Is Business Saving Really None of Our Business?

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Abstract[*]

This paper investigates the relevance of business saving for private saving and investment around the world by constructing and exploiting a broad international, unbalanced panel of 64 countries over 1990-2012. The paper shows that businesses are the main contributors to private and national saving around the globe, contributing on average more than 50 percent of national saving. Using this unique dataset, evidence is found of partial piercing of the corporate veil: for the core estimation, it is found find that a $1 increase in business saving gives rise to a decrease of only $0.28 in household saving. The non-neutrality of business saving is further confirmed by results showing that higher business saving is significantly associated with higher business investment. In conjuction with the empirical results, this paper sheds new light on the role of business saving in the economy by critically scrutinizing the existing macroeoconomic and corporate finance literatures.

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1. Introduction

The Chinese saving rate in the late 2000s reached an impressive record of 54 percent of GDP, half of which was generated by the corporate sector (see Huang, 2011). In Latin America, 74 percent of the private saving rate in Chile in 2011 had the same origin (see Central Bank of Chile, 2013). According to IMF (2006), businesses accounted for 70 percent of private saving in G7 countries in the early 2000s, up from 50 percent in the early 1990s.

In light of these figures, it is no wonder that business saving (defined as cash flows –net revenues plus depreciation- minus dividends) plays a primary role in corporate investment.[1] In fact, these retained earnings appear to be by far the main source of business financing. Fan, Titman and Twite (2012) compile data on more than 36,000 listed firms in 39 countries in 1991-2006 to conclude that the median debt-to-assets ratio in developing countries is just 26 percent, implying that three-quarters of total assets are paid for with equity, most of it internally generated. For six big Latin American countries in 2009, Bebczuk and Galindo (2010) also find this ratio to be 26 percent. For developed economies, the number is even lower (20 percent), suggesting that heavy reliance on internal funds cannot be traced to differences in institutional, economic or financial development, and it affects big, listed firms as well as small firms. If anything, this reliance stands out as an international stylized fact.

Instead of looking at stock variables (total debt and assets), flows can be examined to see if these conclusions still hold. They do. Ayyagari, Demirgüç-Kunt and Maksimovic (2010) present data from the Enterprise Surveys administered by the World Bank on some 40,000 firms in 67 countries. They report that internal funds cover 59.2 percent of financing needs in low income countries, 59.3 percent in middle income countries, and 58.2 percent in high income economies. For Latin America, this percentage is 60.5 percent. Much in line with the previous stock data, this pattern looks unrelated to country group characteristics and holds regardless of firm size. Beck (2007) also uses the Enterprise Surveys for 71 developing countries to show that internal funding covers 66 percent of investment in small firms (less than 20 workers), 60 percent in medium firms (20-99 workers) and 58 percent in big firms (100+ workers). As small firms tend to be informal for the most part, these self-financing ratios hint that informality, a

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[1] Just to be clear, business saving forms part of private saving along with household saving. National saving is the sum of private saving (business plus household) and public saving. Business saving is sometimes referred to as corporate saving, retained earnings, undistributed cash flows, internal funds, or own funds.

widespread phenomenon across Latin America, is not the sole factor giving rise to a link between business investment and saving.

These figures notwithstanding, the saving of businesses remains a largely obscure and neglected topic in the macroeconomic literature. As far as saving studies are concerned, the bulk of the empirical work leaves aside business saving. For instance, Loayza, Schmidt-Hebbel and Servén (2000), one of the more influential studies on private saving in the last 15 years, plainly omits the discussion of business saving. More recently, the same goes for Horioka and Wan (2006), Mody, Ohnsorge and Sandri (2012) and Aizenman and Noy (2013). In the Latin American context, two recent reports on saving in the region, yet looking at the interplay between private and public saving, do not cover business saving separately (see IDB, 2013, and CEPAL, 2013).

With a focus on Latin America, but covering a broader set of countries, this work seeks to fill this gap by tackling three central questions: i) why should business saving be front and center in the analysis of national saving?; ii) how has business saving behaved in Latin America and around the world in the last two decades?; and iii) what is the empirical link of business saving with overall private saving, on one hand, and with business investment, on the other?

In order to meet these goals, we will review the existing international literature on the subject and put together a novel saving and investment dataset by institutional sector (households, businesses, and the government) for Latin America and other emerging and developed countries before producing new econometric evidence on the macroeconomic role of business saving.

The paper will be organized as follows. In Section 2 we will go over the literature. In Section 3 we will describe the main trends emerging from our newly constructed saving and investment dataset. The empirical models explaining business saving and its relationship to national saving and investment will be set up and estimated in Section 4. Section 5 will close with a thorough assessment of whether business saving should be stimulated or not, and the proper policy tools to be employed in either case.

2. Literature Review

By critically scrutinizing the existing macroeconomic and corporate finance literatures, this section aims to address two issues that are key to the empirical analysis to be carried out later in this paper: i) is there any meaningful relationship between corporate and overall private saving? and ii) is the intensive use of internal funding a suboptimal phenomenon resulting from inhospitable financial market conditions? As shown next, the answer to these questions defies conventional wisdom in more than one regard.

As pointed out in the Introduction, the body of economic research on business saving is remarkably scarce, even more so when compared with the profuse literature on private and national saving. Two implicit assumptions and one practical fact seem to lie behind this disdain for the topic and the answer to question i) above.

2.1 The Corporate Veil

Building on the basic circular flow model, the first assumption is that households save but do not invest, while firms invest but do not save. This assumption can be quickly ruled out after noticing, as observed in the Introduction, that businesses account for no less than 50 percent of private and national saving. The second assumption is that, even if not negligible, business saving is irrelevant to determining private saving, as households pierce the corporate veil, an issue to be discussed briefly in this section and momentarily and then resumed in Section 4. For now, it suffices to say that the bulk of the evidence runs counter to this assumption, meaning that changes in business saving do have an impact on private and national saving.

Finally, the practical fact has to do with the limited availability of business saving statistics, in turn associated to the lack of comprehensive balance sheet data on the business sector, especially in developing economies. While long time series on private and public saving are available for most countries, a much more restricted group has managed to produce and maintain business sector information. In that sense, the information collected for the present paper intends to overcome to some degree this constraint in Latin America.

In light of the widely different status that the macroeconomics and the corporate finance literature attach to business saving, we will review them separately. In the macroeconomic branch, the seminal scholarly paper drawing direct attention towards business saving is Poterba

(1987).[2] After noting that corporations accounted for 50 percent of private saving in the 1960s as well as in the 1980s, Poterba goes on to posit the corporate veil hypothesis, according to which households take full account of the saving made by businesses on their behalf—that is, households pierce the corporate veil.

The argument relies on the fact that households are the ultimate owners of firms, and thus they adjust their saving plans in the face of changes in business saving. Under the permanent income theory, consumption decisions are based on the present value of labor income and dividend revenues. If firms change their current saving by, say, increasing current dividends, households would not modify their initial desired consumption and saving because, for a given present value of profits, higher present dividends would be compensated by lower future dividends, leaving permanent income unaltered. Consequently, the additional dividends will be fully saved, implying a complete offset between diminished business saving and increased personal saving. In other words, private saving does not change because the private sector's intertemporal budget constraint does not change either, and therefore the split between household and business saving is immaterial for any policy purpose.

However, Poterba (1987) acknowledges the various empirical shortcomings that can invalidate the full piercing of the corporate veil. Most prominently, empirical outcomes can depart from theory in the presence of asymmetric information and bounded rationality. Asymmetric information in financial markets can lead to household financial constraints, under which they will be prone to spend all or part of the extra current disposable income made available by increased dividends. In turn, bounded rationality may make people unconcerned about the future and adopt myopic consumption strategies solely based on current disposable income (see Bebczuk, 2000).[3] The resulting empirical prediction is that an increase (reduction) in business saving will give rise to an increase (reduction) in private saving. If such neutrality is

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[2] As a matter of fact, Poterba (1987) cites a pioneering paper by Edward Denison (1958) that uncovers a higher stability of gross private saving vis-à-vis household and business saving, a phenomenon that Denison interprets as evidence of offsetting between the latter two.

[3] By making any predictions about the future imprecise and unreliable, excessive economic volatility is also likely to cause shortsightedness. Uncertainty also affects consumption via a higher propensity to consume out of cash dividends vis-à-vis capital gains, as the latter tend to have a larger temporary component than dividends, whose changes are usually of a more permanent nature (see Campbell, Lo and MacKinlay, 1997). This problem is exacerbated when secondary capital markets are illiquid and/or inefficient, or stock holdings cannot be used as collateral in borrowing from the banking system, because in those cases capital gains become poor substitutes for cash dividends.

broken, movements in business saving may prove to be a powerful instrument in changing national saving.[4]

A handful of papers have investigated the empirical nexus between household and business saving, concluding for the most part that the corporate veil holds, but only partially. Poterba (1987) finds for the U.S. over 1950-1986 that a $1 change in business saving translates into an approximately $0.30 change in the same direction in private saving. IMF (2006) documents the relentless increase of business saving in the G7 since 1970, both as a ratio of GDP (from about 8 percent in 1970 to 12 percent in 2004) and a ratio of total private saving (from 44 percent to 73 percent between those years). Although a graphical analysis suggests a compensating effect between household and business saving, this paper does not pursue any econometric estimation. IMF (2009) observes similar behavior in Asian emerging countries, and in this case a panel regression delivers an offset coefficient of 0.8, even though the result for a broader set of emerging economies proves non-significant.[5] Bebczuk (2000) looks at the seven largest countries in Latin America during 1990-1996 and obtains a coefficient of 0.61.

