the growth process.

At the macroeconomic level, high savings seem a necessary condition for obtaining relatively low-cost-of-funding investment. In this regard the contribution of firms to aggregate savings may not be trivial. Bebczuk and Cavallo (2014), constructing an unbalanced panel dataset of 64 countries in the 1990-2012 period, have shown that, on the one hand, more than half of national savings belong to firms, and, on the other, that countries where firms save more also present higher levels of investment.

This piece of evidence motivates more micro-oriented empirical studies of the behavior of firm investment and its funding. In part, such studies should focus on the role of savings (retained earnings) in financing fixed-capital investment at the firm level. Conceptually, the possibility of this savings-investment correlation starts from the well-known pecking order theory[3] from corporate finance. This theory states that, when managers possess an informational advantage over possible fund providers from outside the firm, then that information asymmetry tends to make internal funding cheaper than outside finance. Asymmetric information is perceived to be present in all financial systems (even in OECD countries). Of course, the severity of that asymmetry may be higher in countries with worse corporate governance practices and less protection for investors (i.e., more opaque firms). Emerging Market countries, including those in Latin America and the Caribbean, include many examples of such bad corporate governance countries. Yet, even within each of those countries with average low investor-protection quality there may exist high heterogeneity across firms, associated with heterogeneous levels of transparency and governance quality across companies. The focus on micro data would then look

[2] See, for example, the overview chapter of Commission on Growth and Development (2008).

[3] Myers and Majluf (1984) was the seminal paper presenting the first theoretical model of this literature. The latter is also linked to asymmetric-information theories of dividend distribution and announcements by corporations (e.g., Easterbrook, 1984; Miller and Rock, 1985; Jensen, 1986; Dybvig and Zender, 1991; Persons, 1994; and Sig Yoon and Starks, 1995, among others), as well as other asymmetric-information theories of corporate control (e.g., Jensen, 1986). For surveys on these related issues see Shleifer and Vishny (1997) and Tirole (2005).

for a deeper understanding of the degree of heterogeneity of dependence of investment on internal funds across firms and whether that heterogeneity is at least correlated with certain observable variables.

This paper presents stylized facts on how firms finance investment in fixed capital and working capital in Latin American and Caribbean (LAC) countries, focusing on the role of internal funds. To our knowledge, there has been very little empirical work documenting those facts or related issues (such as retained earnings behavior) for non-OECD countries, with the few exceptions noted below. Furthermore, the scarcity of academic research on such issues is due to the difficulties in finding harmonized databases covering both formal and informal firms.

This paper contributes to that literature by providing a throughout description of firm-level investment reliance on retained earnings, working capital reliance on that same variable and retained-earnings-to-sales behavior using a harmonized dataset, i.e., the World Bank Enterprise Survey (WBES) across more than 20 countries in Latin America and the Caribbean. This survey is the only dataset containing worldwide information on various variables (including performance variables, fixed asset purchases and working capital financing) of individual firms (a large proportion of which are small or medium non-public enterprises). The paper presents stylized facts of those variables correlated to firm size, access to credit indicators, sector of activity and formality/informality status (information also included in the survey).

The main results of this paper are as follows. For registered firms, first, the per-country empirical distribution of the share of fixed-assets investment financed with internal funds presents a twisted U-shaped curve for all Latin American and Caribbean countries, the mode of that distribution being one. The latter means that the most frequent case found in each LAC country is that of a firm whose capital investment is entirely financed internally. The empirical distribution of the working capital financed by internal funds is also U-shaped for several South American and Central American countries but not for Caribbean ones. However, overall, this first basic fact shows indeed that the financing structure of firms in LAC is far from being irrelevant, as the traditional Modigliani-Miller theorem predicts,[4] which is consistent with the abovementioned pecking-order, asymmetric-information types of capital structure theories.

[4] Incidentally, such empirical distributions are consistent with the evidence from corporate data from all over the world. For example, a well-known paper by Mayer (1990) shows that in three major OECD countries (the United States, the United Kingdom and Germany) the largest share of financing sources in the period 1970-1985 came from

When comparing the average share of investment financed by retained earnings for registered firms between LAC and selected OECD countries, it turns out that there are essentially no differences between those two groups of firms. Indeed, LAC-registered firms' average reliance of investment on internal funds is 57.58 percent, while for OECD firms it is 59.45 percent. Given the negative perception of investor protection conditions and the higher ownership concentration observed in LAC (see, e.g., La Porta et al., 1998, and Chong and López-de-Silanes, 2007) this result may seem surprising. However, it is not inconsistent with results of the findings of a recent empirical literature comparing leverage levels between LAC and OECD public firms (Aygarari, Demirgüç-Kunt and Maksimovic, 2010, and Céspedes, González and Molina, 2010).

A second set of results shows that smaller registered firms rely more on internal funds for investment than their bigger counterparts. Differences of investment financing behavior across different sizes are statistically significant, though economically not very large. For example, for firms of five employees or less the share of fixed-assets investment financed with internal funds reaches 68.7 percent, while for firms between 50 and 100 employees that share falls to 54.9 percent. On the other hand, the share of working capital financed by retained earnings ranges from 66.3 percent (for firms with less than five employees) down to 54.1 percent (for firms with between 51 and 100 employees).

Other results include the fact that age does not negatively correlate with the share of both fixed-asset investment and working capital financed by retained earnings for registered firms. Actually, regressions show a very weak (i.e., statistically significant but economically small) *positive* correlation between age and the share of fixed-asset investment financed with retained earnings. Also, registered firms in the manufacturing sector present lower values for the share of both fixed-asset investment and working capital financed with internal funds. On the other hand, single-owner registered firms present higher values for both ratios.

For unregistered firms the available data are even more limited. For the case of LAC countries, the survey only includes information for firms in Argentina, Guatemala and Peru. Also, the survey for unregistered firms contains only qualitative information (i.e., whether each firm uses or does not use a particular source of funding for each purpose) regarding financing of

retained earnings. In the case of the United States the share reached 66.9 percent, compared to 55.2 percent in Germany and 72 percent in the United Kingdom.

both fixed-assets purchases and working capital. For such firms, then, the first salient fact is the high proportion of firms *reporting* financing fixed-asset investment and working capital with retained earnings. In the first case, the share goes from a lower bound of 80 percent up to 97.6 percent, while for the second use the share goes from 80 percent up to 87 percent. As for registered firms, the share of firms using retained earnings for those two purposes does not change with age. Also, unregistered firms do invest less than registered counterparts.

A somewhat high dependence of investment on fixed assets and working capital on retained earnings is often interpreted as a signal of costly access to credit by the firm. The WBES dataset contains two questions related to credit constraints, one showing the availability of a credit line for the firm, the other stating whether access to finance is a major obstacle for operation and growth. Thus, the paper uses the country-average answers to each of those two questions to correlate them with the per-country reliance of investment and working capital financed on retained earnings. When considering formal firms, the country average share of fixed capital purchases and working capital financed by internal funds is negatively correlated with the share of firms with a credit line available. Yet, there is no conclusive signed correlation of each of those indicators of internal-funds reliance with the more subjective measure of credit constraints. The same non-conclusive correlation for both credit-constraint indicators holds for informal firms.

This paper also presents facts about reported purchases in fixed assets (investment) scaled by sales. Registered LAC firms on average invest more than their unregistered counterparts, suggesting that the latter are either too constrained to implement larger investment projects that would allow them to grow, or otherwise they do not spend on investment to avoid being monitored by regulators and tax authorities. Also, there is a large dispersion across countries for registered firms. While Brazil is the country with the highest average investment-to-sales ratio (equal to 13 percent) countries like Mexico present an average as low as 3 percent.[5] Also, investment seems to be positively correlated with size (for registered firms at least), while investment decays dramatically for firms being two years old or older. Thus, this variable seems to be capturing expenses that may include necessary set-up investments to keep business operational.

[5] However, those values are still higher than the average investment-to-sales ratio for unregistered LAC firms in the sample (about 1 percent).

As stated above, there are few papers that have analyzed different aspects of investment and working capital financing of small and medium firms. All of those papers use older versions of the WBES. One of the few papers in the literature closest to the one here is Chavis, Klapper and Love (2011). That paper also uses data from WBES to focus on the analysis of financing patterns of young firms. From a panel dataset including about 70,000 firms in 104 countries between 1999 and 2006 that paper finds that more than 80 percent of those firms use retained earnings as one financing source for investment and working capital, which is consistent with the findings in this paper. More importantly, the authors find that about an average of 60 percent of the financing of firm-level investment and working capital comes from retained earnings, which is slightly above the average for LAC firms in our paper. The paper further shows that such reliance on retained earnings is decreasing with age, in contrast to results here. On the other hand, the authors do not include data from the 2010 wave of the survey (which our paper does), which also focus mostly on financing sources different from retained earnings (such as bank-related or informal sources).

The second paper related to ours is Zhao, Tan and Yao (2012). That paper uses data for years between 1992 and 2009 to compare the share of investment financed by retained earnings between market-based economies and bank-based economies Their main result is that small firms rely significantly less on retained earnings for their fixed-asset purchases in market-based economies relative to those in bank-based economies. Although the focus in this paper is very different, some facts from that paper can be compared to ours. In Zhao, Tan and Yao (2012), the worldwide average share of investment financed with retained earnings is 43.69 percent, below the average found for LAC registered firms in our study. On the other hand, they find that such reliance on internal funds is increasing in firm age, coinciding with the correlation found in this paper.

The other paper related to ours is Figueroa and Wagner (2014). They also use the same WBES database, although with a different goal. Their paper focuses on the behavior of the ratio between retained earnings and operational profits, constructed as the ratio between the reported reinvested retained earnings over purchases of fixed assets (used here) divided by the ratio of fixed asset purchases to operational profits. For this purpose they actually need to construct a proxy for operational profits from the reported answers of different questions related to operation

costs.[6] They find that this ratio is indeed higher for younger firms and also for firms who faced rejected loans or who did not apply for loans, i.e., for more "credit-constrained" companies. This paper, instead, computes the retained earnings used to finance investment divided by firm sales (not by profits). The latter has essentially no correlation with firm age. However, this paper also finds a lower dependence of investment on retained earnings for firms who actually have access to a line of credit, the latter being consistent with Figueroa and Wagner's (2014) result on the correlation between the retained-earnings-to-operational-profits ratio and loan rejection or loan non-application.

Other papers, using WBES data to analyze different channels of investment and working capital financing, focus on more specific (but relevant) countries. For example, the paper by Ayyagari, Dermigüç-Kunt and Maksimovic (2010) focuses on the informal channels of financing in China.[7] Using data from the year 2003, that paper presents a description of financing patterns comparing Chinese companies with firms in other continents. In that comparison, the average LAC firm presents a fixed-capital-purchases-to-retained-earnings equal to 53.96 percent, which is of course very close to the average obtained in this paper. Remarkably, LAC firm-average reliance on retained earnings for investment is the second lowest across continents.[8]

Some of the facts arising from the results of this paper may be rationalizable using some of the theoretical and quantitative works aiming at endogeneizing the financial structure of companies. Some of those papers attribute such reliance on internal funds to the presence of borrowing constraints due to asymmetric information (e.g., Clementi and Hopenhayn, 2006), agency costs (such as De Marzo et al., 2012) or more general transaction costs of external funding (see, e.g., Gomes, 2001; Henessy and Whited, 2007; Riddick and Whited, 2009; Bolton, Chen and Wang, 2011; and Arellano, Bai and Zhang, 2012, among others). Yet, some of the facts from this paper (such as correlation with firm age) are harder to rationalize with that literature.

Incidentally, the country-wide correlation between the reliance of investment and working capital on internal funds and the share of firms with available credit lines is reminiscent

[6] This procedure may lead to severe measurement error problems. See footnote 15 for details.

[7] Another paper using WBES data to analyze financing patterns for small and medium businesses in China is Allen, Qian and Xie (2013). That paper uses only the Chinese branch of the WBES to focus on determinants of what they define as informal finance. However that paper does not compare those determinants in Chinese firms with other countries' firms.

[8] Yet, the paper also shows that China presents an extraordinary low reliance of investment on retained earnings, with a country-wide average of 15.24 percent.

of the traditional empirical literature on credit constraint based on the seminal work by Fazzari, Hubbard and Petersen (1988), followed up by a long stream of empirical papers.[9] The latter found a statistically significant positive investment-to-cash-flow coefficient from estimated reduced-form equation regressions. However, a more recent literature relying on dynamic models of investment,[10] and whose empirical predictions include Euler-equation based tests,[11] as well as the above-mentioned more recent theoretical literature, show that the empirical result from Fazzari, Hubbard and Petersen (1988) and others may be misleading, given measurement error in regressors as well as other endogeneity issues.

The paper is organized as follows. The next section presents and briefly describes the Enterprise Survey database, discussing the limitations to measure corporate savings and investment. Section 3 presents a number of stylized facts from the directly reported reliance on internal funds for two main uses: purchase of fixed capital and for working capital. It also presents those ratios correlated to several firm and country characteristics for both registered and non-registered companies. Section 4 presents facts on investment in fixed capital for both registered and unregistered firms. Section 5 presents concluding remarks, with some comments about policy implications.