2.2 Business Saving, and the Pros and Cons of External and Internal Finance

Contradictory answers have been offered from the macroeconomics and corporate finance fields to the second question posed at the start of this section (*Is the use of business saving suboptimal vis-à-vis intermediated funds?*). Macroeconomics has generally endorsed the position that internal funding is a suboptimal response to underdeveloped financial markets, while corporate finance takes it as a profit-maximizing alternative. Our sense is that, all in all, corporate finance provides a more sensible approach to the issue under study. To organize the exposition, the macroeconomic approach to external and internal financing will be summarized first, and then it will be compared with the corporate finance approach.

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[4] The reader may easily find several points in common between the corporate veil and the Ricardian equivalence hypotheses. While the former deals with the offset between household and business saving, the latter addresses private and public saving.
[5] These papers run private saving regressions adding business saving as a regressor, without digging deeper into the drivers of business saving per se. In a sense, they study the corporate veil without fully piercing it. See later in this paper, however, the brief discussion on corporate liquidity decisions.

2.2.1 The Macroeconomic View

Macroeconomics has been converging on the currently prevailing paradigm of imperfect capital markets since the 1990s, but only at a slow pace. Despite the progress made in the finance field since the late 1970s, the Modigliani-Miller assumptions dominated macroeconomic modeling and teaching well into the 1980s and early 1990s. As an example, leading advanced macroeconomics textbooks, such as Blanchard and Fischer (1989) and Mankiw (1996), do not mention business saving explicitly.[6]

Since the early 1990s, macroeconomists have become interested in the implications of credit market depth on the level and productivity of investment. Expanding on the cross-country economic growth regression developed around the late 1980s, King and Levine (1993) set off the prolific finance-and-growth literature.[7] This and successive research have typically found a positive link between per capita growth and financial development.[8]

In contrast, there has been comparatively much less analysis of the role of business saving in investment, productivity and growth. In our view, this is largely explained by the (mis)conception prevalent in the macroeconomic literature that self-financing by firms is always a suboptimal form of financing.[9] This stand might likely have spread as a misguided corollary from the finance-and-growth research: if external finance is good for growth, internal finance could not be.[10]

Even so, some macroeconomic policy-oriented papers have recently underscored the role of business saving. In looking at some myths about the origin and resolution of the 2008 U.S. financial crisis, Chari, Christiano and Kehoe (2008: 4) bring to light the fact that "*...the typical firm can finance its capital expenditures entirely from retained earnings. It is difficult to see how disruptions in financial markets will directly affect investment decisions by a typical firm.*"

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[6] Sachs and Larraín (1993) is a notorious exception, as it presents a didactic, introductory discussion on the corporate veil.

[7] McKinnon (1973) is an early warning call about the growth-reducing effects of a poorly developed banking system in developing countries, and one that had widespread intellectual influence on the implementation of financial liberalization reforms since the mid-1970s.

[8] Despite the popularity of this hypothesis, various caveats remain regarding causality, financial deepening proxies, and long- versus short-term effects. See on this Cecchetti and Kharroubi (2012) and Bebczuk and Garegnani (2007), among others.

[9] For the sake of illustration about the alleged suboptimal substitution between external and internal finance, IMF (2009: 57) asserts *"In countries where market-financing options are plentiful and firms are able to raise capital readily from banks and capital markets, the motivation for retaining high levels of corporate earnings is lessened."*

[10] The financial repression syndrome, first investigated by McKinnon (1973), also instilled that firms were suboptimally confined to self-finance as a consequence of shallow financial markets.

Armenter and Hnatkovska (2011) look for explanations of the fact that the U.S. corporate sector became a net lender in the 2000s, and, based on actual data and a theoretical model, they propose the rise in business saving as the main explanatory factor.

Moreover, the scant macroeconomic evidence available suggests a positive link between business saving and growth. For instance, in order to explore in a more explicit fashion the link between retained earnings (business saving) and economic growth, Bebczuk and Garegnani (2007) compile an unbalanced panel of 15 OECD countries over 1970-2003 and calculate a corporate self-finance coefficient, defined as the ratio between business saving and corporate investment. The mean of this coefficient yields an impressive 91.5 percent, with an increasing trend over time, from 73 percent in 1970 to 100.1 percent in 2003.[11] The panel estimation lends support to a positive long-run effect of this coefficient on the rates of investment, GDP growth and total factor productivity growth.

In the international finance arena, Aizenman, Pinto and Radziwill (2007) calculate that 90 percent of the tangible capital stock in developing countries is self-financed, meaning that only the remaining 10 percent is funded with foreign saving. This kind of evidence is closely related to the celebrated Feldstein-Horioka puzzle about the strong correlation between national saving and investment (see Feldstein and Horioka, 1980, for the seminal presentation, and Bebczuk and Schmidt-Hebbel, 2010, for an update and several methodological refinements).[12] These papers reflect once more the still profound disconnect between macroeconomics and finance, because neither of these papers look for answers or clues from the corporate finance literature, the natural place to begin.

A more vivid, yet also indirect, interest in business saving has awakened in the last decade in the context of the general equilibrium macroeconomic models. Rather than business saving in itself, some of these models have introduced financial frictions as a key feature to explain particular macroeconomic phenomena. Gomes (2001) is acknowledged to be one of the first general equilibrium models explicitly dealing with corporate borrowing constraints, with the goal of checking in a broader analytical framework the robustness and shortcomings of reduced-

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[11] This value can exceed 100 percent because business saving may finance not only fixed asset accumulation (investment) but also asset accumulation in general.

[12] Bebczuk and Schmidt-Hebbel (2010) estimate Feldstein-Horioka coefficients at the sectoral level (households, firms and government) for high income countries over 1970-2003. Interestingly, they find a large and significant national coefficient (although decreasing throughout the period, from roughly 0.8 to 0.5), but low and generally non-significant sectoral coefficients. This might be a result of compensation through current account targeting, corporate veil and Ricardian equivalence, and/or a combination of high intra-national and low international capital mobility.

form empirical tests in the tradition of Fazzari, Hubbard and Petersen (1988). Other recent contributions have been concerned with the growth implications of financial frictions. In this spirit, Midrigan and Xu (2014) study, with a parameterized macroeconomic model, the influence of financial frictions on total factor productivity (TFP). They posit that financial frictions prevent the rate of return from equalizing across sectors (a misallocation effect) and that they distort entry and technology adoption. They find the quantitative impact to be much larger for the latter than for the former channel, a result that the authors associate with the availability of internal funds: efficient producers can elude financial constraints by resorting to their internal funds, avoiding the misallocation problem, but entrants and even incumbent producers with sizable financing needs are unlikely to have accumulated sufficient internal resources. Their study is close in framework and results to Buera, Kaboski and Shin (2011). Blaum (2013) focuses on the role of wealth inequality and its effect, via financial frictions and collateral requirements, on the expansion of sectors with high external finance dependence. Karabarbounis and Neiman (2012), in turn, relate the substantial global decline in the labor share over the last 30 years to a fall in the cost of capital and the intensive use of business saving to finance the physical capital expansion.

2.2.2 The Corporate Finance View

Within the realm of finance, the study of financing decisions takes a quantum leap after the groundbreaking models of asymmetric information in the late 1970s and early 1980s. Prominent contributions, among many others, are the credit rationing model of Stiglitz and Weiss (1981), the pecking order model of Myers and Majluf (1984) and the debt overhang model by Myers (1977). On the empirical front, Fazzari, Hubbard and Petersen (1988) set up a simple and potent test of financial constraints. They claim that the sensitivity of business investment to cash flows, after controlling for expected profitability, suggests a financial constraint, in that the perfect substitution between internal and external financing (à la Modigliani-Miller) breaks down. They obtain a positive and significant loading for cash flow for firms expected to be constrained (for example, smaller and non-dividend-paying firms).

Based on the latter framework, several hundreds of empirical applications have been produced over the years and for a large number of developed and developing countries, delivering similar results (see Hubbard, 1998, for a survey, and Galindo and Schiantarelli, 2003,

for Latin American evidence).[13] These findings have not been immune to criticisms, though, generally revolving around the observation that cash flows might contain relevant information about investment opportunities. If that is true, the estimated cash flow coefficient would be biased upward (see, among others, Kaplan and Zingales, 1997, Gomes, 2001, and Almeida, Campello and Weisbach, 2004). However, judging from its widespread influence up to this day, the test largely remains a useful and credible proof of financial constraints.

Another way of studying self-financing is by looking into corporate dividend policies; after all, business saving equals undistributed cash flows. Once more, the work on dividends tilts towards the view that cutting dividends is an optimal response for addressing investment financing needs. Fama and French (2001) study U.S. listed firms to find that the staggering decline in the number of dividend-paying firms since the 1970s is related, among other factors, to the emergence of good internal investment opportunities (as measured by Tobin's q). Bebczuk (2007) encounters similar evidence for Argentina on the negative link between payout ratios and Tobin's q.

The empirical capital structure literature yields results fully consistent with those above. This should not be shocking at all, as under financial frictions investment, financing and dividend policies cease to be independent of each other. In exploring the drivers behind changes in the leverage ratio (financial debt to net worth, or to assets), the seminal work of Rajan and Zingales (1995) for G7 economies shows that debt ratios are lower for firms with higher ROA, supporting the pecking order corollary that profitable companies prefer using their own funds, despite the fact that such good performance would crack open the door to external funding. Thus, the negative association uncovered by these reduced-form equations implies lack of demand rather than constrained supply of credit. Similarly, they prove that firms with high Tobin's q also display lower leverage, which would indicate that these firms strive to keep current debt in check to be able to exploit expected good prospects (the debt overhang phenomenon). Again, this choice is motivated by voluntary, profit-maximizing arguments, not by restrained access to credit. Mitton (2008) confirms these findings for 34 emerging markets, including several Latin

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[13] Islam and Mozumdar (2007) is one of those papers. They get favorable evidence for listed firms in general in 31 countries in 1987-1997. It is worth mentioning that if listed firms—the elite of firms in terms of transparency—display financial constraints, one should expect more severe constraints for other firms.

American economies. This paper also makes the point that corporate leverage bears no significant correlation with the level of financial development in the country.[14]

A closely related, but still distinct, research strand has focused on corporate liquidity. Decisions on cash holding must not be confused with business saving decisions: business saving (net revenue plus depreciation) can be allocated to fixed assets or current assets, and cash appears as part of the second category—in fact, firms can accumulate cash with or without saving.[15] While there are no papers delving into the determinants of business saving per se, some research has been concerned with the accumulation of corporate liquid assets. Almeida, Campello and Weisbach (2004) explore the reasons why corporations hold liquid assets above and beyond the cash flows paid out to shareholders and those reinvested in the firm. They state (and find confirming econometric evidence) that there exists a positive cash sensitivity to cash flows, whereby financially constrained firms tend to hoard more cash when they have more cash flows, in anticipation of future borrowing constraints (and provided the profitability of future investment opportunities surpasses that of the current ones being passed up by keeping liquid assets). Riddick and Whited (2009) is another contribution along the same lines, but they argue that under persistent productivity shocks the firm might choose to invest today, rendering the above sensitivity negative. In any case, they conclude that precautionary cash balances are higher the higher is the cost of external finance, the uncertainty faced by the firm and the lumpiness of the firm's investment projects. Bates, Kahle and Stulz (2009) call attention to the noticeable increase of the cash-to-assets ratio in the U.S. during 1980-2006 and advance the precautionary saving motive as the chief explanation. Huang (2011) adopts the same argument and employs firm-level data on Chinese firms to explain cash savings.

2.2.3 Contrasting the Macroeconomic and Corporate Finance Views

When it comes to business saving, it looks clear that the corporate finance research has gone a much longer way than its macroeconomic counterpart. Some common misconceptions in the macroeconomic approach to business saving and financial markets in general have long been addressed in a largely satisfactory fashion thanks to the application of the asymmetric

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[14] Capital structure research also lends indirect support to the view that banks and markets prioritize firms with well-documented ability to repay. According to these studies, the debt ratio is higher for larger firms with more tangible assets (see Frank and Goyal, 2008, for a review).

[15] An example of this mix-up between cash hoarding and business saving is IMF (2006), which titles the piece "Awash with Cash: Why Are Business Savings So High?"

information framework (and behavioral economics as well) to financial contracting. Besides, some of the conclusions from the macroeconomic view are still empirically fragile.

As argued above, compared with finance research, macroeconomics has taken a much more favorable stand towards debt and a less favorable one towards internal funding. In a nutshell, financial economics takes market imperfections as granted, and thus visualizes the observed heavy reliance on internal funding vis-à-vis external sources around the world as an optimal corporate choice subject to that constraint.[16] On the contrary, macroeconomists for the most part see the use of internal funding as a manifestation of intrinsic distortions brought about by informational frictions that should be removed to give way to a growth-enhancing, more prevalent role of financial intermediation.[17] In the macroeconomic tradition, funds channeled through specialized intermediaries (banks and markets) would have a larger impact on overall productivity, a point that finance implicitly rejects. As a matter of fact, both strands reach such opposing conclusions on the basis of the same theoretical background, namely, the asymmetric information model. Therefore, the dissent is more a matter of interpretation than a case of irreconcilable differences.

Our reading is that, in order to invigorate investment and growth, the secret, if any, is not to try to reduce business saving to promote financial intermediation. Far from that, these sources must be seen as complementary rather than substitutes. At any rate, if the goal is to stimulate financial intermediation, the way to go is to foster a higher volume and proportion of household saving being channeled towards the financial system, without creating barriers to business saving decisions. More outside financing would certainly expand the set of profitable corporate investment opportunities.[18]

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[16] As argued later, no policy reform would be able to fully remove this constraint: even if asymmetric information problems disappear, intermediated saving would still be more expensive than internal saving, implying that firms should prefer the latter.

[17] Huang (2011: 2), in investigating the astounding surge of business saving in China since the 1990s, embraces this negative view by asserting *"... China should manage high corporate savings by raising the costs of factor inputs (including capital), widening corporate ownership, boosting dividend payouts, and increasing competition in domestic markets."*

[18] Based on some simplifying assumptions, Demirgüç-Kunt and Maksimovic (1998) show that about 50-60 percent of listed firms in 30 countries grow faster than the rate at which they would grow in the absence of external financing. Moreover, they produce evidence that firms in countries with a better institutional framework for the functioning of the financial system display a larger reliance on external finance. Applying the same framework, Quicazán Moreno (2012) concludes that financial deepening in Colombia has favored the growth of Colombian firms.

The choice of an optimal capital structure among debt, internal funds and outside equity is anything but obvious, as they all carry benefits and costs in the quest to maximize shareholder wealth (see Bebczuk, 2003). Relative to debt, the use of internal funds display four advantages:

1. Internal funds are uncontaminated by intermediation and information costs disturbing external finance markets, thus becoming the least expensive source of financing, as forcefully stressed by the pecking order theory (see Myers and Majluf, 1984). Creditors typically respond to the information gap by raising the interest rate, shortening loan maturities and setting strict documentation and collateral requirements;

2. Since all risks are borne by the entrepreneur, the distorted incentives linked to limited liability are contained. In particular, beyond some threshold, a high debt ignites a conflict of interest between creditors and borrowers, whereby the latter might lean toward riskier projects (asset substitution) or just pass up good investment opportunities (debt overhang; see Myers, 1977) ;

3. Equity in general does not create a fixed obligation for the firm, reducing default risk in the face of adverse shocks;

4. Possessing high cash flows can even ease the access to the debt and stock market, as they signal good prospects and commitment toward more conservative investments.

These drawbacks of debt stress the policy relevance of separating the supply and demand motives behind the actual use of debt. Around the world, a preconceived policy prescription is that firms, especially the smaller ones, are credit constrained, in the sense that the available supply of loans falls below the existing demand. When the above elements are factored in, it becomes clear that the limited use of debt may be due to weak demand as well. The data presented in Beck (2011), based on all World Bank Enterprise Surveys between 2005 and 2009, provide preliminary support for this claim. For instance, just 28 percent of small firms (20 workers or less) use loans, which a priori indicates a shortfall of credit. However, when asked if finance is a severe obstacle for growth, a slim 17 percent of them responded positively. Relatedly, of all the firms that not having applied for a loan (51 percent of the whole sample), 56 percent reported that they did not need a loan. Assuming, without further evaluation, that all

smaller firms suffer are supply-constrained, leads to an inefficient over-expansion of state credit programs.

This is not to say that debt cannot play an invaluable role as an engine of business growth. When the capacity of generating internal funds is depleted but profitable projects are yet to be undertaken, debt and other forms of outside finance can very much improve business growth prospects. In the case of newly founded enterprises, this need obviously becomes more pressing.

The notion that financial intermediation is growth-enhancing (relative to the non-intermediation scenario) is rooted in the inaccurate assumption that all private saving is made by households.[19] If that were true, the absence of a financial system would involve millions and millions of small and decentralized loans from surplus households to firms and other households in search of funding. This bilateral and atomized lending activity would surely be inefficient (due to diseconomies of scale) and entail sizable undiversified risks and low productivity because of the inability of the typical household to select good borrowers and then control them until repayment. In some other cases, lacking good outside opportunities to invest in, or a bank to delegate this task to, households reinvest their saving in low-productivity activities of their own.[20] As banks and markets aggregate saving and have a comparative advantage in minimizing informational and transaction costs, the amount and quality of investment are both bound to be larger.

But things look utterly different if we accept the more realistic assumption that firms can and do save. Faced with an external finance premium, a rational entrepreneur would retain part of the cash flows generated to cover his investment. Recalling that internal funds are free from intermediation costs and informational frictions, it is both privately and socially optimal to exhaust them before resorting to external finance. This result holds even under perfect information, as intermediation costs will still be present, via an interest rate spread, to support the

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[19] Another popular belief is that the deeper the financial system, the larger the volume of credit and physical investment in the economy. Here the mistake has to do with aggregate consistency: total investment always equals total saving (net of intermediation costs). The financial system does not modify this identity. At most, the money multiplier increases the gross amount of credit, but the net amount of credit depends on the volume of saving in the economy that is relinquished to such intermediaries. Banks create credit, but for each additional dollar of credit there must be an additional deposit, which in the aggregate cancels out.

[20] McKinnon (1973) present the example of a poor rice farmer, who decides to store seed for next year in his barn, but the seed goes bad.

operation of the financial system.[21] In other words, the financial system is undeniably helpful at allocating household saving, but firms are undeniably better than banks at allocating their own saving. The problem is not the abundance of business saving but the scarcity of intermediated household saving.[22]

Let us think the problem in a slightly more formal way. Suppose that r_i is the opportunity cost of internal funds (say, the deposit interest rate), r_e is the required return by outside investors, or cost of external funds (say, the loan interest rate), and $f'(k)$ is the marginal productivity of capital, where k is the capital stock and $f''(k)<0$. Assuming financial frictions ($r_i < r_e$) and that $f'(k)$ is high enough, firms will minimize their overall cost of capital by exhausting their internal funding, and then will tap external markets up to the point at which $f'(k) = r_e$.[23] If the intensity of the financial friction somehow lessens (for example, as a result of a more creditor-friendly legal and economic environment), r_e would go down and thus investment will go up. But as long as $r_i < r_e$ —which, as stated before, is the most likely scenario—firms will keep on relying on their own resources to the extent possible and only then would try to obtain external financing. Comparing the two situations, the level of internal funding would remain the same, but external resources backed by household saving would likely increase. As this sketch of a model illustrates, business saving is the optimal choice for the firm and not a poor substitute for outside financing. Ameliorating financial frictions would increase the ratio of external to internal funding, but only because of improved conditions for the intermediation of household saving.[24]

Throughout the discussion it was sensibly assumed that business owners are rational profit maximizers, which guarantees that they will choose the best use for the firm's resources, that is, reinvest if the internal return exceeds outside returns and pay them out if otherwise. But if they display overconfidence, loss aversion or other behavioral biases, they might over or underinvest. Malmendier and Tate (2005) unearth some favorable evidence of CEO

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[21] If no imperfection of any sort plagues the market, we would be back to the Modigliani-Miller world, where the distribution between household and business saving would be irrelevant, as would be the very existence of a financial system.