2. Data and Variables: The World Bank Enterprise Surveys

This paper uses the World Bank Enterprise Survey (WBES) dataset. It is a firm-level survey answered by business owners and top managers. Typically, the sample includes 1,200 to 1,800 firms in larger economies, 360 firms in medium-sized economies, and 150 in small economies. Firms are selected using a stratified random sample among registered firms.[12] The survey has been conducted in almost every country in the world, and in some countries more than once. This paper includes data from years 2006, 2009 and 2010 mostly. Although data from WBES have been available since 1992, only recently has the survey systematically included information on LAC firms. Appendix 1 lists the year in which the survey was conducted in Latin American and Caribbean countries as well as the number of firms in the sample and their size. The sample

[9] For a more recent example (although using a GMM approach instead of OLS) for the Chinese case see Guariglia, Liu and Song (2011).
[10] The seminal theoretical work goes back to Lucas and Prescott (1971). A traditional survey of this literature can be seen, e.g., in Dixit and Pindick (1994).
[11] See Hayashi (1982) and, especially, Whited (1992, 2006).
[12] A full description of the data is available at http://www.enterprisesurveys.org/Methodology.

includes a total of 27,572 registered firms in the region, and this is the sample we use in the paper unless otherwise noticed. This information, given the harmonized nature of the datasets, provides a useful description of corporate savings in the region.[13]

The Formal Enterprise Survey includes the following questions:

Over the last complete fiscal year, please estimate the proportion of this establishment's total purchase of fixed assets that was financed from each of the following sources:

- *Internal funds or retained earnings*
- *Owners' contribution or issued new equity shares*
- *Borrowed from banks*
- *Borrowed from non-bank financial institution*
- *Purchases on credit from suppliers and advances from customers*
- *Others*

The same question is asked regarding working capital. The first step of this paper is to analyze both variables separately.

The WBES questionnaire for formal firms additionally asks about the amount spent on purchases of fixed assets during the last complete fiscal year, where fixed assets include land, buildings, machinery, vehicles and equipment. The questionnaire also asks about total sales during the last year. The following step is to use this information on firm's sales, expenditure on fixed assets and the use of internal funds to finance fixed assets to construct a measure of internal funds over sales. This variable has a number of shortcomings, as discussed below.[14]

One of the ultimate goals of this paper is to explore how the use of internal funds and retained earnings varies across firms' characteristics. The question about use of internal funds to finance working capital was asked of all firms in the sample, and the response rate was high (26,413 out of 27,572 registered firms). However, the question about the use of internal funds to finance purchases of fixed assets was only asked of those that effectively did purchase some

[13] An important limitation of the Enterprise Survey is that it tends to truncate the population of firms from below, particularly in developing countries (see Li and Rama, 2015).

[14] It would be reasonable to use "profits" instead of sales to scale this variable or investment (as also measured below in Section 4). The main reason of not doing so is that there is no question on direct reports of profits from WBES. Some papers, such as Figueroa and Wagner (2014), intend to reconstruct a measure of profits from labor costs, raw materials and input costs, several utility service costs and rental. We think that, although such a measure may constitute a possible proxy for profits, it is clearly affected by several measurement error sources, mainly given by those associated to the reports of each of the cost items used to subtract from the reported sale revenues. Our criterion has been to avoid such measurement error by using sales as the scaling variable.

fixed assets during the previous year, and therefore it is only available for 15,475 registered firms, out of which only 10,805 provide data on both expenditure on fixed assets and annual sales. Therefore, the measure of internal funds over sales is available for a relatively small sample. But that is not the only problem with this variable. Retained earnings could be used for other sources beyond purchases of fixed assets, such as working capital. However, because the dataset provides no information about the monetary value of working capital, we cannot measure it. Therefore, the measure of internal funds over sales only includes those internal funds used for purchases of fixed assets.

An interesting feature of the WBES dataset is that, for some countries, an informal firm-level survey was also conducted covering non-registered firms. In Latin America, the informal survey was conducted only in Argentina, Guatemala and Peru, all for the year 2010. The WBES for informal firms also includes two questions on sources of financing purchases of fixed assets and working capital. But instead of asking the *share* financed with each source, the questionnaire only asks whether that source was used or not. This makes it impossible to compute quantitative measures of dependence on retained earnings. It also imposes strong constraints on the reliance of investment and working capital on internal funds for informal firms (see Section 3.3 below for this discussion).

The WBES for informal firms also asks about purchases of fixed assets and sales, but using a different period. The question on purchases of fixed assets refers to the previous three years, and the question on sales refers to "a regular month."

3. Results: Financing Fixed-Capital Investment and Working Capital with Internal Funds

3.1. Use of Internal Funds among Registered Firms

Figures 1 and 2 present the histogram for the share of fixed assets and of working capital financed with internal funds or retained earnings. In both cases the histogram presents a clear U shape, with a higher peak on the right end indicating that approximately 40 percent of firms exclusively use internal funds or retained earnings to finance their purchases of fixed assets and their working capital. The same U shape is observed for each firm size category and in the sample of OECD firms (see Figures A2.1 and A2.2 in Appendix 2).

Figure 1. Histogram of Share of Fixed Assets Financed with Internal Funds or Retained Earnings, LAC

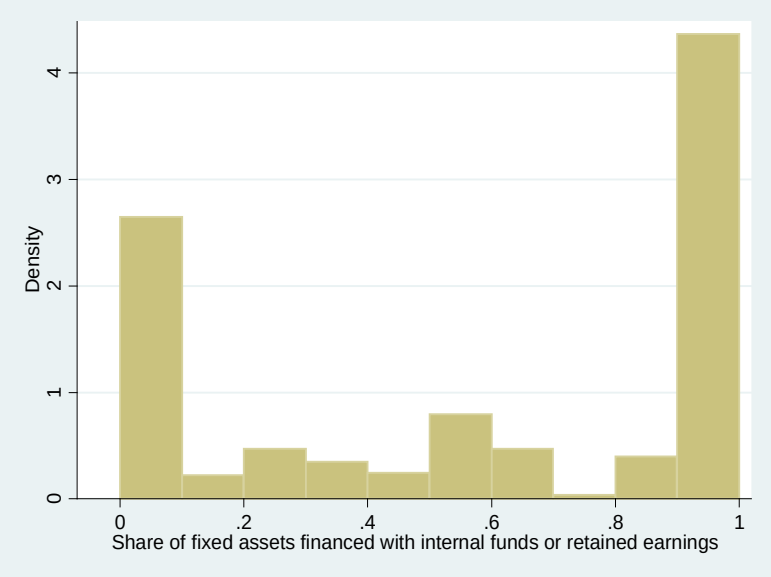
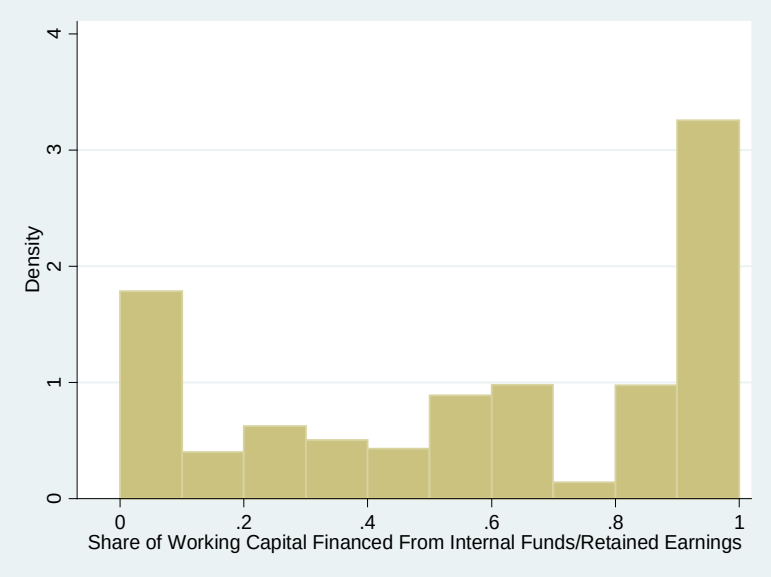


Figure 2. Histogram of Share of Working Capital Financed with Internal Funds or Retained Earnings, LAC



Figures A2.3 and A2.4 in Appendix present the histograms by country. Every country in LAC presents the U shape histogram with respect to the use of internal funds to finance fixed assets. However, the use of internal funds to finance working capital has a U shape in countries in South and Central America but not in the Caribbean.

The histogram for the third variable (i.e., retained earnings used for purchases of fixed assets over sales) is in Figure 3. Approximately 90 percent of the firms in LAC countries allocate a level of retained earnings to purchase fixed assets that represents 10 percent or less of their sales.

Figure 3. Histogram of Internal Funds or Retained Earnings Used to Purchase Fixed Assets over Sales, LAC

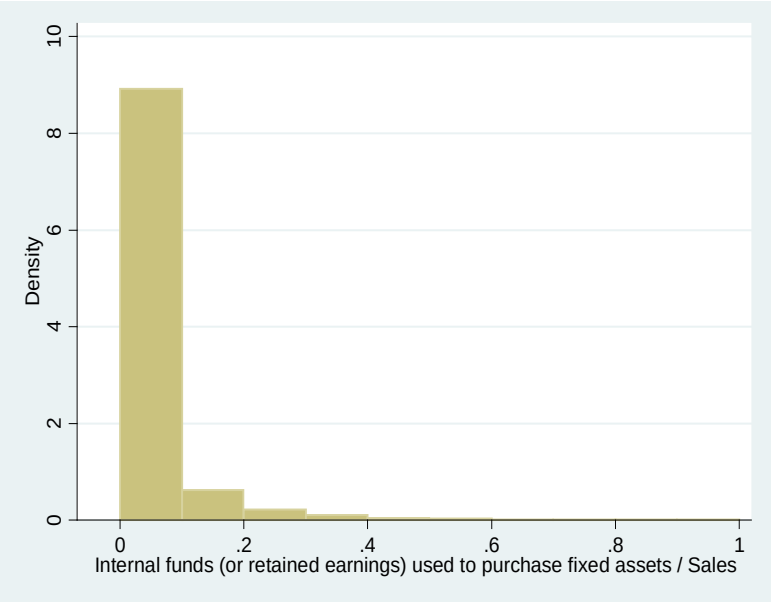


Table 1 below shows basic statistics for the three variables across countries. The average registered LAC firm reports financing about 58 percent of their purchases of fixed assets using internal funds.[15] A very similar value is observed for the proportion of firms financing working capital with internal funds. These values are clearly at odds to the traditional corporate finance Modigliani-Miller theorem, although they are consistent with the empirical literature. In Bahamas, Barbados, Dominica, Jamaica, Panama, St. Lucia, Uruguay and Venezuela, the average firm in the sample reports financing more than 70 percent of their purchases of fixed assets (or their working capital) with internal funds. On the other extreme, in Colombia and Peru, the average firm reports financing less than 50 percent with internal funds.

[15] The share of fixed assets financed with "owners' contribution or issued new equity shares" is 2.7 percent; "borrowed from banks," 23.7 percent; "borrowed from non-bank financial institution," 2.8 percent; "purchases on credit from suppliers and advances from customers," 9.2 percent; and "others," 3.3 percent. We focus on the use of retained earnings and internal funds, although an alternative definition could include "owners' contribution or issued new equity shares." However, as the figures show, the latter component is relatively small.

Table 1. Use of Internal Funds or Retained Earnings to Finance Purchases of Fixed Assets and Working Capital by Country

The first column of this table presents the average share of fixed assets financed with retained earnings for firms included in the WBES in each country. The second column presents the same average share applied to working capital financing with retained earnings. The last column presents the per-country average of the firm-level share of retained earnings used to purchase fixed assets normalized by the values of sales.

Country	Share of fixed assets financed with internal funds or retained earnings	Share of working capital financed with internal funds or retained earnings	Internal funds or retained earnings used to purchase fixed assets / sales
Antigua & Barbuda	0.6363	0.6987	-
Argentina	0.6535	0.6249	0.0402
Bahamas	0.7821	0.6497	-
Barbados	0.7637	0.6954	-
Belize	0.6872	0.6216	-
Bolivia	0.6573	0.6001	0.0673
Brazil	0.5322	0.4747	0.0418
Chile	0.5559	0.5437	0.0317
Colombia	0.4546	0.4259	0.0249
Dominica	0.7045	0.7708	-
Dominican Rep.	0.5561	0.4811	0.0342
Ecuador	0.5036	0.4901	0.0357
El Salvador	0.5266	0.5199	0.0476
Guatemala	0.6016	0.6227	-
Guyana	0.5530	0.4835	0.0575
Honduras	0.5635	0.5705	0.0341
Jamaica	0.7442	0.6376	0.0418
Mexico	0.6568	0.6926	0.0679
Nicaragua	0.6386	0.6173	0.0456
Panama	0.6332	0.7308	0.0565
Paraguay	0.6479	0.6515	0.0259
Peru	0.3991	0.4341	0.0386
St. Kitts and Nevis	0.4959	0.5407	-
St. Lucia	0.7285	0.7323	-
Vincent & Grenadines	0.5670	0.6437	-
Suriname	0.6562	0.5622	-
Trinidad & Tobago	0.5278	0.5037	0.0244
Uruguay	0.7241	0.6993	0.0394
Venezuela	0.6232	0.7404	0.0651
Average LAC	0.5758	0.5772	0.0396
Czech Republic	0.6222	-	0.0428
Germany	0.5153	0.5644	0.0299
Greece	0.7124	0.6883	0.0324
Hungary	0.6633	0.7158	0.0447
Ireland	0.4852	0.6266	0.0302
Israel	0.6531	0.7651	0.0268
Poland	0.6655	0.7224	0.0602
Portugal	0.6685	0.7878	0.0173
Spain	0.6002	0.6366	0.0266
Turkey	0.5875	0.7087	0.0590
OECD sample	0.5945	0.6747	0.0375

For comparison purposes we include a sample of firms from OECD countries for which WBES data are available (i.e., Czech Republic, Germany, Greece, Hungary, Ireland, Israel, Poland, Portugal, Spain and Turkey).[16] Firms in these countries use internal funds to finance fixed assets in a similar proportion as firms in LAC (59.5 percent compared to 57.6 percent). However, firms in these OECD countries report relying *more* on internal funds to finance working capital compared to firms in LAC (67.5 percent compared to 57.7 percent). Also, the estimates computed by Mayer (1990) for three developed countries between 1975 and 1990 (i.e., 66.9 percent in the United States, 55.2 percent in Germany and 72 percent in the United Kingdom) tend to be higher than those observed in LAC. The ratio between internal funds and sales, however, is slightly higher in the LAC sample. The purchases of fixed assets with internal funds or retaining earnings represent 4 percent of sales in the average LAC firm, compared to 3.7 percent in the average OECD firm.

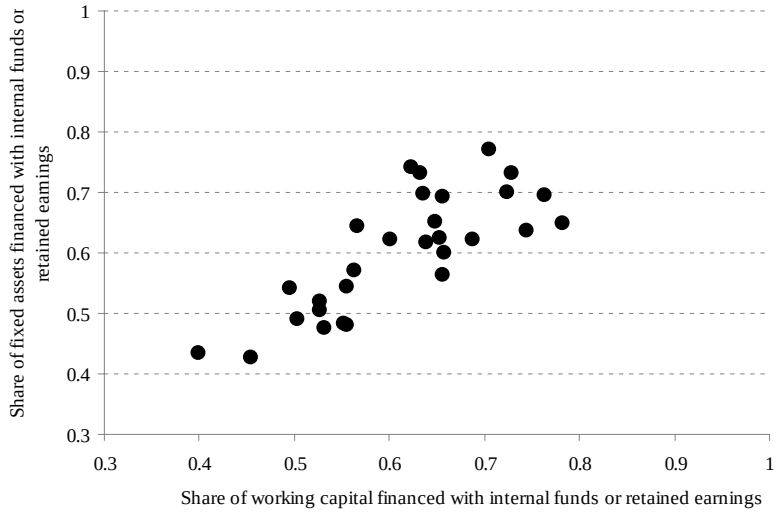
At first glance, this result may look surprising.[17] Indeed, LAC firms are perceived as more concentrated.[18] Also, legal systems in LAC countries show worse investor-protection indicators.[19] However, some recent empirical literature has shown that several capital structure features such as corporate leverage may not be different when comparing OECD firms with LAC firms. In particular, Céspedes, González and Molina (2010) find that the leverage of LAC public firms does not differ from that of public U.S. firms.[20] The facts presented in this paper on reliance on internal funds for investment and working capital are consistent with the latter. Those facts contrast with results in Maquieira, Preve and Sarria-Allende (2012), who find that small and medium businesses in LAC present lower debt levels than their U.S. counterparts. This comparison suggests that at least size (and other features correlated with it, such as whether the firm is publicly listed or not) may be related to the level of reliance of retained earnings for both asset purchase uses. This is explored below.

[16] Regrettably, there are no data for either the United States or Canada.
[17] This result does not appear to be driven by differences in the representativeness of the sample between LAC and OECD (i.e., exclusion of small registered firms in LAC). As we show below, the same results hold when the comparison is conditional on firm size. Of course, if informal firms were included, we suspect that results would be substantially different because informal firms are quite more prevalent in LAC and because informal firms tend to rely more on internal funds.
[18] See, e.g., Chong and López-de-Silanes (2007).
[19] See La Porta et al. (1997 and 1998).
[20] In fact, for some leverage definitions introduced in Céspedes, González and Molina (2010) the average value of that leverage across LAC firms is even higher than their U.S. counterparts.

Also, the levels of reliance of investment and working capital on retained earnings shown above may not imply a significantly large share of retained earnings (the most commonly used indicator of savings in registered firms) financing investment in fixed assets. As a share of sales, the evidence shows that about 90 percent of firms in LAC countries included in the sample allocate a level of retained earnings to purchase fixed assets that represents 10 percent or less of their sales. This fact cannot be qualified as encouraging. Indeed, if most of the purchase of capital assets is financed by retained earnings, and if the amount of retained earnings destined for those purchases represent such a low level of sales, it is simply because the purchase of capital assets by these firms would tend to be low.

Before analyzing the correlation of the variables of interest with different firm characteristics, we would like to confirm the level of correlation between the use of internal funds to finance purchases of fixed assets and the use of internal funds to finance working capital. For example, Figure 4 shows that both are positively correlated when comparing the average firm across countries. However, the correlation across firms is far from perfect. The pairwise correlation is equal to 0.49 suggesting that it is worth analyzing both variables.

Figure 4. Use of Internal Funds or Retained Earnings to Finance Purchases of Fixed Assets and Working Capital by Country, LAC



3.1.1 Reliance on Internal Funds and Firm Size

Figures 5, 6 and 7 below present the variation in the use of internal funds by firm size. Firm size is defined as the total number of employees (both permanent and temporary) working in the establishment at the end of the last fiscal year. We group firms into five size categories: firms with 5 or fewer employees, 6 to 10, 11 to 50, 51 to 100, and 101 or more.[21]

Figure 5. Share of Fixed Assets Financed with Internal Funds or Retained Earnings by Firm Size

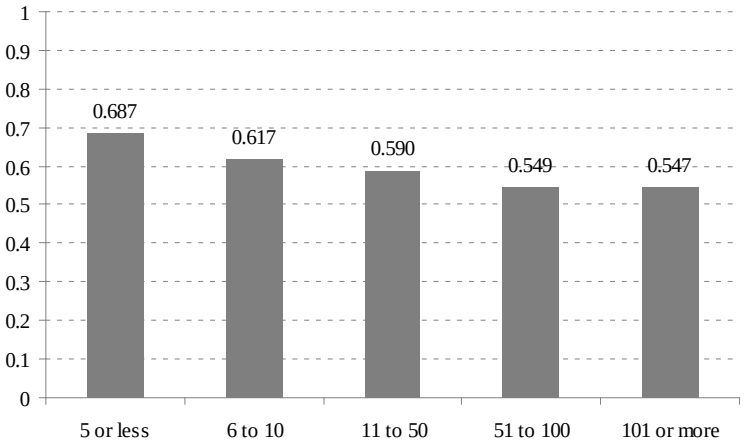
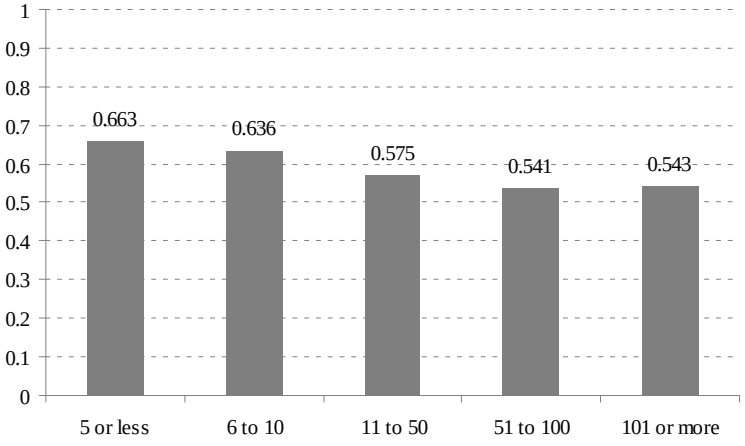
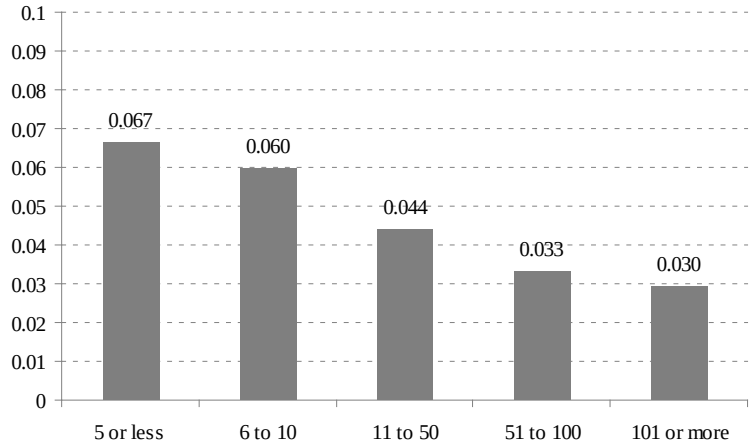


Figure 6. Share of Working Capital Financed with Internal Funds or Retained Earnings by Firm Size



[21] These categories are unbalanced: only 1,227 firms in the sample have 5 or fewer employees, 4,095 have between 6 and 10, 11,725 have 11 to 50, 3,371 have 51 to 100, and 5,935 have 101 or more. There are relatively few micro firms because the sample only covers registered firms and was also intended to cover larger firms. We keep the micro firm category to be able to compare later on registered and nonregistered firms with similar number of employees.

Figure 7. Purchases of Fixed Assets Financed with Internal Funds or Retained Earnings over Sales by Firm Size



The three figures above show a negative relationship in each case. Small firms, compared to large firms, rely more heavily on internal funds to finance both purchases of fixed assets and their working capital. This result is consistent with the general intuition that it is more costly for smaller firms to access credit from financial institutions. However, the difference in the use of internal funds between small and large firms is quantitatively small. While very small firms finance 68.7 percent of their purchases of fixed assets with internal funds, the figure is 54.7 percent (more than 20 less) among firms with 101 or more employees. A negative correlation between firm size and use of internal funds is also observed in the OECD sample.

Notice that the percentage of investment financed with retained earnings among registered firms in LAC is slightly below firms in OECD countries regardless of firm size. For the smallest size category (i.e., less than 5 employees) the ratio is 68.7 percent in LAC compared to 70.8 percent in OECD; for the largest firms (more than 100 workers) the ratios are 54.7 percent and 60.7 percent; and for firms in between (6 to 100 employees) the ratios are 58.5 percent in LAC and 63.9 percent in OECD. These features are consistent with the evidence presented in Ayyagari, Dermirgüç-Kunt and Maksimovic (2010), Céspedes, González and Molina (2010) and Maquieira, Preve and Sarria-Allende (2012). The first of those papers, using WBES data from 2003, finds that the share of retained earnings on investment for the average LAC firm is equal to 53.96 percent. That same paper reports that the comparable figure for the average high-income-OECD-country firm is 58.22 percent. In its turn, Céspedes, González and Molina (2010) compare the leverage of publicly listed LAC firms with their U.S. counterparts,

showing a similar value for that variable between those two groups of firms. On the other hand, Maquieira, Preve and Sarria-Allende (2012) compare leverage of small and medium companies between the two regions, showing a lower leverage for LAC firms. The negative correlation between size and reliance on internal funds found here works then in the same direction as the evidence of those two papers.

Regarding the conceptual rationale for that negative correlation, using part of the related theoretical literature, notice that some of those papers are not necessarily consistent with that negative correlation. For example, the model in Gomes (2001) predicts that small and/or very productive firms tend to be the ones financing investment with external sources. Instead, some other papers' theoretical predictions are still consistent with the size correlation found here. In particular, papers linking the reliance of investment to endogenous borrowing constraints due to asymmetric information or agency costs are consistent with larger firms being less dependent on internal funds. In the case of Clementi and Hopenhayn (2006), larger firms face softer borrowing constraints since they managed to better signal their past behavior to potential creditors. In De Marzo et al. (2012), larger firms are able to overcome more efficiently the principal-agent problem present in their environment.

3.1.2 Reliance on Internal Funds and Firm Age

Another obvious firm characteristic that may be correlated to the reliance on internal funds for investment and working capital may be age. However, Figures 8 to 10 below show no clear pattern of those variables across firm ages. If anything, the correlation may appear to be positive in certain cases.

Figure 8. Share of Fixed Assets Financed with Internal Funds or Retained Earnings by Firm Age

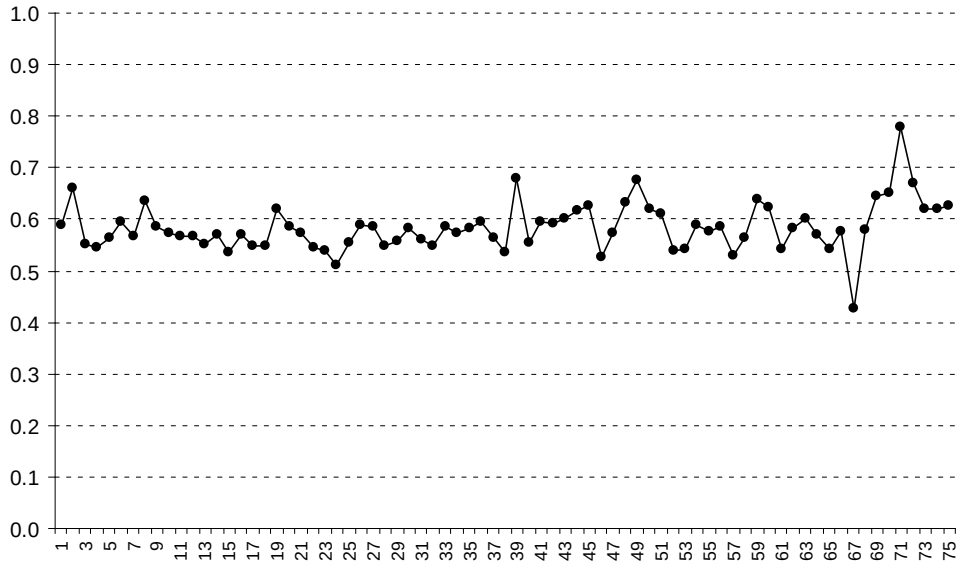


Figure 9. Share of Working Capital Financed with Internal Funds or Retained Earnings by Firm Age