[22] Also, as argued earlier, the fact that co-financing conveys a positive signal to outside investors and mitigates moral hazard implies some degree of complementarity, as opposed to substitution, between business saving and outside financing. The argument extends to foreign saving: Aghion, Comin and Howitt (2006) present a model where the complementarity arises as local entrepreneurs put equity in collaboration with foreign investors, thereby reducing agency problems and promoting investment.

[23] This holds true for all kinds of firms. For firms completely excluded from the credit market, such as informal enterprises, r_e can be thought to be infinite.

[24] Once again, $r_i = r_e$ represents a Modigliani-Miller world, a clearly unrealistic condition and one where the mix between internal and intermediated saving is absolutely inconsequential for the economy.

overconfidence leading to overinvestment in the United States. Invoking a rational behavior in the presence of agency problems, Jensen (1986) advances the hypothesis that powerful CEOs with abundant free cash flows are also likely to overinvest to reap personal benefits at the expense of unprotected shareholders (see Cai, 2013, for evidence on a positive link between free cash flows and overinvestment in China). Against this argument, a twofold reply can be offered. For one, inefficient investment is more likely an anomaly rather than a systematic behavior across firms. Secondly, even if more relevant than that at the aggregate level, it must be ensured that banks really are best at allocating loanable funds. In this regard, it remains to be seen if banks excel at this task, as claimed by the finance and growth literature. In the face of steep learning costs about new sectors and firms, risk aversion and regulatory constraints, banks are likely to focus on known and solvent clients and to reduce credit in bad times, in many cases irrespective of the profitability and risk of other projects searching for funds. In the same vein, *lazy banks* may prefer to deal with agency problems by substituting collateral for borrower screening (see Manove, Padilla and Pagano, 2001). Granular data evidence so far is scarce (see, however, Bebczuk and Sangiacomo, 2008, with sectoral data for Argentina).[25]

3. Data

This section is devoted to the presentation and analysis of the database on gross saving and investment by institutional sector. As mentioned in the Introduction, one of the reasons why business saving is under-investigated is the relative scarcity of data when compared to national and even private sector figures. The primary source for building business accounts is, of course, the individual accounting statements of firms.[26] Even though registered firms have the legal obligation to produce financial statements, many countries have not yet set up specialized agencies to centralize, process and validate such information.[27,28]

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[25] The misallocation of bank credit to insolvent firms in Japan since the 1990s has also been a recurrent subject. See for instance Caballero, Hoshi and Kashyap (2008).

[26] Although non-financial businesses should a priori comprise both corporations and unincorporated units—the difference being whether business and household activities are legally separated—in practice most countries only survey corporations, due to the fact that they publish a complete set of accounts, which is not an obligation for unincorporated businesses.

[27] It is true that informal units, which abound in Latin America and other developing and emerging regions, would still be outside the scope of this statistical effort. However, informal establishments are typically small, and hence their exclusion should not greatly distort the macro-level conclusions. Moreover, as also occurs in advanced economies, small businesses are frequently unincorporated and for that reason are recorded under the household sector.

Our paper aims to fill this gap by assembling a broad international dataset, paying special attention to Latin American countries. By combining data from international and national sources, the unbalanced panel covers 64 countries with annual data spanning the 1990-2012 period.[29] Annex 1 list all countries in the sample. The main international source is United Nations National Accounts, and to a lesser extent OECD National Accounts. Additionally, for Latin America and some other economies, data were drawn from the respective Central Bank or national statistics agency. This is, to the best of our knowledge, the largest database to date on gross saving and investment by institutional sector.[30]

Table 1 shows that this country sample with institutional sector data covers just 30 percent of the 215 countries in the world—clearly a small number considering that most of these countries produce official saving and investment statistics at the national, private and public level. The Europe and Central Asia region displays the highest country representation (65 percent) and the Sub-Saharan Africa region the lowest (10 percent). For Latin America and the Caribbean, eight countries (just 19 percent of the total) present data, namely Bolivia (1999-2008), Brazil (1995-2011), Chile (1996-2011), Colombia (1994-2011), Ecuador (2007-2009), Guatemala (2001-2011), Honduras (2000-2010) and Mexico (1993-2011).

Table 2A summarizes gross saving data for the whole sample and for income groups.[31] The average saving rate to GDP is 23.3 percent, with ample differences across groups, from 12.8 percent in low income countries to 32.8 percent in upper middle countries. For the whole sample, business saving amounts to 52.2 percent of national saving, standing out as the main source of saving. Household saving is 41.4 percent of the total and government saving is 6.4 percent. The share of business saving is quite stable across income groups, ranging from 46.8 percent in upper middle income economies to 56.8 percent in the richest countries. Table 2B does similar splitting for the gross investment rate. For the sample as a whole, businesses explain 61.1 percent of total, while households and the government contribute 25.2 percent and 13.7 percent, respectively.

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[28] For Latin American countries lacking institutional sector accounts, an additional effort was made to offer an approximate measure of saving and investment for the non-financial business sector, defining gross saving by non-financial firms as a residual from the identity Gross saving = Gross capital formation + Net lending/borrowing. However, these data will not be used, as results were highly inconsistent, in particular in those cases for which we were able to compare this indirect estimation with national account figures.

[29] Up to the mid-1990s, fewer than 20 countries had data on saving and investment by institutional sector.

[30] Businesses include non-financial and financial firms operating both in the private and the public sector. Saving and investment are treated in gross terms, including the consumption of fixed capital, as a result of the lack of international comparability in the calculation of the latter.

[31] Group figures are PPP GDP-weighted averages.

This percentage goes from 54.2 percent in low income to 69.8 percent in upper middle income countries. It goes without saying that this institutional distribution of saving and investment indicates a drastic departure from the basic textbook model according to which households save but do not invest and businesses invest but do not save.

As a consequence of the relative stability of the previous shares, Table 2A also highlights the observation that higher business saving (investment) is correlated with higher national and private saving (investment). For instance, this fact quickly shows up by comparing low income countries (the ones with the lowest private saving and investment rates) and upper middle income countries (the ones with the highest rates). In low income countries private saving amounts to 12.6 percent of GDP and business saving to 6.1 percent, whereas in the upper middle income economies these numbers are 29.1 percent and 15.3 percent, respectively. Similar differences are seen for investment rates. The private investment rate is 16.8 percent in low income and 28.2 percent in upper middle income countries, while the corresponding figures for business rates are 11.9 percent and 22.2 percent.

Latin American averages appear in Tables 3A and 3B. Compared to the whole sample, Latin America shows lower overall saving and investment rates but a higher proportion of business to national saving (65.4 percent). However, the latter presents a wide dispersion, from lower values in Guatemala (42.9 percent), Chile (45.3 percent) and Ecuador (45.9 percent) to 83 percent in Brazil and 130 percent in Bolivia (where household saving is negative on average).

Focusing on the saving rate and moving from the cross-section to evolution over time, Figure 1 portrays the world (PPP GDP-weighted) average gross saving rate by institutional sector from 1990 to 2010. In this period, business saving to GDP rose to 14.7 percent, up from 9.9 percent, at the time that household saving remained largely stable, dropping slightly from 11.3 percent to 10.6 percent. This means that business saving increased its share of private saving from 47 percent in 1990 to 58 percent in 2010 (with a maximum of 64 percent in 2005). Figure 2 repeats the exercise for OECD countries, showing a similar trend in business saving (from 10.4 percent in 1990 to 13.9 percent in 2010) but a declining path in household saving (from 12 percent to 7.6 percent). For Latin America over 1996-2011, as shown in Figure 3, business saving once again went up (from 11.6 percent to 14 percent) and household saving stayed about constant (5.4 percent and 5.8 percent in 1996 and 2011, respectively). The ratio of business to private saving rose from 68 percent to 71 percent during this period.

With a view to our econometric work in Section 4 on the effect of business saving on private investment and saving, a quick test on the corporate veil offset is the simple correlation between household and business saving at the national level. If the corporate veil holds to some degree, that correlation should a priori be negative. In our dataset, this coefficient is negative in 44 out of the 64 countries for the entire 1990-2012 period, and in 47 countries in 2000-2012. Concerning the link between business saving and investment, we will work only with non-financial firms, because of the peculiar nature of financial firms, both from the assets side (their investment does not have a direct impact on the productive stock of capital) and especially from the liabilities side (being financial intermediaries, they have much higher leverage ratios than other firms). For the whole sample in 2010, non-financial firms explain 97 percent of gross business investment and 87 percent of gross business saving. A raw indicator of the high sensitivity of investment to own funding is that the median saving to investment ratio for non-financial firms in 2010 is 99.5 percent.

4. Econometric Evidence

4.1 Testing the Corporate Veil Hypothesis

In this section we put to the test the corporate veil hypothesis, which states that every change in the business saving is compensated by a change in the opposite direction in the household saving. Although in a frictionless setup this offset is complete, the introduction of an array of market imperfections may attenuate such compensation. To proceed, we estimate a reduced-form private saving equation, defined as private saving (household + business) to gross domestic product. In order to deal with potential endogeneity biases, a Generalized Method of Moments (GMM) system framework is adopted to estimate our panel data model.[32]

Specifically, we want to estimate the following equation:

$$ps_{i,t} = \alpha ps_{i,t-1} + \beta bs_{i,t} + \gamma Z_{i,t} + \mu_t + n_i + \varepsilon_{i,t} \quad (1)$$

where $ps_{i,t}$ is the ratio of private saving to output (i.e., the private saving rate); $bs_{i,t}$ is the business saving rate, $Z_{i,t}$ is a set of control variables, μ_t is a time-specific effect; n_i is a country-specific time-invariant effect; and $\varepsilon_{i,t}$ is the idiosyncratic error term.