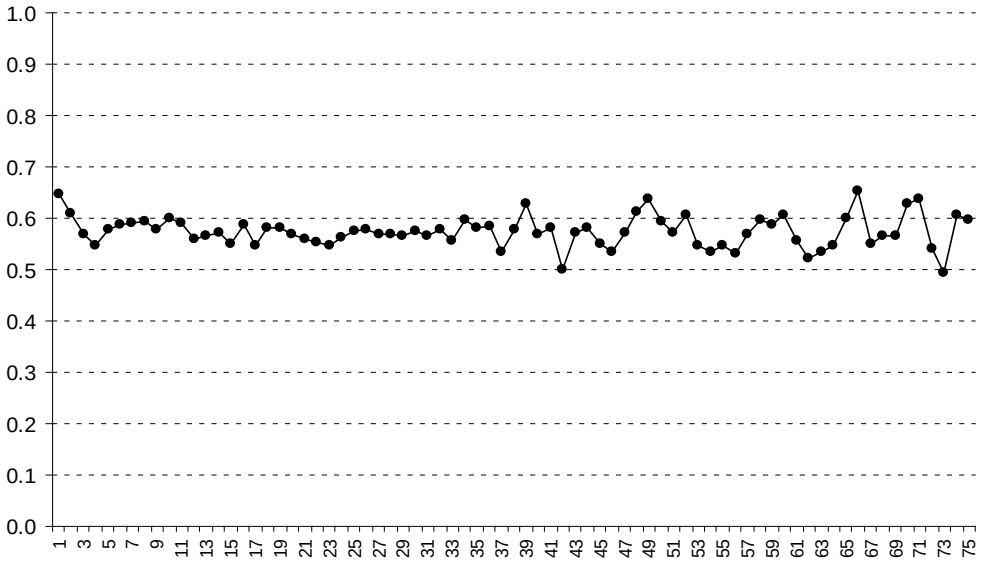
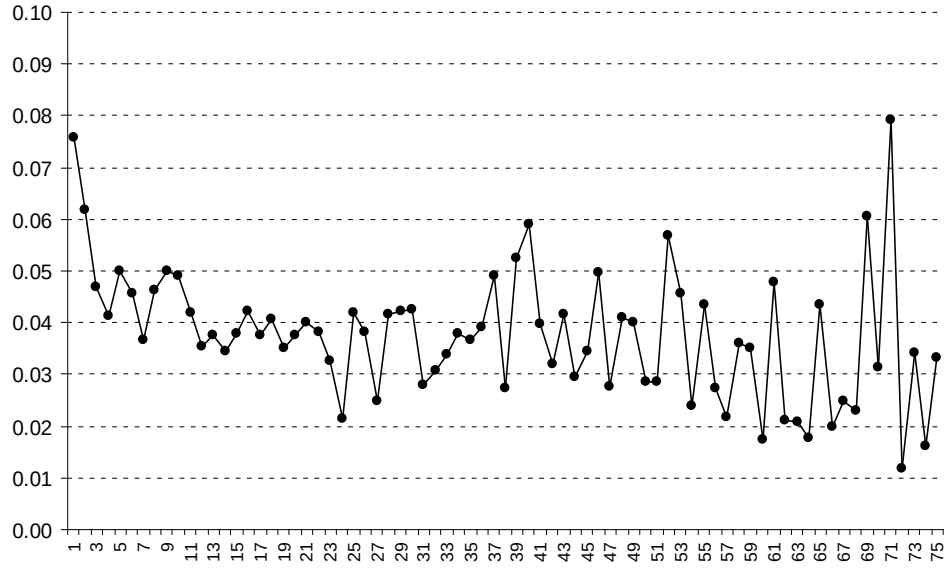


Figure 10. Purchases of Fixed Assets Financed with Internal Funds or Retained Earnings over Sales by Firm Age



At first glance, this virtual independence of (or, even worse, the positive correlation between) age and the reliance on internal funds for investment may be viewed as puzzling. The abovementioned model by Clementi and Hopenhayn (2006) predicts a positive correlation between age and size, since there the older firms that manage to survive longer are also larger. The latter is clearly not consistent with the facts found in this study.[22] On the other hand, the prediction from Riddick and Whited (2009) on how investment is funded by current cash holdings may be seen as consistent with the possible positive correlation between age and reliance on internal funds. Indeed, that paper predicts that older firms may have been able to either accumulate more cash or to generate it from reputation effects. Thus, such firms may be those more prone to use their own cash position to purchase new capital, since borrowing may entail additional costs that these older firms can avoid in the way discussed above.

This finding on the absence of correlation of age with the three retained-earnings-related variables of interest obtained here can also be compared with results in some of the empirical papers mentioned above. In particular, Chavis, Klapper and Love (2011) find no clear correlation

[22] Incidentally, Gomes' (2001) prediction that, on the one hand, only very unproductive firms disappear from the market and, on the other, very small (and productive) firms tend to finance part of their investment with external funds may also be interpreted as possibly consistent with the weak positive correlation between age and reliance on internal funds, since larger firms may have been those more productive in the past but which now tend to substitute external finance with internal finance.

between the share of either investment or working capital financed by retained earnings and firm age in their sample. On the other hand, Zhao, Tan and Yao (2012) find a positive correlation between the share of retained earnings over investment and firm age in some specifications, and no correlation in others, consistent with the findings here. Figueroa and Wagner (2014), in turn, find that the ratio between retained earnings and their estimate of profits is strongly negatively correlated with age, unlike the behavior of our ratio between retained-earnings-for-investment and sales.

3.1.3 Other Firm Characteristics

Table 2 below presents statistics of share of investment and working capital financed by retained earnings divided by sector of activity, size of the city where the firm is located (defined according to the population), and ownership structure. The use of internal funds, either for financing fixed assets or working capital, is higher among firms in the service sector, located in smaller cities, and with a single owner.[23]

Table 2. Use of Internal Funds or Retained Earnings to Finance Purchases of Fixed Assets and Working Capital by Sector, Size of the Locality and Ownership Structure

This table presents the share of both fixed assets (column 2) and working capital (column 3) financed with retained earnings by sector, size of the city where the firm is located and ownership structure. The last column also presents the ratio between retained earnings used to buy fixed assets and sales, also divided by the abovementioned categories.

Variable	Share of fixed assets financed with internal funds or retained earnings	Share of working capital financed with internal funds or retained earnings	Internal funds or retained earnings used to purchase fixed assets / sales
Manufacturing	0.5599	0.5629	0.0410
Services	0.6115	0.6059	0.0365
Capital City	0.5330	0.5352	0.0335
City ≥ 1 million	0.5758	0.5524	0.0359
City 250,000 to 1 million	0.5490	0.5425	0.0406
City 50,000 to 250,000	0.5662	0.5264	0.0421
City less than 50,000	0.6203	0.5964	0.0369
Single ownership	0.6065	0.6156	0.0467
More than 1 owner	0.5584	0.5453	0.0342
Average LAC	0.5758	0.5772	0.0396

[23] Data on the locality of the firm and the ownership structure are missing for a large number of firms. For example, we only observe locality for 14,705 out of the 26,413 firms in the LAC sample; we observe single ownership for 22,470, and do not observe any information on separation of ownership and control. In Appendix 3 we discuss measurement issues related to ownership structure.

As a summary of the partial correlation analysis performed above, we compute conditional correlations by running the following econometric model:

(1) $Y_{ij} = \beta X_{ij} + \theta_j + \varepsilon_{ij}$,

where Y_{ij} measures the use of internal funds (either to finance working capital or fixed assets) in firm i in region j, X is the vector of covariates and θ is an indicator equal to 1 if the firm is located in LAC and 0 otherwise. We use the sample of all LAC and the OECD countries described above and include two covariates at the country level: GDP per capita and the level of financial development (defined as domestic credit to the private sector as a share of GDP).

Table 3. Firm Characteristics and the Use of Internal Funds

This table presents the results of the regression equation:

$$Y_{ij} = \beta X_{ij} + \theta_j + \varepsilon_{ij},$$

In column 1, the dependent variable corresponds to the share of fixed asset purchases financed by retained earnings. Column 2 defines the dependent variable as the share of working capital financed by retained earnings. Column 3 uses the ratio between retained earnings used to purchase fixed assets and sales as the dependent variable. In each case, the control variables include dummies of LAC region inclusion, being a manufacturing firm, and whether the firm has a single owner, as well as firm age, qualitative categories of size by range of number of workers and macro controls such as GDP per capita (at the country level) and the percentage of credit over GDP. For each regression the table reports the point estimation as well as the standard errors clustered by country.

Variable	Share of fixed assets financed with internal funds or retained earnings		Share of working capital financed with internal funds or retained earnings		Internal funds or retained earnings used to purchase fixed assets / sales	
	Coefficient	Std. error	Coefficient	Std. error	Coefficient	Std. error
LAC region	-0.0074	(0.0174)	-0.0925**	(0.0296)	-0.0183**	(0.0036)
Manufacturing	-0.0372**	(0.0095)	-0.0281	(0.0151)	0.0066**	(0.0022)
Single owner	0.0464**	(0.0148)	0.0625**	(0.0136)	0.0097**	(0.0021)
Firm age	0.0008**	(0.0003)	0.0004	(0.0003)	-0.0001	(0.0001)
6 to 10 workers	-0.0301	(0.0291)	-0.0010	(0.0119)	-0.0049	(0.0077)
11 to 50 workers	-0.0532	(0.0288)	-0.0456**	(0.0152)	-0.0200*	(0.0085)
51 to 100 workers	-0.0926**	(0.0325)	-0.0746**	(0.0196)	-0.0285**	(0.0087)
101+ workers	-0.1047**	(0.0351)	-0.0778**	(0.0234)	-0.0318**	(0.0089)
GDP per capita	0.0054*	(0.0024)	0.0062*	(0.0026)	-0.0009**	(0.0004)
Credit (% GDP)	-0.0005	(0.0005)	-0.0007	(0.0006)	-0.0001	(0.0001)
No. observations	15,530		24,322		10,919	

Note: Statistically significant at the * 0.05, ** 0.01 level.

The results reported in Table 3 support most of the simple partial correlations presented above. Firms that produce manufacturing goods, firms that have more employees, that have more than a single owner, and that are located in LAC (compared to a sample of firms in OECD

countries) tend to rely less on the use of internal funds to finance either fixed assets or working capital. The same correlations hold for the imperfect measure of internal funds over sales except for the manufacturing sector. Table 3 also shows that firms located in countries with a more developed financial sector appear to rely less on the use of internal funds, although the relationship is usually not statistically significant. We discuss this issue in the next subsection.

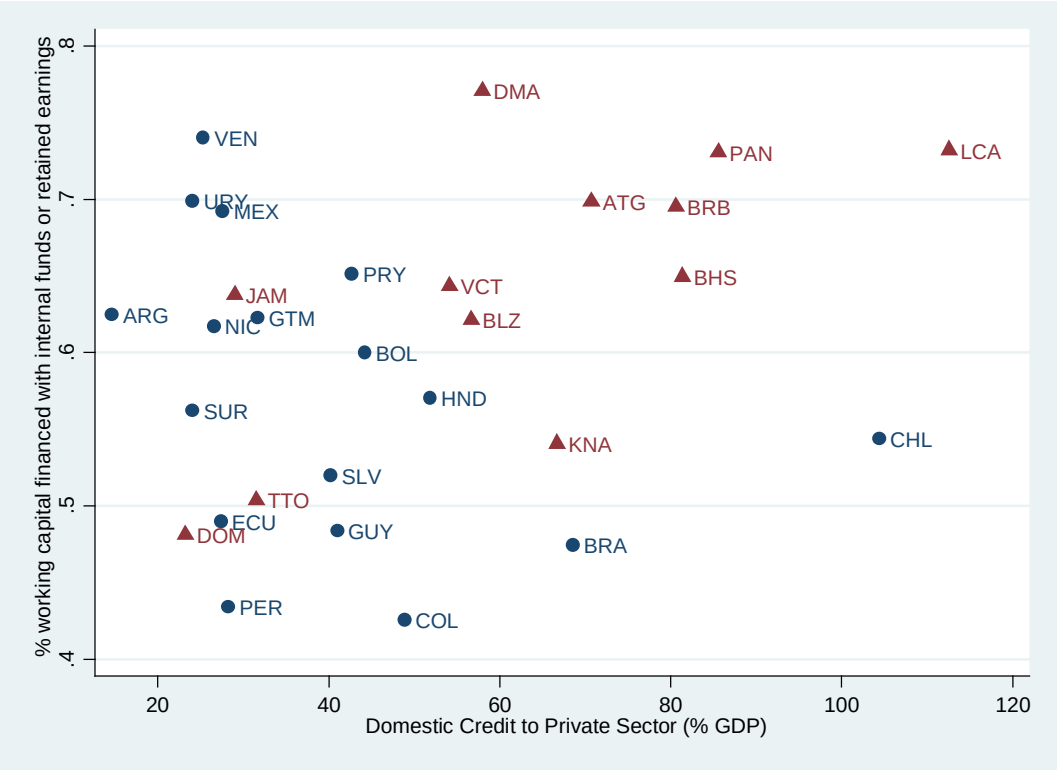
3.2 Use of Internal Funds and Financial Development

In countries where the financial sector is more developed, we expect firms to be less likely to finance their working capital and the purchases of fixed assets with internal funds or retained earnings. The basic reason is that more developed financial systems would presumably reduce the cost of external finance for firms, reducing the incentives to use internal funding.

This subsection explores whether the last conjecture holds with the WBES database used here. To do this, we present scattered plot figures of country average share of both fixed-asset purchases and working capital financed with retained earnings correlated with an indicator of financial development at the country level. We use two measures of financial sector development from the World Bank World Development Indicators: Domestic credit to the private sector (as a share of GDP) and Market capitalization of listed companies (as a share of GDP).

Using the first measure shows, contrary to the expectation, a positive correlation (Figure 11). Firms in LAC countries with higher domestic credit to the private sector as a share of GDP tend to rely more heavily on the use of internal funds to finance working capital. We also find a positive correlation when we restrict the sample to micro, small, medium, and large firms, and when we analyze the use of internal funds to finance purchases of fixed assets, although in the majority of these cases the correlation is insignificant.

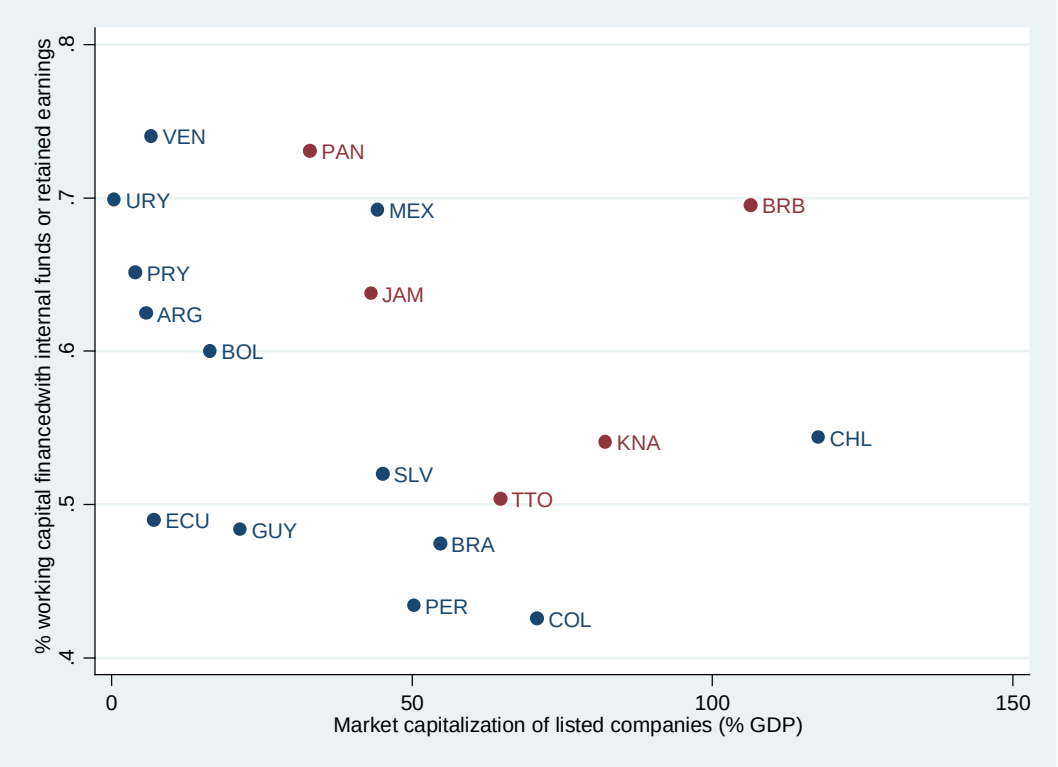
Figure 11. Domestic Credit to Private Sector (% GDP) and Use of Internal Funds to Finance Working Capital across Countries, LAC



These results appear to be partially influenced by tax havens. When Panama and the Caribbean countries are excluded from the sample, all the cross-country correlations between domestic credit and use of internal funds become negative as expected.

When the other measure of financial development (i.e., market capitalization as a share of GDP) is used (Figure 12), we observe the expected negative correlation even including the sample of Caribbean countries in the analysis.

Figure 12. Market Capitalization (% GDP) and Use of Internal Funds to Finance Working Capital across Countries, LAC



3.3 Use of Internal Funds among Non-Registered Firms

As stated above, the WBES for informal firms includes two questions asking whether that source was used or not. Implying the impossibility of computing a measure of retained earnings over sales, this section describes instead the share of non-registered firms using internal funds as one of the financing sources to purchase fixed assets, and the share of those using internal funds as one financing source for working capital.[24] Panel A of Table 4 below presents the results for fixed assets, and Panel B for working capital

[24] Another difference between the questionnaire used for formal and informal firms is that the latter, instead of asking about "working capital," asks about "day-to-day operations." This different wording is unlikely to be a major impediment to comparing across samples.

Table 4. Share of Firms That Use Internal Funds to Finance Purchases of Fixed Assets and Working Capital, by Country, and for Small Registered and Non-Registered Firms

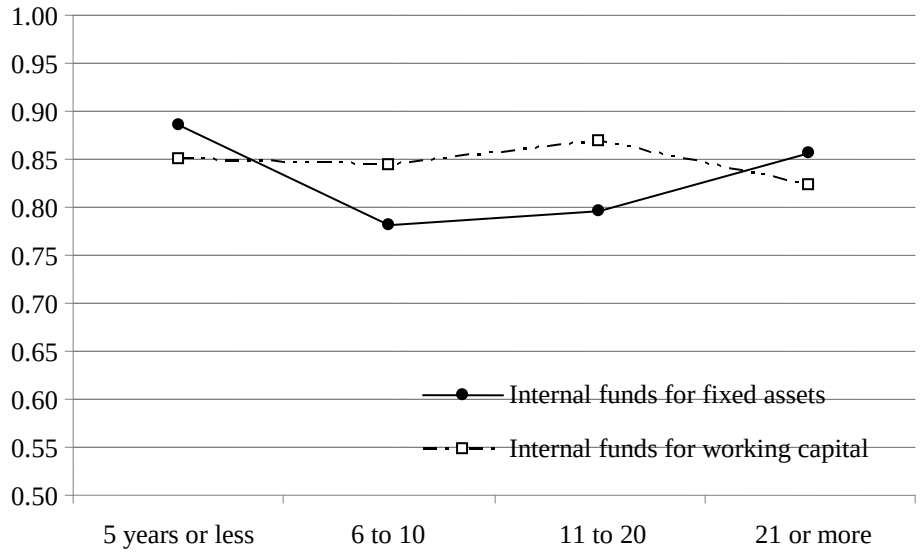
	Argentina	Guatemala	Peru
Panel A: Purchases of Fixed Assets			
Share of nonregistered firms that financed fixed assets with internal funds or retained earnings	0.8721	0.8750	0.8036
Share of nonregistered firms with 5 or less employees that financed fixed assets with internal funds or retained earnings	0.8675	0.8710	0.8018
Share of registered firms with 5 or less employees that financed fixed assets with internal funds or retained earnings	0.9762	0.7143	0.5000
Panel B: Working Capital			
Share of nonregistered firms that financed working capital with internal funds or retained earnings	0.8063	0.8733	0.8625
Share of nonregistered firms with 5 or less employees that financed working capital with internal funds or retained earnings	0.8081	0.8807	0.8619
Share of registered firms with 5 or less employees that financed working capital with internal funds or retained earnings	0.9208	0.7424	0.7742

The first row in panel A indicates that approximately 85 percent of non-registered firms in Argentina, Guatemala and Peru (the only countries in LAC where the informal survey was conducted) use internal funds or retained earnings to finance purchases of fixed assets. When the sample is restricted to nonregistered firms with 5 or less employees (which actually constitute the large majority of informal firms in the sample), the figures reduce slightly. The third row presents the share of *registered* firms with 5 or less employees that report using internal funds to finance fixed assets.

In Guatemala and Peru, it appears that registered firms rely less on internal funds compared to informal firms, but in Argentina the opposite occurs. Very similar facts are observed when we analyze the use of internal funds to finance working capital. Furthermore, the differences are not large. Overall, these results suggest that, for an average micro firm, registering its business with the tax authorities has a small effect on reducing the cost of external credit.

Figure 13 below shows that, as in the case of registered firms, the use of internal funds to finance fixed assets and working capital varies very little by firm age.

Figure 13. Use of Internal Funds to Finance Fixed Assets and Working Capital by Firm Age, Non-Registered Firms



3.4 Use of Internal Funds and Firm's Access to Credit

One of the most popular explanations for a heavy reliance on retained earnings to finance investment or working capital is the tightness of credit constraints. This section reports the correlation between each of the three variables of interest (that is, the shares of fixed assets and working capital financed with internal funds or retained earnings and the ratio of internal funds or retained earnings used to purchase fixed assets over sales) and one of two alternative measures of firms' access to credit included in the survey. The first measure is whether the firm has a credit line available. The second measure is more subjective, and it is the answer to a question of whether the respondent of the firm considers access to finance a major obstacle for the operation and growth of the business.[25] The analysis presents first results for registered companies and then for the nonregistered ones.

Figures 14, 15 and 16 below graph the scatter plots of each variable of interest against the proportion of registered firms in LAC countries that held a line of credit at the time of the interview.

[25] In some cases it was a yes/no question and in others it included different degrees of consideration (no obstacle, minor obstacle, etc.). To standardize across questionnaires, we computed a dummy variable that equals 1 when the respondent indicated that access to finance was at least a major obstacle for the operation and growth of their business.

Figure 14. Percentage of Fixed Assets Financed with Internal Funds or Retained Earnings and Percentage of Firms with an Open Line of Credit, Averages by LAC Countries, Registered Firms

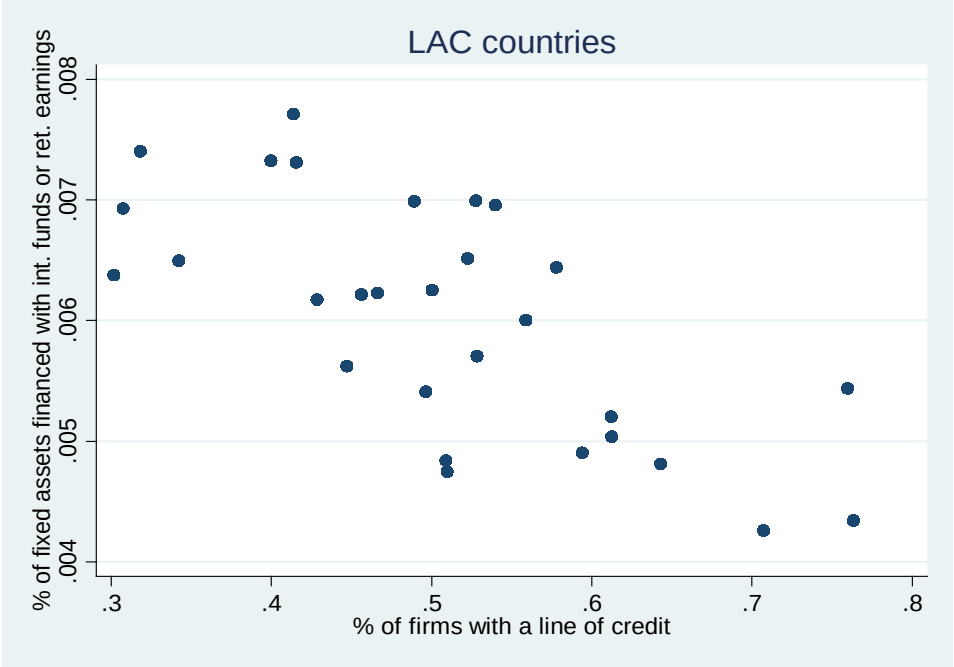


Figure 15. Percentage of Working Capital Financed with Internal Funds or Retained Earnings and Percentage of Firms with an Open Line of Credit, Averages by LAC Countries, Registered Firms

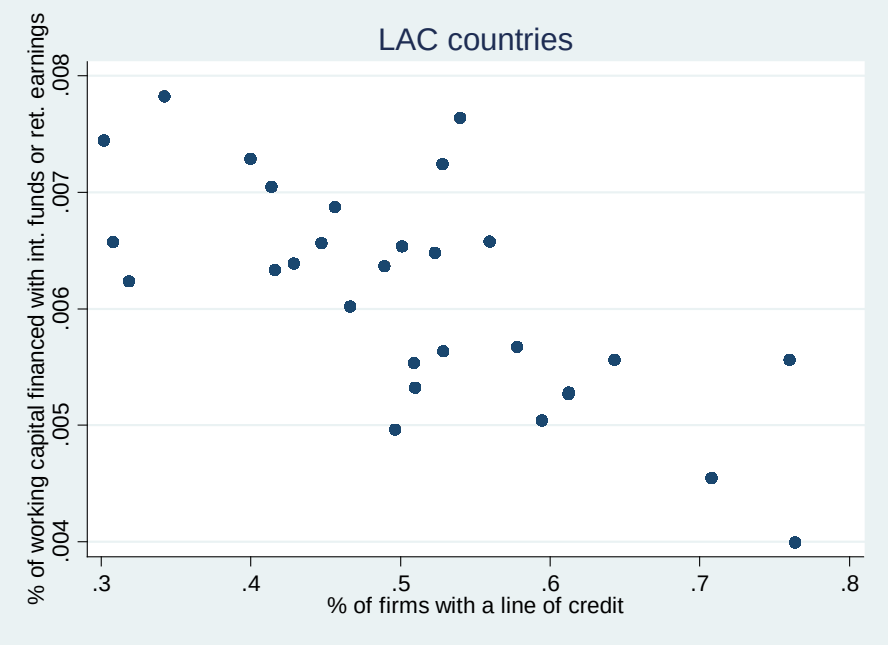
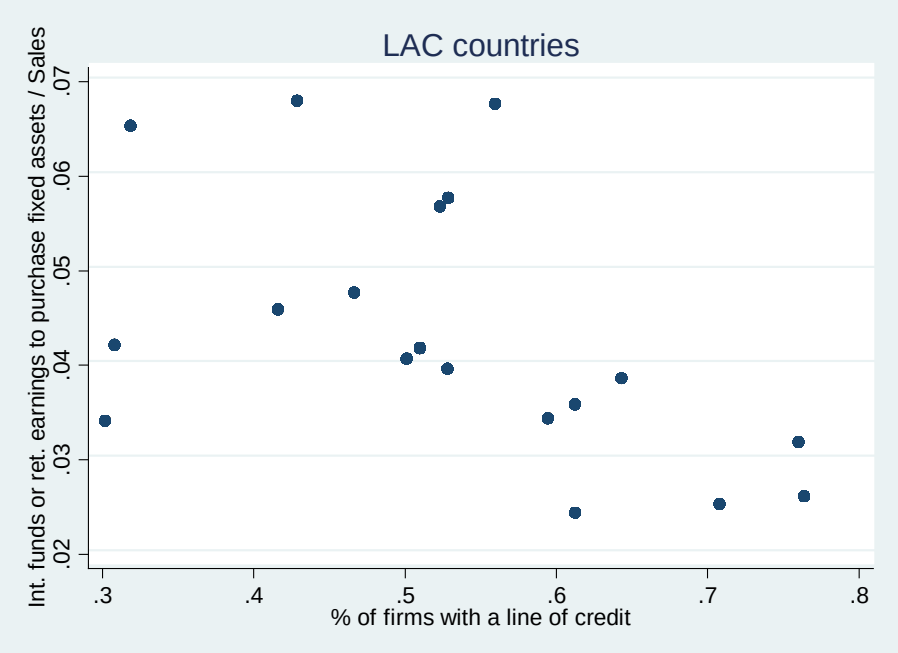