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[32] We apply the System GMM estimator developed in Arellano and Bond (1991), Arellano and Bover (1995) and Blundell and Bond (1998). This estimator allows us to address the joint endogeneity of all explanatory variables in a dynamic formulation, and explicitly controls for potential biases arising from country specific effects.

The System GMM approach uses a first-difference transformation of (1) to eliminate the unobserved country-specific effect n_i, and internal lagged level instruments to replace the endogenous variables in the transformed difference equation. These lagged instruments are valid under the assumption that the independent variables are weakly exogenous. This means that they may be correlated with present and past error terms but not with future errors. The problem with this approach is that lagged variables are weak instruments in the presence of serial correlation. This is particularly problematic in the case of saving rates which typically show a great deal of persistence. In order to address this problem, system GMM additionally estimates the level equation using lagged differences as instruments for the contemporaneous level explanatory variables. The inclusion of two equations, one in differences and another one in levels, gives the "System" GMM estimator its name. Note that all regressions include time fixed effects μ_t to control for period-specific events that may affect several countries at the same time.[33]

The main coefficient of interest is β. If households perfectly pierce the corporate veil, changes in business saving do not affect private saving as a whole, yielding a zero coefficient. Otherwise, in the face of a partial piercing, the business saving coefficient is expected to be positive but lower than one in magnitude, meaning that a $1 increase (decrease) in business saving gives way to a decrease (increase) of less than $1 in household saving.

Building on previous contributions (see for example Loayza, Schmidt-Hebbel and Servén, 2000), in addition to business saving, our regressions contain a number of controls usually incorporated into saving equations to account for income, fiscal, demographic and financial factors influencing such decisions.

As can be seen in Tables 3.1 and 3.2, different specifications were run to make sure that our results are sufficiently robust.[34] We start in Table 3.1, column 1, with a standard private saving equation without business saving among its regressors. Then we add our variable of interest in column 2. Next, to capture possible Latin America region-specific effects, we include a dummy for Latin American countries in our sample, as well as the interaction between such dummy variable and business saving, without encountering any significant effect. Year fixed

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[33] Also, the methodology employed assumes no correlation across countries in the idiosyncratic disturbances. Time dummies make this assumption more likely to hold (see Roodman, 2006)

[34] Furthermore, it is important to point out that both diagnostic statistics tests—for serial correlation and the validity of the instruments (i.e., the AR2 test and the Hansen-J test)—provide support for the chosen specification. In particular, they show that there are no traces of second-order autocorrelation and that the over-identifying restrictions are not rejected at conventional levels of confidence.

effects, included in previous estimations, are likewise dropped in column 4 without noteworthy changes in overall results. The last column, in turn, eliminates the real interest rate from our control set. Since reliable information on the deposit interest rate is not available for the whole country sample, this greatly expands our sample from 54 to 61 economies. However, this does not cause any remarkable modification in statistical or economic significance.[35]

Subsequently, Table 3.2 shows some OLS results. Although this technique may not be free from endogeneity bias, we opted to include them to test if our baseline results hold within the more straightforward and transparent context of a basic OLS regression. Our business saving-expanded saving regressions differ in the kind of fixed effects included: Column 2 has two-way effects (country and time), column 3 only time, and column 4 only country.

Regarding our control set, we follow previous work to include the level and growth rate of real GDP, the terms of trade, the real interest rate, the degree of financial deepening (as measured by the M2/GDP ratio), the flow of private credit, the government saving rate, the urbanization rate, the old and young dependency ratios, and the rate of inflation. While most but not all of these variables display the expected sign, they typically happen to be fragile, in the sense that they are not consistently significant across the various regressions reported in Tables 3.1 and 3.2. Unlike most controls, the lagged private saving rate is invariably significant, hinting at a strong inertial behavior in the series. Similarly, the government saving rate presents for the most part the negative and lower than one coefficient found in many saving studies, confirming the empirical conclusion about a partial fulfillment of Ricardian Equivalence. Our GMM estimate hovers around -0.25, which is lower than other estimates in the literature.[36]

Reassuringly, though, our main variable of interest yields quite robust results. The coefficient is not only highly significant but reasonably stable across different specifications. With a value ranging between 0.58 and 0.72 in our GMM regressions in Table 3.1, there appears to be clear evidence of a partial piercing of the corporate veil. For our core estimation (0.72 in column 1), this implies that a $1 increase (decrease) in business saving gives rise to a decrease (increase) of just $0.28 in household saving. OLS regressions in Table 3.2 deliver equally

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[35] Table 3.1 also presents the Hansen over-identification test, where the null hypothesis is that the instrumental variables (internal instruments) are uncorrelated with the residuals (also known as the exclusion restrictions), and the second order serial correlation test, where the null hypothesis is that the errors in the differenced equation exhibit no second order correlation.

[36] Estimates vary across studies, but they tend to cluster in the range of -0.4 to -0.6, suggesting that for every dollar by which public saving is increased, private saving tends to fall by 40 to 60 cents. See, for example, Röhn (2010).

significant results, which only weaken in size when country effects are dropped in column 3, but without threatening statistical significance.

To complete our econometric analysis, Table 3.3 features a GMM estimation of the household saving rate rather than the private saving rate, while keeping the same control set. This change intends to address two foreseeable criticisms to previous regressions, namely i) that since business saving is on both the left and the right-hand sides, this may be driving its positive loading; and ii) strictly speaking, the theoretical arguments—and their empirical counterparts— explaining saving behavior apply to households and not necessarily to business, so the proper dependent variable should be household and not private saving. For instance, the permanent income framework and its extensions over time were devised with consumers in mind—not firms, whose study pertains to the corporate finance field. The results strongly reinforce earlier findings. In particular, business saving shows the expected negative sign with high statistical significance. Moreover, the quantitative short-run effect is reasonably consistent with that emerging from private saving regressions: the implicit offset coefficient derived from the private saving regression (-0.28, as a result of an estimate of 0.72 in column 2, Table 3.1) is roughly similar to the -0.22 obtained from a direct regression of household saving on business saving in column 2, Table 3.3.[37]

Unfortunately, the lack of data on unincorporated firms prevents this relationship from being tested for informal enterprises. Other than that, however, the omission of these firms should not distort much our statistical and econometric evidence: for one, small firms are expected to have a small weight in aggregate flows of saving and investment; secondly, the study of the corporate veil actually requires households and businesses to be legally separated entities—this is precisely the meaning of the "veil."

4.2 Corporate Investment and Saving

We now turn our attention to the link between business saving and business investment. To do so, we will perform standard investment regressions (see, for instance, Servén, 2003, and Cavallo and Daude, 2011) augmented with business saving as a novel regressor and using business investment as the dependent variable instead of private investment, as is customary in the literature.

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[37] Unreported OLS estimates are also similar to those just described.

The baseline specification is the following:

$$bi_{i,t} = \alpha bi_{i,t-1} + \beta bs_{i,t} + \gamma Z_{i,t} + \mu_t + n_i + \varepsilon_{i,t} \quad (2)$$

where $bi_{i,t}$ is the ratio of business investment to output; $bs_{i,t}$ is the business saving to output, $Z_{i,t}$ is a set of control variables, μ_t is a time-specific effect; n_i is a country-specific time-invariant effect; and $\varepsilon_{i,t}$ is the idiosyncratic error term.

Our core regression includes two explanatory variables: the per capita GDP growth rate and the business saving rate. This specification resembles the structure of financial constraints tests in the tradition of Fazzari, Hubbard and Petersen (1988), where investment activity is assumed to solely depend on two factors: expected profitability, proxied by Tobin's q, and the availability of internal cash flow. At the macro level, it is not simple to come up with a sound measure of expected profitability, but observed GDP growth is certainly taken as a signal by the business community. Servén and Solimano (1993) claim that changes in output are by far the main empirical explanation of investment changes in developing countries. This is somewhat puzzling in view of the allegedly forward-looking nature of investment activity and the less-than-persistent trajectory of GDP growth rates. Nevertheless, myopic behavior or the lack of other reliable sources of information for forecasting future profitability determine that private investment are prone to be highly sensitive to past or contemporaneous output growth. The second regressor is similar to the one employed in the financial constraints tests, with the difference that cash flow measures available internal funding before dividends and business saving is computed after dividend payout. A positive loading on business saving would hint at the presence of financial constraints, whereby firms require internal funding to pursue their investment plans—external financing is either more expensive than their own saving or downright non-existent.

As additional controls, we include i) the lagged dependent variable, to capture inertia; ii) the volatility of GDP growth (measured by its standard deviation in the previous three years), as a proxy for macroeconomic uncertainty; iii) the flow of private credit to GDP (the same variable included in saving regressions), to check whether changes in credit stimulate investment;[38] and iv) government investment, so as to put the crowding-out hypothesis to the test. Year dummies (in GMM estimations) and year and country dummies (in OLS exercises) complete the set of

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[38] Properly measured, the credit variable should only comprise commercial credit. However, such variable is not available for our broad set of countries and years.

controls. After dropping those countries with less than five yearly observations, our sample ends up with 55 countries.