Figure 16. Ratio of Internal Funds or Retained Earnings Used to Purchase Fixed Assets over Sales and Percentage of Firms with an Open Line of Credit, Averages by LAC Countries, Registered Firms



In the three cases the plot shows that, in countries where firms have a higher level of access to credit on average, the use of internal funds or retained earnings to finance the business tends to be smaller. The respective correlation coefficients are—as in the order of the charts presented—equal to -0.7505 in the first case, -0.7163 in the second case and -0.5654 in the third.[26]

The last results shown may be theoretically rationalized by, e.g., Bolton, Chen and Wang (2011, Section 7). That paper presents a version of a dynamic model that assumes the availability of a limited credit line for firms (up to a constraint given by the collateral value) which face higher costs of external finance above that limit. Such credit reduces the sensitivity of investment to cash relative to the benchmark-case model without that credit line. This reduction works in the same direction as the negative correlation between the availability of more generous credit lines and each of the three variables in this section. The reason for that decline in the investment-cash sensitivity coefficient in that model is that, when the firm is close to running out of cash, the credit line still provides enough liquidity to avoid a sharp decrease in investment expenditures and/or massive asset sales, which happens in the absence of the credit line. Thus, that paper

[26] A similar negative correlation is observed using the sample of OECD countries. The correlation coefficients are, respectively, -0.9070, -0.9443, and -0.3242.

provides a reasonable possible mechanism that may explain the negative correlations found here. However, stating with more certainty that this mechanism is actually at work in our data is far from the goal of this paper, given the previously mentioned limitations of the database.

Figures 17 to 19 graph the correlation of each of the three variables of interest in LAC countries with the *subjective* access-to-credit variable included in the survey when considering only registered firms.

Figure 17. Percentage of Fixed Assets Financed with Internal Funds or Retained Earnings and Percentage of Respondents Considering Access to Finance at Least a Major Obstacle, Averages by LAC Countries, Registered Firms

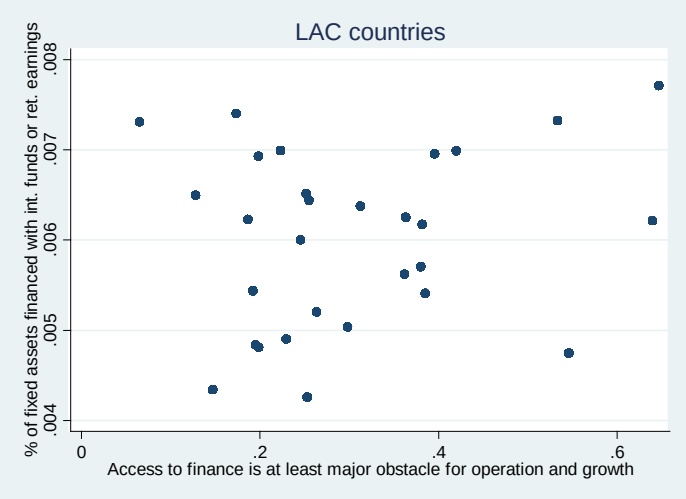


Figure 18. Percentage of Working Capital Financed with Internal Funds or Retained Earnings and Percentage of Respondents Considering Access to Finance at Least a Major Obstacle, Averages by LAC Countries, Registered Firms

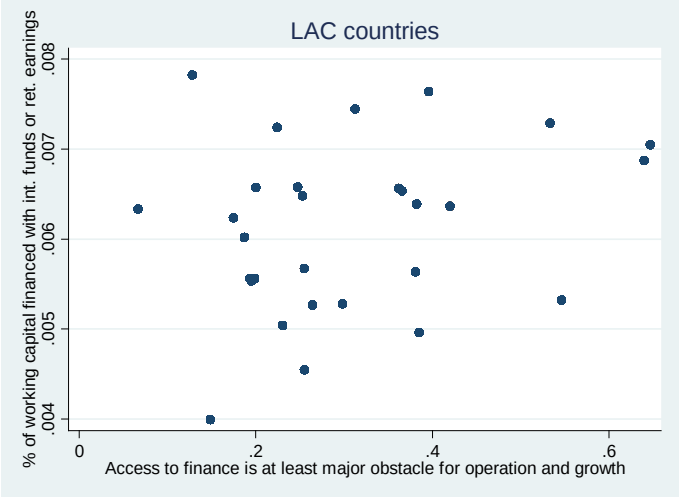
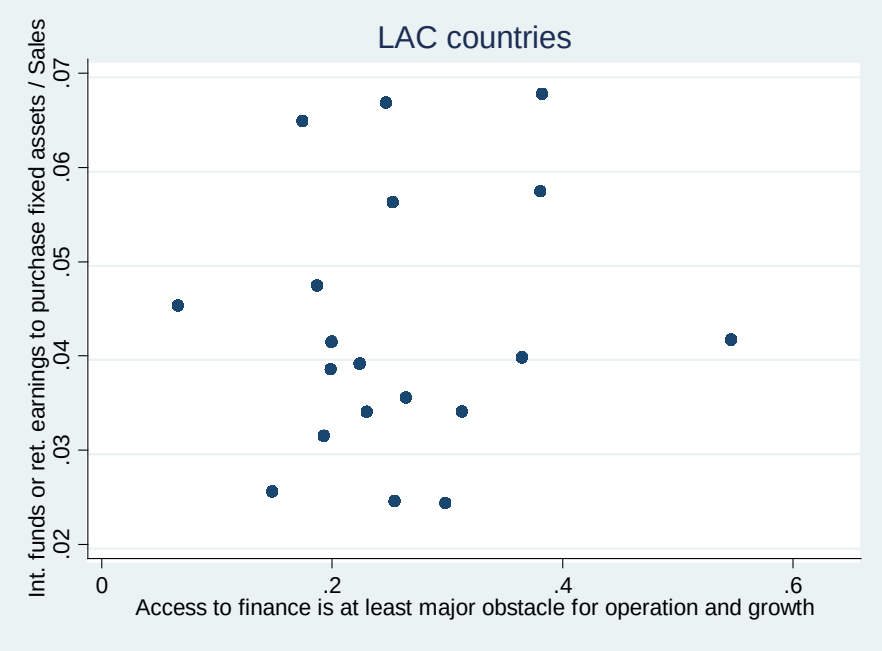


Figure 19. Ratio of Internal Funds or Retained Earnings Used to Purchase Fixed Assets over Sales and Percentage of Respondents Considering Access to Finance at Least a Major Obstacle, Averages by LAC Countries, Registered Firms



The three figures above show that the correlation is considerably weak for LAC firms in the three variables of interest. Correlation coefficients are equal to -0.3669, -0.0696 and 0.1433, respectively. Note that in the first two cases the sign is the opposite of what the conventional wisdom would predict, although in a rather weak fashion.[27]

Finally, as explained above, for informal firms we computed dummy versions of the first two variables of interest (the shares of fixed assets and working capital financed with internal funds or retained earnings) indicating whether these sources of financing were used by the company or not. The correlations are presented in the following table.

[27] Among OECD countries the variables tend to correlate more strongly than among LAC countries and have a positive sign. The correlation coefficients are 0.7406, 0.7942 and 0.3444.

Table 5. Correlation between Use of Internal Funds and Access to Finance across Non-Registered Firms in LAC

This table presents a simple correlation coefficient between, alternatively, the proportion of non-registered firms using retained earnings to purchase fixed assets (first line) or finance working capital (second line) and, also alternatively, the share of firms with access to a credit line (first column) or to the share of firms reporting the lack of access to external finance being at least a major obstacle (second column).

Variable of interest	% Non-registered firms with a line of credit	Access to finance is at least major obstacle
Proportion of firms using int. funds or ret. earnings to finance fixed assets	-0.3588	0.0433
Proportion of firms using int. funds or ret. earnings to finance working capital	-0.2993	0.0712

Among informal firms, correlations are weak between the use of internal funds or retained earnings and the level of access to finance, but in all cases they have the expected sign. Non-registered firms that do have access to credit are less likely to use internal funds or retained earnings to finance working capital or purchases of fixed assets.

The results presented in this last sub-section assumes that the behavior of the share of investment and working capital financed by retained earnings (as well as the ratio between retained earnings used to finance investment to sales) may reflect different degrees of access to credit. However, a more recent literature[28] suggests that such reliance of investment on internal funds may reflect problems of access to formal savings accounts. In other words, the underlying problem may be the presence of (formal) savings constraint access, not necessarily credit constraints, especially for informal firms. We then compute the relationship between the proportion of firms with checking/savings account and the use of internal funds across LAC countries. That correlation is basically zero.[29] Although that correlation is clearly not conclusive, it suggests that the behavior of the reliance on internal funds does not seem strongly linked to the presence of formal savings constraints.

[28] See, e.g., Dupas and Robinson (2013) for a randomized experiment in Kenya, and Kast and Pomeranz (2014) for another randomized experiment in Chile.
[29] Detailed results are available upon request.

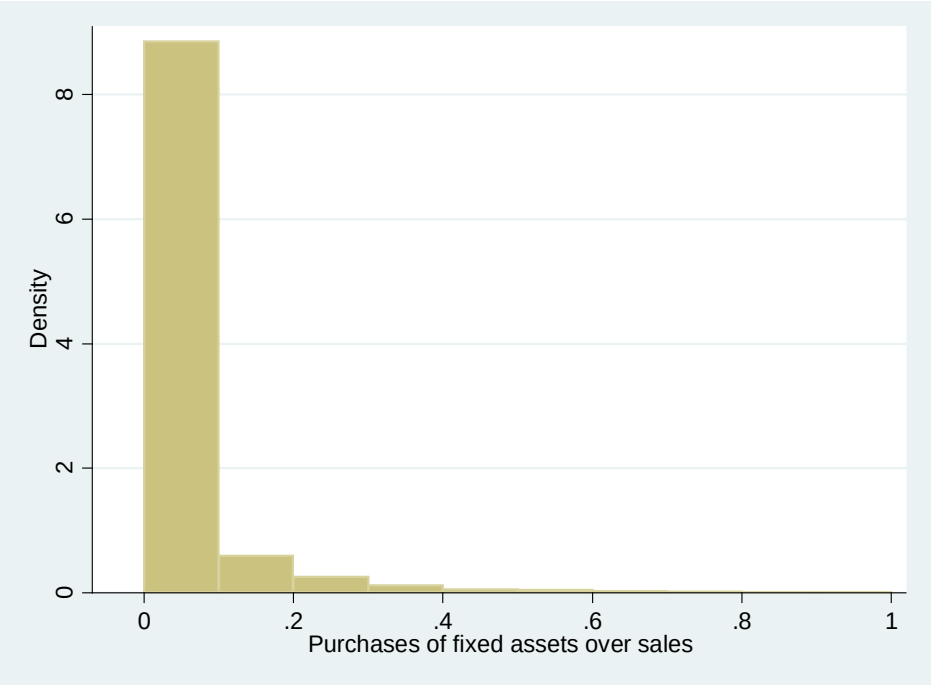
4. Investment in Fixed Assets

This section presents descriptive statistics on firms' investment in fixed assets. Computing facts on investment in fixed assets allows understanding more in depth some of the facts regarding the financing of purchases of fixed assets. In particular, the (somewhat weak) positive correlation between the share of fixed assets purchases with retained earnings and firm age, as well as the larger share of those purchases for OECD countries relative to LAC countries, may both be related to the behavior of investment vis-à-vis the behavior of retained earnings. By looking at investment in fixed assets one can possibly understand, for example, whether the reason why older firms seem to "depend more on own funding sources" may just be related to both higher investment and higher retained earnings, but where the latter is greater than the former.

As stated in Section 2, the WBES questionnaire for formal firms asks about the amount spent on purchases of different fixed-asset items during the last complete fiscal year. As noted above, the questionnaire also asks about total sales during the last year, and based on these questions we compute the variable purchases of fixed assets over sales. Recall also that the WBES for informal firms also asks about purchases of fixed assets and sales, but using a different period between them.

In part because these questions were not asked in some Caribbean countries, and also because some firms did not respond, the variable is observed for 20,114 out of 27,572 registered firms, and for 1,078 out of 1,167 nonregistered firms. Almost 50 percent of firms did not invest in any fixed asset during the previous year, and 35 percent invested less than 10 percent of their sales, as shown in Figure 20.