Table 3.4 presents the baseline GMM results (following the same methodology described in the preceding section). Although the only valid, full specification appears in the last column, we opted to introduce sequentially the two main explanatory variables to call attention to the fact, frequently raised in the financial constraints literature, that expected profitability and available cash flows may be correlated (see Hubbard, 1998). In the present case, GDP growth boosts business sales and profits and hence, for a given dividend policy, brings about larger saving. This may explain the drop in the business saving coefficient after adding GDP growth on the right-hand side. The estimate, while significant at 1 percent in all three regressions, falls from 0.161 in column (1)—without additional controls other than the lagged business investment and the year dummy—to 0.126 with the inclusion of GDP growth. With the full control set, the value slightly declines to 0.116. These figures suggest that a one-percent of GDP reduction in business saving causes a business investment contraction of about 0.12 percent of GDP. By the way, the results confirm that GDP growth is a major driver of business investment decisions: if per capita growth goes down by 1 percentage point, the business investment rate goes down by 0.3 percentage points of GDP. The other controls, with the exception of the autocorrelation term, turn out to be non-significant.

Some robustness checks are discussed next. Most of the previous literature in the field is based on national or, in the best case, private investment data. This choice, when not imposed by data limitations, may be misleading in that household and government investment are not necessarily guided by the same profit maximization considerations underlying business decisions. Anyway, to make our results comparable to previous studies, results for private investment are shown in Table 3.5, where the positive and significant saving effect is found once again, although the value is much lower (0.046). Another change in the left-hand side is explored in Table 3.6 by isolating the non-financial business sector to exclude banks and other financial firms, whose behavior may differ from that of companies operating on the real side of the economy. For this subset, the coefficient rises to 0.16. OLS estimations are shown, despite the bias created by the coexistence of fixed effects and the lagged dependent variable, in Tables 3.7 to 3.9. The saving variable remains significant at 10 percent for the whole business sector and at 1 percent for the private sector, but loses significance for non-financial businesses. In unreported

regressions, the value and significance of these estimates marginally improve when the first lag of the additional controls are entered in the regression.

A final robustness check is displayed in Table 3.10. It can be argued that saving should become a limiting factor for investment only if the latter exceeds the former. Otherwise, changes in saving may not necessarily induce changes in investment. Saving and investment are driven by different factors (in short, past revenues and dividends in the former case and expected profitability in the latter), and thus they can take quite different values for any particular economic unit. Therefore, the theoretical correlation between them is not necessarily positive, even in a world characterized by financial frictions. As explained earlier in the text, it is true that, faced with a good investment opportunity, a business will likely prefer to use its own saving as its first financing choice. But this is not the same as saying that an increase in business saving will generate an increase in business investment. When business saving increases (because of, say, bigger sales and earnings), the firm will use it for either physical investment (our dependent variable) or other investments (cash and securities, inventories). A firm displaying low physical investment levels relative to its saving availability can be reasonably assumed to have scarce investment opportunities at hand, in which case an exogenous saving increase is less likely to be channeled towards physical investment and more likely to be used to accumulate financial or other assets. A genuine financial constraint arises, on the contrary, when the firm expects high future returns, and consequently invests as much as possible, to the point that its own saving becomes a binding constraint on accepting all profitable projects. Since the manager continues to prefer internal to external financing, additional saving is more likely to be used to buy new (or to replace depreciated) physical capital. For these businesses, investment is likely to be more sensitive to saving than for others.

To test this hypothesis, we construct a dummy variable taking value 1 if, for each particular year and sector (businesses, non-financial businesses and the private sector as a whole), investment is greater than or equal to saving.[39] This binary variable is then interacted with sectoral saving. If the argument is valid, this interaction should yield a positive and significant coefficient, after including the three constitutive terms (saving, the new dummy

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[39] In our database, business investment is equal or above business saving in 64 percent of total country-year observations. For the private and non-financial business sectors, this figure is 48 percent and 72 percent, respectively.

variable and the interaction between them).[40] The business sector GMM regression lends support to this claim, as the interaction delivers a positive and significant coefficient, for a total effect of business saving of 0.355. However, the interaction term fails to be significant for the private and the non-financial business sectors. Despite this, compared to previous results, the saving coefficient rises in both cases (from 0.046 in Table 3.5 to 0.126 for the private sector and, in a less pronounced fashion, from 0.16 in Table 3.6 to 0.177, for the non-financial business sector).

5. Conclusions and Policy Implications

Our paper has investigated the relevance of business saving for private saving and investment around the world by constructing and exploiting a broad international, unbalanced panel of 64 countries over 1990-2012. To lay the foundations of such empirical work, we first reviewed the literature on the subject, contrasting the treatment of business saving in the macroeconomic field —which for the most part views business saving as a poor substitute for external finance—and the corporate finance field—according to which internal funding represents an optimal choice.

On the statistical front, our first finding is that, contrary to the standard textbook model, businesses are the principal contributors to private and national saving. For the whole sample, the share of business to private saving has gone up from 47 percent in 1990 to 58 percent in 2010. Also, upon casual inspection of the data, the higher the business saving rate, the higher the private saving and investment rates. From a theoretical standpoint, this link can be rationalized by invoking financial frictions and departures from the corporate veil hypothesis. To test these theories we have run private saving and private investment regressions on our panel. In brief, our results indicate that a $1 increase in business saving raises private saving by $0.72 and private investment by $0.12.

A major policy implication is that measures in favor of a greater volume of business saving should be welcome. Tax policy is a prime candidate for this task. The usual stand is that the way to go is to encourage household saving while, to the extent possible, preserving fiscal neutrality by raising corporate taxes. This conception is probably rooted in the mistaken prior that it is the household sector the preponderant source of saving in the economy. In the words of James Poterba (1987: 455), *"Although corporations are responsible for roughly half of private saving in the United States, most studies of saving focus exclusively on household behavior.*

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[40] See Brambor, Clark and Golder (2006) about the econometric justification to include all three terms.

Policy initiatives to increase saving have also concentrated on personal saving (…)" This diagnosis has not changed much indeed since then. Both soft and hard evidence is astoundingly scarce, but it hints at a positive impact of a more lenient tax treatment on the earnings of formal businesses—obviously, informal businesses would not benefit from such tax reform. In this regard, Vergara (2004) offers macro and micro evidence for Chile that the lowering of the tax rate on retained earnings from 50 percent to 10 percent over the 1980s was a significant factor in boosting private investment in subsequent years. In turn, PwC (2013) surveys the corporate income tax rate in 111 countries in 2012, concluding that the average statutory rate is 24.2 percent (within a 15-30 percent range) and the actual rate paid, after some accounting adjustments, is 23.4 percent. Interestingly enough, 51 percent of the countries have lowered the statutory rate between 2006 and 2012. This latter fact may suggest that authorities may be becoming more aware of the positive effects of lower taxes on business as a catalyst of greater saving and investment rates.

A final word of caution is that these recommendations do not contradict at all the conventional advice about nurturing the financial intermediation process. Business and personal saving both play a positive role on long-term growth. It is evident that, unlike personal saving, business saving, when reinvested in the firm, remains outside the financial system, but this does not entail a problem. In fact, these resources, largely immune to transaction and informational costs, should be used to the extent possible. But at the point where they are exhausted, banks and markets should be tapped to take advantage of all remaining profitable investment opportunities.

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Table 1. Number of Countries in the Sample, by Region and Income Level

Country Group	Number of countries	% of countries in the group
World	64	29.8
By region		
East Asia & Pacific	5	13.5
Europe & Central Asia	37	64.9
Latin America & Caribbean	8	19.5
Middle East & North Africa	6	28.6
North America	2	66.7
South Asia	1	12.5
Sub-Saharan Africa	5	10.4
By income level		
Low	4	11.1
Lower middle	10	20.8
Upper middle	14	25.5
High	36	47.4

Table 2A. Gross National Saving: Institutional Breakdown, Whole Sample

Country Group	Gross National Saving	Household	Business	Government
	In % of GDP	In % of gross national saving		
World	23.3%	41.4%	52.2%	6.4%
By income level				
Low	12.8%	51.1%	47.2%	1.7%
Lower middle	22.6%	43.2%	52.3%	4.5%
Upper middle	32.8%	42.0%	46.8%	11.2%
High	21.1%	40.8%	56.8%	2.4%

Table 2B. Gross National Investment: Institutional Breakdown, Whole Sample

Country Group	Gross National Investment	Household	Business	Government
	In % of GDP	In % of gross national investment		
World	23.4%	25.2%	61.1%	13.7%
By income level				
Low	22.0%	22.1%	54.2%	23.8%
Lower middle	22.9%	22.2%	61.0%	16.7%
Upper middle	31.8%	18.8%	69.8%	11.5%
High	21.5%	27.5%	57.4%	15.0%

Table 3A. Gross National Saving: Institutional Breakdown, Latin America

Country Group	Gross National Saving	Household	Business	Government
	In % of GDP	In % of gross national saving		
Latin America	18.5%	33.8%	65.4%	0.8%
By income level				
Bolivia	16.2%	-31.0%	130.1%	0.8%
Brazil	16.4%	33.6%	82.9%	-16.5%
Chile	21.9%	32.2%	45.3%	22.5%
Colombia	17.5%	35.8%	59.3%	4.9%
Ecuador	27.5%	24.1%	45.9%	30.0%
Guatemala	13.7%	40.0%	42.9%	17.1%
Honduras	21.4%	20.8%	69.4%	9.8%
Mexico	21.0%	34.6%	54.5%	10.9%

Table 3B. Gross National Investment: Institutional Breakdown, Latin America

Country Group	Gross National Investment	Household	Business	Government
	In % of GDP	In % of gross national investment		
Latin America	20.3%	22.1%	64.9%	13.0%
By income level				
Bolivia	15.0%	7.2%	59.7%	33.1%
Brazil	18.4%	25.8%	62.6%	11.6%
Chile	22.3%	23.0%	66.7%	10.3%
Colombia	19.5%	22.5%	62.3%	15.2%
Ecuador	24.9%	19.7%	55.9%	24.4%
Guatemala	18.3%	25.3%	57.4%	17.3%
Honduras	27.4%	8.9%	79.1%	12.0%
Mexico	22.6%	18.6%	68.2%	13.3%