Figure 20. Histogram of Purchases of Fixed Assets over Sales, Registered and Nonregistered Firms



On the other hand, Table 6 below shows the average value of the investment-to-sales ratio by country distinguishing between registered and nonregistered firms. For the whole LAC region, the average of purchases of fixed assets represents 7.4 percent of sales for registered firms. However, there is a large dispersion of this ratio across LAC countries. While Brazil and Honduras have rates above 12 percent, Jamaica, Mexico, Uruguay and Venezuela have rates below 5 percent.[30] On the other hand, the average for LAC is below the average for the sample of OECD countries (7.4 percent compared to 8.0 percent).[31]

[30] We excluded from the sample three observations that report purchases of fixed assets representing 100 times or more the amount of sales.

[31] This comparison is not arbitrary. McLean, Zhang and Zhao (2011) find that firms in countries with better investor protection (presumably, OECD countries relative to LAC) depend less on internal finance and invest ex-post more efficiently.

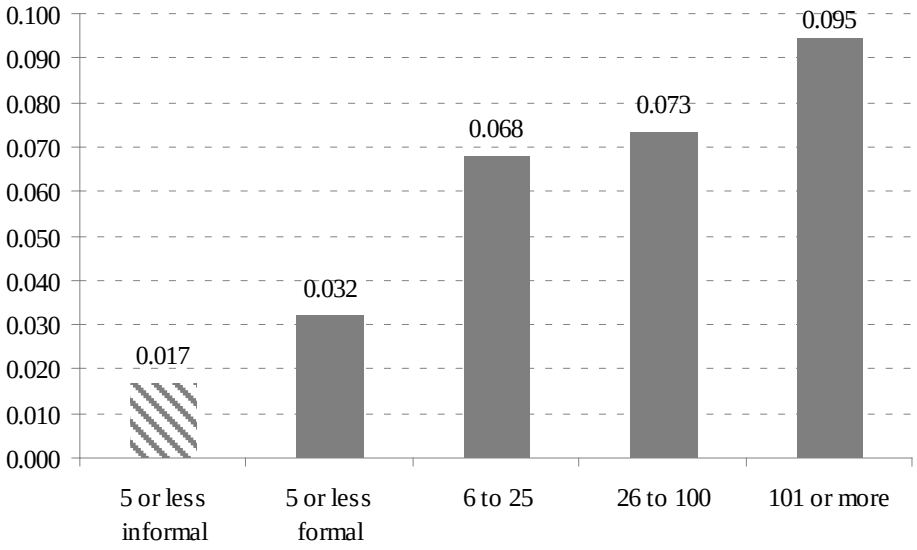
Table 6. Purchases of Fixed Assets over Sales by Country and Registration

Country	Registered firms	Non-registered firms
Argentina	0.1006	0.0145
Bolivia	0.0954	-
Brazil	0.1307	-
Chile	0.0714	-
Colombia	0.0596	-
Dominican Rep.	0.1199	-
Ecuador	0.0652	-
El Salvador	0.0674	-
Guatemala	0.0772	-
Honduras	0.1217	-
Jamaica	0.0220	-
Mexico	0.0300	-
Nicaragua	0.1039	-
Panama	0.1084	-
Paraguay	0.1012	-
Peru	0.0584	0.0186
Trinidad & Tobago	0.0547	-
Uruguay	0.0443	-
Venezuela	0.0483	-
Average LAC	0.0744	0.0169
Czech Republic	0.0679	-
Germany	0.0588	-
Greece	0.0410	-
Hungary	0.0403	-
Ireland	0.1659	-
Israel	0.0226	-
Poland	0.0445	-
Portugal	0.0411	-
Spain	0.0495	-
Turkey	0.1570	-
OECD sample	0.0799	-

Comparing investment between registered and nonregistered firms in LAC, there is a large difference between the two types of firms (7.4 percent versus 1.7 percent).[32] Restricting the comparison by country and firm size, we observe that while registered micro firms in Argentina and Peru invest 4.5 percent and 3.3 percent, respectively, non-registered micro firms in these countries invest 1.5 percent and 1.9 percent. These results are consistent with the rough idea that some firms that choose to evade taxes and regulations subsequently invest little and remain small to avoid being detected by tax inspectors.

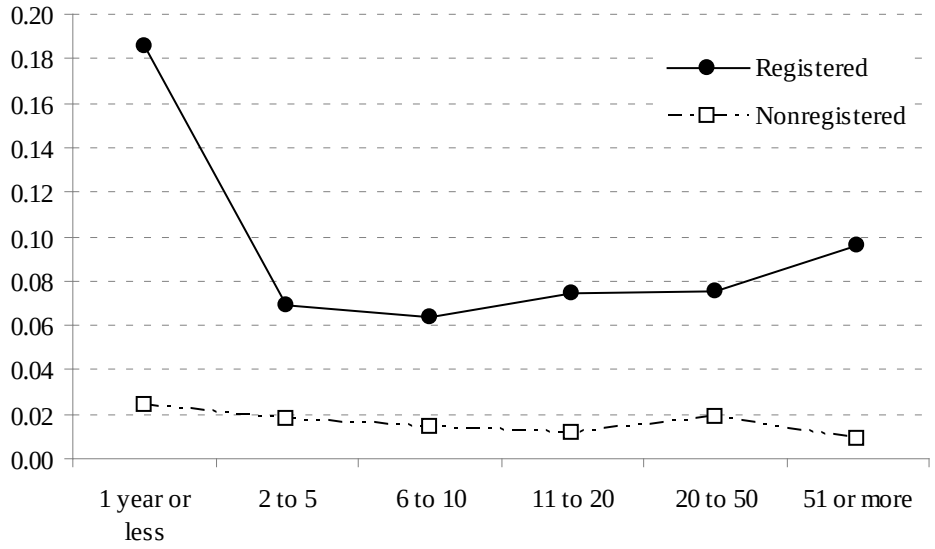
Figure 21 below shows a positive correlation between firm size and investment in fixed assets. While large registered firms invest more than 9 percent of their sales in fixed assets, the figure is only 3 percent among micro registered firms. Figure 22 shows that investment in fixed assets is higher among new firms as expected.

Figure 21. Purchase of Fixed Assets over Sales by Firm Size and Registration



[32] In Guatemala, although the informal survey was conducted, the observations for purchases of fixed assets are missing.

Figure 22. Purchase of Fixed Assets over Sales by Firm Age and Registration

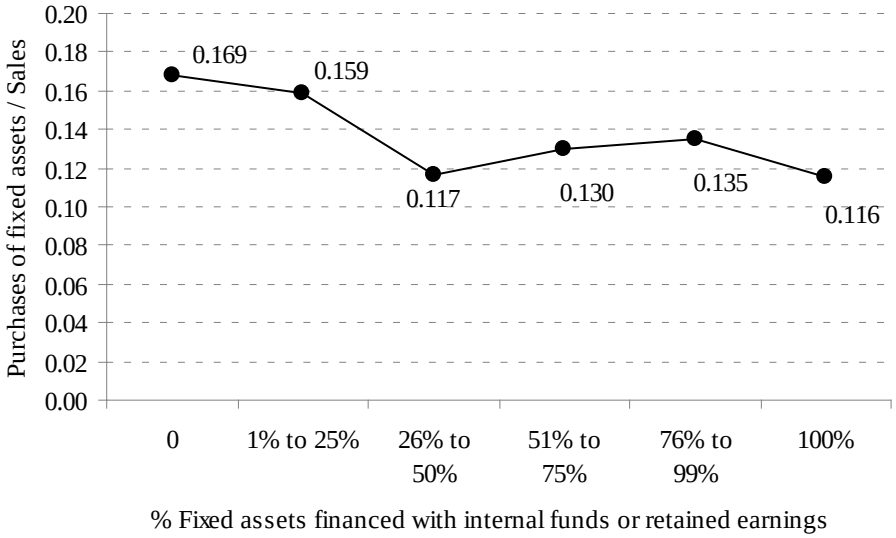


In fact, the sharp drop in investment after the first year may also indicate that a large share of those purchases may be related directly to set-up investment. Note that, after the tenth year of life, investment seems to increase slightly. The latter suggests that older firms may be involved in subsequent investment that would ensure their long-run sustainability, but of a very different nature than investment expenditures in the first year of life. This difference is clearly unidentifiable given that there is no question in the questionnaire about different types of investment expenditures.

Finally, Figure 23 explores the relationship between investment in fixed assets and the use of internal funds or retained earnings to finance them. Firms that rely more on internal funds tend to invest less (relative to sales). For example, firms that finance 100 percent of their purchases of fixed assets with internal funds only invest 11.6 percent of their sales, while firms that are able to finance their purchases of fixed assets entirely with external funds invest 16.9 percent of their sales. These results are consistent with the idea that undeveloped financial markets produce lower levels of investment.[33]

[33] Incidentally, this result may contrast with that in Bebczuk and Cavallo (2014), who find a positive correlation between the business-savings-to-output ratio and the business-investment-to-output ratio with macroeconomic data. Yet we do not claim a contradiction between the two results given that the database considered in this paper has a much smaller scope than macro data.

Figure 23. Purchases of Fixed Assets (as a share of sales) by Proportion of Purchase Financed with Internal Funds or Retained Earnings



5. Concluding Remarks

This paper has presented stylized facts about LAC firms' recent self-financing policies of fixed-capital investment and working capital using data from the World Bank Entrepreneur Survey for the period 2006 through 2010. Overall, those facts reveal that, although a large share of registered firms reports using retained earnings for these two purposes (about 58 percent for purchasing fixed capital assets), that share is not higher than in several OECD countries (and actually the average for LAC is slightly below that of those developed countries). Also, as a share of sales, the share of retained earnings destined to fixed investment tends to be very small. Another fact is that bigger registered firms tend to rely less on retained earnings to finance both types of investment. However, older registered firms do seem, if anything, to rely marginally more on retained earnings than relatively younger counterparts, the latter being inconsistent with a hypothesis of less tight borrowing constraints less for older firms, a prediction from part of the related theoretical literature. Yet registered firms do show a negative correlation between reliance on internal funds for both uses and the reported availability of a line of credit, which does seem consistent with the borrowing constraint hypothesis. Clearly, those two results call for more specific work (probably using much more detailed panel-data bases) to test more properly whether the reliance on retained earnings to finance investment is indeed related to borrowing constraints (and variables that determine the latter).

Regarding unregistered firms, the database only includes data on firms of three LAC countries. On average, there is a larger share of unregistered firms of those three countries relying (at least partially) on retained earnings for both uses than the average share for LAC registered firms. However, when comparing with small registered firms of the three countries included in the database, the share of unregistered firms relying on retained earnings is similar to that of such registered firms. The latter finding suggests that small registered firms (at least for those three countries) may face similar problems regarding financing investment as their unregistered counterparts. Some of them may include frictions generated by the presence of asymmetric information. Again, much more refined databases are needed to more properly test these types of hypothesis.

Finally, the behavior of the ratio between purchases of fixed assets and firm sales confirms that investment tends to be small for unregistered firms and larger for bigger, registered firms. Also, that investment measure is smaller for firms relying more on retained earnings for fixed asset purchases. Those two correlations tend to favor the hypothesis that investment may increase with lower costs of external financing associated with either agency costs or asymmetric information. However, there is no significant correlation between investment and firm age, casting some doubts on the empirical evidence of the investment-financing cost correlation explained above.

Despite the absence of sharper empirical results (originating in the limitations of the database used here) this paper weakly suggests future lines of research to obtain more definitive policy implications. For example, the negative correlation between reliance on retained earnings and availability of credit, on the one hand, and the negative correlation between investment and reliance on retained earnings for fixed capital purchases, on the other, suggests that policies intending to improve access to credit (especially for smaller firms) may have an impact on investment. In particular, improving the screening process for loan applications from small and/or younger firms may offer a means of increasing fixed capital purchases, as suggested by both results in the paragraph above. Some of the results in this paper also suggest the need to analyze more concrete policies to improve the quality of small and medium firm investment, especially for more mature firms. The finding of the sharp drop of investment after the first year of life of a firm and its mild increase thereafter suggests (as stressed above) that the main motivation for fixed capital purchases in the first year is related to set-up costs, and the sharp

drop of those purchases suggests that there is little investment in innovation to improve productivity when the firm matures. In line with ideas in Crespi, Fernández-Arias and Stein (2014),[34] several policies may improve access to credit for small businesses to allow for bigger increases in productivity. The behavior of investment across firms of different age suggests the plausibility of analyzing such policies.

However, cleaner (and more convincing) policy recommendations, as well as analysis of other important issues like the relationship between investment financing and ownership structure,[35] can only come from further work using a different source of data. Although the WBES has the advantage of being a fairly recognized standardized database, the disadvantage (especially, when focusing on LAC firms) seems, on the one hand, the absence of more specific questions regarding the types of investment spending (with the intended goal of measuring quality of investment) and, on the other hand, the absence of a wider and more continuous coverage of firms, especially for unregistered companies. The latter is the main reason for the absence of a more rigorous analysis of *causal* determinants for variables such as retained earnings used to purchase investment, given that the WBES (especially in the case of LAC firms) includes too few years of data to construct a proper panel database to properly identify and then estimate those causal determinants. The latter is left for future research when either more complete panel-databases become available or when randomized experiments allow such studies to be adequately performed to address causality more seriously.

[34] See, especially, Chapter 6.

[35] The empirical corporate finance literature has shown that ownership and governance influences variables related to internal finance, such as dividends (see, e.g., Gompers, Ishii and Metrick, 2010, for the U.S. case, Maury and Pajuste (2002) for the case of Finland, and Harada and Nguyen (2011) for the Japanese case). The WBES reports few questions on ownership structure, but the data show very little variability of variables like number of owners. Appendix 3 shows some descriptive analysis for both formal and informal firms. However, that lack of variability does not allow for sharper analysis of the impact of ownership data on investment and retained earnings behavior.

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Appendix 1. Enterprise Survey, Registered Firms, Latin American and Caribbean Countries

Country	Year	Number of Firms			
		Total	<20 employees	20-99 employees	100+ employees
Antigua and Barbuda	2010	151	94	51	6
Argentina	2006	1,063	407	392	264
Argentina	2010	1,054	336	395	323
Bahamas, The	2010	150	70	55	25
Barbados	2010	150	49	62	39
Belize	2010	150	79	61	10
Bolivia	2006	613	300	223	90
Bolivia	2010	362	124	145	93
Brazil	2003	1,642	295	886	455
Brazil	2009	1,802	678	750	374
Chile	2006	1,017	319	438	260
Chile	2010	1,033	303	394	336
Colombia	2006	1,000	524	363	113
Colombia	2010	942	349	326	267
Costa Rica	2005	343	217	86	40
Costa Rica	2010	538	199	216	123
Dominica	2010	150	103	43	4
Dominican Republic	2010	360	116	133	111
Ecuador	2006	658	285	254	119
Ecuador	2010	366	128	139	99
El Salvador	2006	693	277	255	161
El Salvador	2010	360	124	120	116
Grenada	2010	153	99	41	13
Guatemala	2006	522	210	197	115
Guatemala	2010	590	221	185	184
Guyana	2010	165	51	72	42
Honduras	2006	436	206	130	100
Honduras	2010	360	182	111	67
Jamaica	2010	376	140	169	67
Mexico	2006	1,480	738	448	294
Mexico	2010	1,480	502	472	506
Nicaragua	2006	478	277	155	46
Nicaragua	2010	336	154	124	58
Panama	2006	604	347	182	75
Panama	2010	365	129	161	75
Paraguay	2006	613	313	243	57
Paraguay	2010	361	128	160	73
Peru	2006	632	264	251	117
Peru	2010	1,000	318	379	303
St. Kitts and Nevis	2010	150	82	60	8
St. Lucia	2010	150	79	55	16
St. Vincent & Grenadines	2010	154	110	38	6
Suriname	2010	152	66	77	9
Trinidad and Tobago	2010	370	166	103	101
Uruguay	2006	621	296	234	91
Uruguay	2010	607	244	208	155
Venezuela, RB	2006	500	332	119	49
Venezuela, RB	2010	320	160	113	47
Total		27,572	11,190	10,274	6,102

Appendix 2.

Figure A2.1

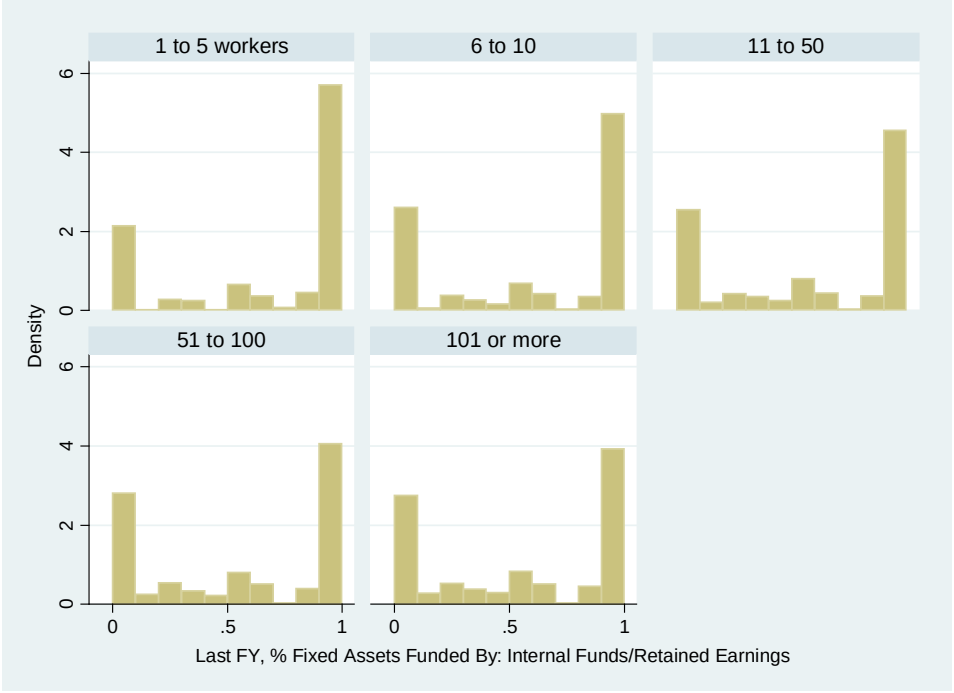
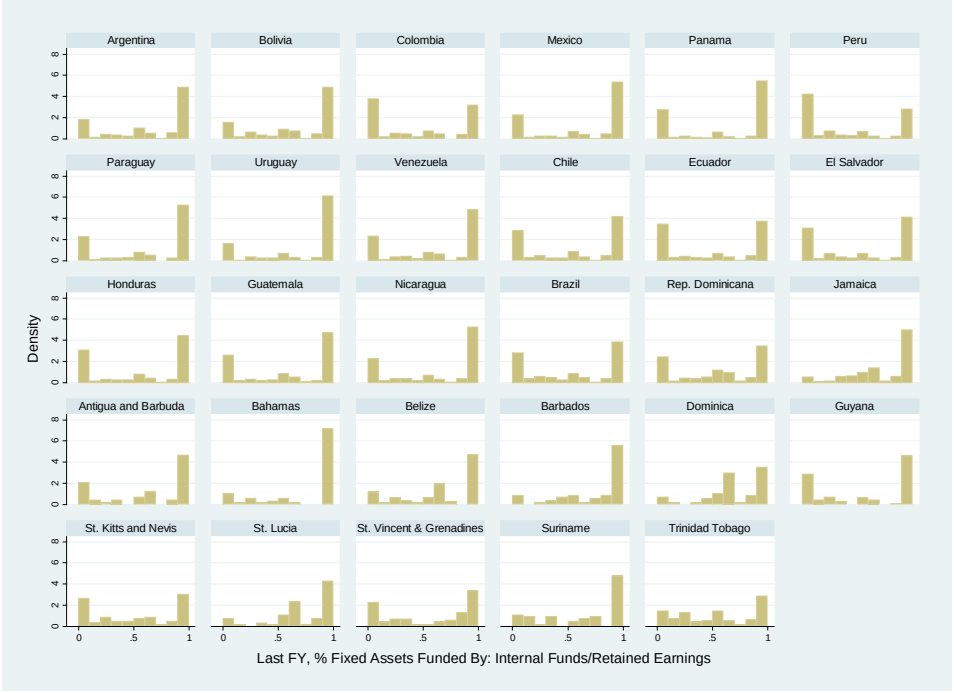


Figure A2.2

Figure A2.3



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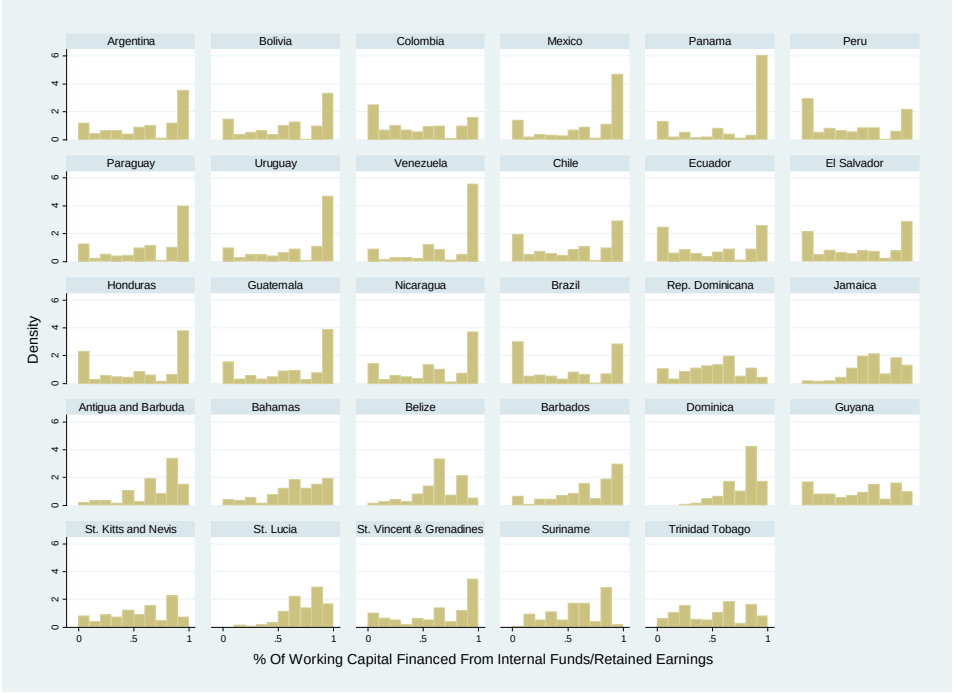


Appendix 3. Ownership Structure and Corporate Savings

Our initial objective was to explore how ownership structure affects firms' savings and investment decisions. In particular, we sought to learn how the separation of ownership and control matters. However, data for this last variable are only available for a few non-registered firms, and none of the registered firms provide information about this issue. Therefore, we decided to provide some stylized facts only for single ownership. Next we discuss how it is measured.

The Formal Enterprise Survey includes the following two questions:

What is the firm's current legal status?

- *Sole proprietorship*
- *Shareholding*
- *Partnership*
- *Limited partnership*
- *Others*

What percentage of this firm does the largest owner own? (This question is only asked of those who do not respond "sole proprietorship" in the previous question).

The Informal Enterprise Survey, on the other hand, asks: *How many owners does this business have?*

Figure A3.1 shows the cumulative distribution of ownership for registered firms, assuming that sole proprietorship owns 100 percent of the firm. Approximately one third of the firms have a single owner, in another third the largest owner owns between 50.1 percent and 99.9 percent of the firm, and in the remaining third the largest owner owns 50 percent or less of the firm. That is, there is a sufficiently high number of firms that have a single owner, and that have more than one, to empirically explore the impacts of ownership on savings.

Figure A3.1. Cumulative Distribution of Firms by Ownership, Registered Firms

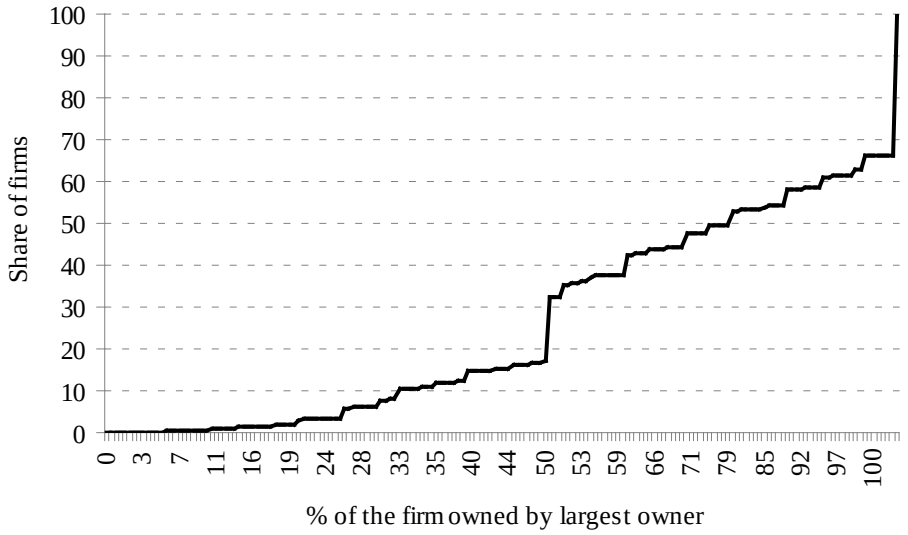
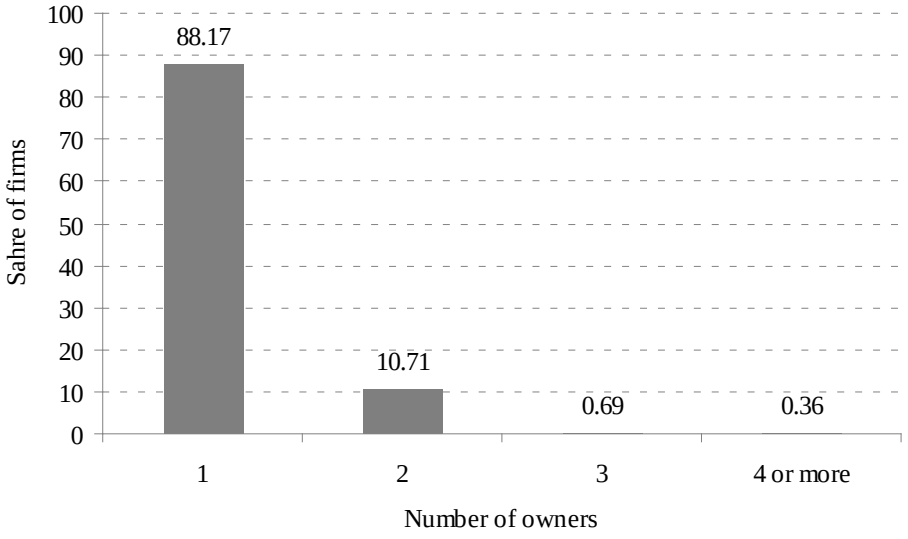


Figure A3.2 shows the distribution for nonregistered firms, and in this case there is little variation. Almost 90 percent of firms have a single owner.

Figure A3.2. Distribution of Firms by Ownership, Non-Registered Firms



The other variable of interest is separation of ownership and management. The Enterprise Survey asks the following question: Is the largest owner also the main decision maker of this business? Almost 97.5 percent of nonregistered firms report that the owner is also the main decision-maker, and only 2.5 percent report the contrary. Regrettably, this question is only included in the Informal Survey questionnaire as mentioned above.