Figure 1. Gross National Saving: Institutional Breakdown, Whole Sample, Annual Data for 1990-2010
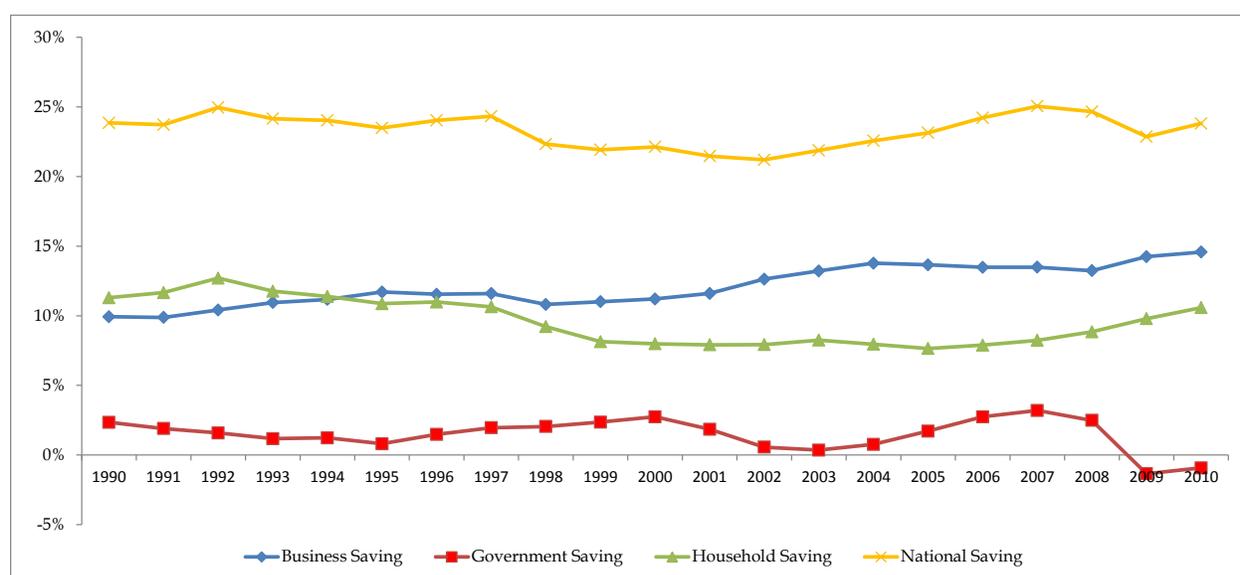
**Figure 2. Gross National Saving: Institutional Breakdown, OECD Countries,
Annual Data for 1990-2010**
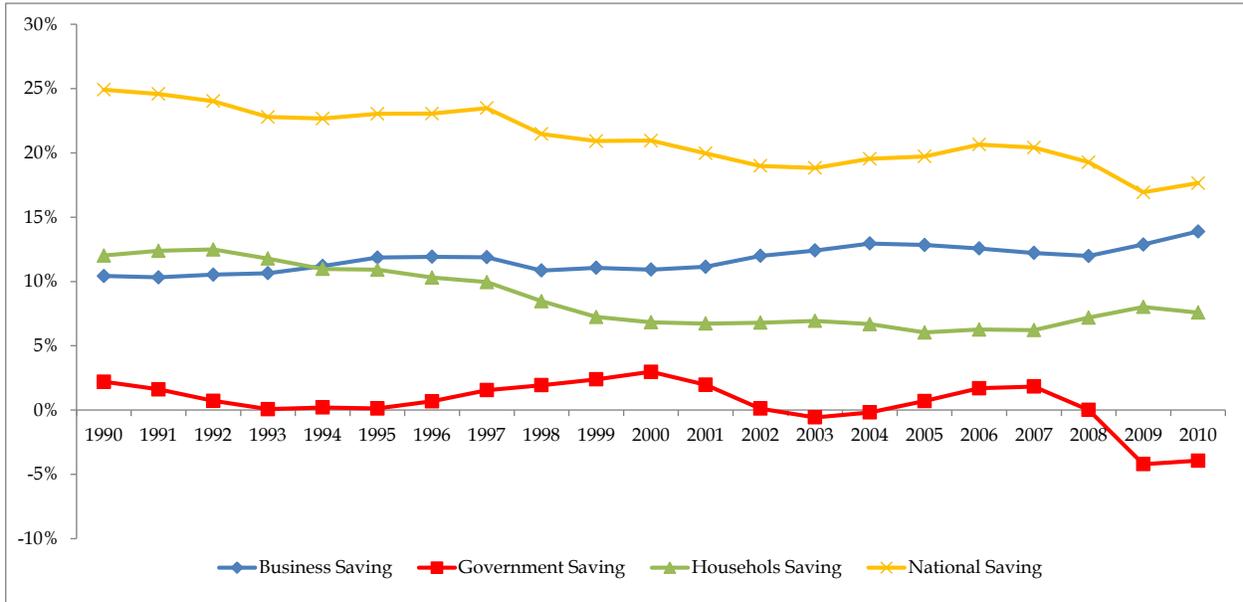
**Figure 3.Gross National Saving: Institutional Breakdown, Latin American Countries,
Annual Data for 1996-2011**
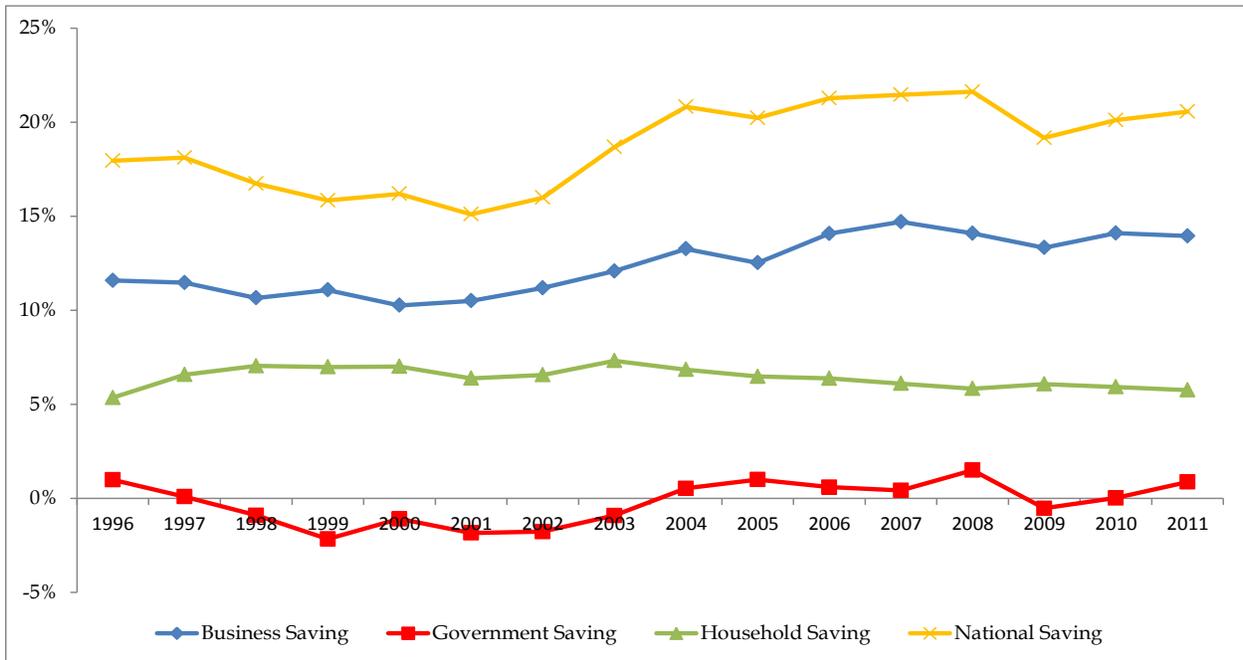
Table 3.1. Private Saving Rate Regressions

Variables	(1)	(2)	(3)	(4)	(5)
Private Saving Rate (-1)	0.572***	0.301***	0.342***	0.390***	0.298***
	(0.058)	(0.045)	(0.055)	(0.032)	(0.045)
Business Saving Rate		0.722***	0.680***	0.581***	0.654***
		(0.131)	(0.168)	(0.062)	(0.051)
Log Real GDP	0.007	0.025***	0.027***	0.013***	0.013***
	(0.006)	(0.007)	(0.008)	(0.003)	(0.003)
GDP growth	0.203*	0.029	-0.007	0.050	0.050
	(0.102)	(0.063)	(0.090)	(0.042)	(0.058)
Real Interest Rate (log)	0.126**	0.051	0.043	0.105***	
	(0.062)	(0.053)	(0.055)	(0.038)	
M2/GDP	-0.002	0.021	0.025*	0.011	0.020***
	(0.010)	(0.013)	(0.014)	(0.008)	(0.007)
Terms of Trade (Log)	0.102**	0.052	0.053	0.026	0.052**
	(0.041)	(0.033)	(0.047)	(0.016)	(0.024)
Urbanization Rate	-0.035	-0.224***	-0.289***	-0.073*	-0.107***
	(0.055)	(0.061)	(0.096)	(0.037)	(0.037)
Old Dependency Ratio	-0.109	-0.105	0.006	-0.109	-0.036
	(0.107)	(0.116)	(0.146)	(0.086)	(0.095)
Young Dependency Ratio	-0.098**	-0.134**	-0.163**	-0.071*	-0.054*
	(0.048)	(0.050)	(0.065)	(0.037)	(0.031)
Inflation Rate (Log)	-0.013	-0.017	-0.027**	-0.003	-0.009
	(0.026)	(0.012)	(0.014)	(0.012)	(0.008)
Government Saving Rate	-0.287***	-0.246*	-0.157	-0.276***	-0.233***
	(0.097)	(0.128)	(0.160)	(0.043)	(0.048)
Private Credit Flow	-0.019	0.001	-0.001	-0.018**	0.002
	(0.013)	(0.010)	(0.011)	(0.007)	(0.007)
Dummy Latin America			0.004		
			(0.044)		
Business Saving*LA			0.312		
			(0.351)		
Constant	-0.388*	-0.274	-0.455	-0.122	-0.261**
	(0.216)	(0.165)	(0.302)	(0.092)	(0.114)
Method	GMM Sys	GMM Sys	GMM Sys	GMM Sys	GMM Sys
Year fixed effect	Yes	Yes	Yes	No	Yes
Observations	654	654	654	654	867
Number of countries	54	54	54	54	61
AR(1)	0.024	0.015	0.028	0.034	0.029
AR(2)	0.536	0.243	0.407	0.942	0.272
Hansen Test	0.856	0.623	0.809	0.168	0.253

*** Significant at 1%, ** Significant at 5%, * Significant at 10%

Table 3.2. Private Saving Rate Regressions: Robustness Checks I

Variables	(1)	(2)	(3)	(4)
Private Saving Rate (-1)	0.490***	0.368***	0.784***	0.367***
	(0.034)	(0.031)	(0.030)	(0.030)
Business Saving Rate		0.612***	0.249***	0.619***
		(0.044)	(0.042)	(0.043)
Log Real GDP	0.013	0.010	0.001**	0.012
	(0.012)	(0.010)	(0.000)	(0.009)
GDP growth	0.125***	0.027	0.041	0.014
	(0.038)	(0.033)	(0.053)	(0.028)
Real Interest Rate (log)	0.060*	0.061**	0.050	0.051**
	(0.031)	(0.027)	(0.042)	(0.024)
M2/GDP	-0.013	-0.013*	0.008***	-0.009
	(0.008)	(0.007)	(0.003)	(0.006)
Terms of Trade (Log)	0.032***	0.034***	0.010	0.037***
	(0.009)	(0.008)	(0.006)	(0.007)
Urbanization Rate	0.130**	0.149***	-0.026***	0.135**
	(0.064)	(0.055)	(0.010)	(0.053)
Old Dependency Ratio	-0.400***	-0.664***	-0.071**	-0.685***
	(0.079)	(0.071)	(0.031)	(0.064)
Young Dependency Ratio	-0.032	-0.019	-0.026*	-0.046
	(0.059)	(0.051)	(0.014)	(0.046)
Inflation Rate (Log)	0.008	0.020	-0.014	0.016
	(0.015)	(0.013)	(0.016)	(0.012)
Government Saving Rate	-0.480***	-0.394***	-0.109***	-0.397***
	(0.043)	(0.037)	(0.039)	(0.035)
Private Credit Flow	-0.017*	-0.011	-0.019**	-0.012
	(0.009)	(0.009)	(0.009)	(0.007)
Constant	-0.189	0.002	0.002	-0.200*
	(0.148)	(0.039)	(0.039)	(0.115)
Method	OLS	OLS	OLS	OLS
Year fixed effect	Yes	Yes	Yes	No
Country fixed effect	Yes	Yes	No	Yes
Observations	654	654	654	654
Number of countries	54	54	54	54

*** Significant at 1%, ** Significant at 5%, * Significant at 10%

Table 3.3. Household Saving Rate Regressions: Robustness Checks II

Variables	(1)	(2)	(3)	(4)	(5)
Household Saving Rate (-1)	0.579***	0.536***	0.591***	0.576***	0.558***
	(0.077)	(0.070)	(0.085)	(0.027)	(0.048)
Business Saving Rate		-0.223**	-0.374***	-0.210***	-0.297***
		(0.097)	(0.134)	(0.026)	(0.059)
Log Real GDP	0.019***	0.018***	0.012**	0.008***	0.004
	(0.004)	(0.005)	(0.005)	(0.001)	(0.004)
GDP growth	-0.062	0.060	0.202**	0.089***	0.082*
	(0.066)	(0.089)	(0.089)	(0.019)	(0.046)
Real Interest Rate (log)	0.079	0.150*	0.202**	0.147***	
	(0.056)	(0.079)	(0.080)	(0.009)	
M2/GDP	0.010	0.004	0.012	0.017***	0.006
	(0.008)	(0.009)	(0.009)	(0.004)	(0.006)
Terms of Trade (Log)	0.025	0.040*	0.049*	0.046***	0.029
	(0.024)	(0.021)	(0.026)	(0.009)	(0.021)
Urbanization Rate	-0.172***	-0.148***	-0.090	-0.073***	-0.020
	(0.033)	(0.047)	(0.062)	(0.013)	(0.031)
Old Dependency Ratio	-0.002	-0.115*	-0.085	-0.089**	-0.076
	(0.091)	(0.065)	(0.083)	(0.038)	(0.067)
Young Dependency Ratio	-0.098**	-0.140***	-0.108***	-0.085***	-0.050
	(0.040)	(0.038)	(0.039)	(0.017)	(0.033)
Inflation Rate (Log)	-0.011	-0.023	-0.004	0.006**	0.002
	(0.015)	(0.020)	(0.022)	(0.003)	(0.008)
Government Saving Rate	-0.105**	-0.184**	-0.189**	-0.126***	-0.155***
	(0.052)	(0.070)	(0.076)	(0.018)	(0.039)
Private Credit Flow	0.001	0.010	-0.024	-0.013***	0.002
	(0.013)	(0.015)	(0.020)	(0.004)	(0.009)
Dummy Latin America			-0.024		
			(0.075)		
Business Saving*LA			0.150		
			(0.614)		
Constant	-0.160	-0.151	-0.176	-0.167***	-0.081
	(0.125)	(0.103)	(0.132)	(0.049)	(0.107)
Method	GMM Sys	GMM Sys	GMM Sys	GMM Sys	GMM Sys
Year fixed effect	Yes	Yes	Yes	No	Yes
Observations	654	654	654	654	867
Number of countries	54	54	54	54	61
AR(1)	0.008	0.006	0.040	0.014	0.022
AR(2)	0.490	0.685	0.516	0.243	0.397
Hansen Test	0.811	0.386	0.319	0.221	0.108

*** Significant at 1%, ** Significant at 5%, * Significant at 10%

Table 3.4. Business Investment Rate Regressions

Variables	(1)	(2)	(3)
Business Investment Rate (-1)	0.753***	0.556***	0.662***
	(0.103)	(0.082)	(0.050)
Business Saving Rate	0.161***	0.126***	0.116***
	(0.054)	(0.042)	(0.043)
Per Capita GDP Growth		0.297***	0.302***
		(0.082)	(0.041)
Per Capita GDP Growth Volatility			-0.054
			(0.041)
Private Credit Flow			-0.002
			(0.006)
Government Investment Rate			0.097
			(0.146)
Constant	0.006	0.040***	0.034
	(0.016)	(0.013)	(0.030)
Method	GMM Sys	GMM Sys	GMM Sys
Year fixed effect	Yes	Yes	Yes
Observations	952	952	907
Number of countries	55	55	54
AR(1)	0.000	0.000	0.000
AR(2)	0.647	0.587	0.822
Hansen Test	0.152	0.529	0.230

Table 3.5. Private Investment Rate Regressions

Variables	(1)	(2)	(3)
Private Investment Rate (-1)	0.680***	0.740***	0.691***
	(0.101)	(0.061)	(0.052)
Private Saving Rate	0.191***	0.068**	0.046**
	(0.055)	(0.032)	(0.021)
Per Capita GDP Growth		0.315***	0.392***
		(0.084)	(0.050)
Per Capita GDP Growth Volatility			-0.029
			(0.031)
Private Credit Flow			-0.011*
			(0.007)
Government Investment Rate			-0.014
			(0.157)
Constant	0.017	0.033***	0.100***
	(0.016)	(0.012)	(0.035)
Method	GMM Sys	GMM Sys	GMM Sys
Year fixed effect	Yes	Yes	Yes
Observations	946	946	901
Number of countries	55	55	54
AR(1)	0.000	0.005	0.001
AR(2)	0.904	0.570	0.913
Hansen Test	0.289	0.983	0.240

*** Significant at 1%, ** Significant at 5%, * Significant at 10%

Table 3.6. Non-Financial (NF) Business Investment Rate Regressions

Variables	(1)	(2)	(3)
NF Business Investment Rate (-1)	0.567***	0.615***	0.657***
	(0.170)	(0.064)	(0.067)
NF Business Saving Rate	0.311***	0.091	0.160**
	(0.099)	(0.062)	(0.072)
Per Capita GDP Growth		0.314***	0.267***
		(0.079)	(0.041)
Per Capita GDP Growth Volatility			-0.074*
			(0.041)
Private Credit Flow			-0.011
			(0.009)
Government Investment Rate			-0.044
			(0.195)
Constant	0.019	0.033***	0.077*
	(0.020)	(0.012)	(0.042)
Method	GMM Sys	GMM Sys	GMM Sys
Year fixed effect	Yes	Yes	Yes
Observations	896	896	852
Number of countries	52	52	51
AR(1)	0.000	0.009	0.048
AR(2)	0.848	0.538	0.579
Hansen Test	0.878	0.244	0.252

*** Significant at 1%, ** Significant at 5%, * Significant at 10%

Table 3.7. Business Investment Rate Regressions: Robustness Check

Variables	(1)	(2)	(3)
Business Investment Rate (-1)	0.671***	0.665***	0.654***
	(0.025)	(0.023)	(0.025)
Business Saving Rate	0.082***	0.058**	0.041*
	(0.026)	(0.024)	(0.025)
Per Capita GDP Growth		0.247***	0.230***
		(0.020)	(0.021)
Per Capita GDP Growth Volatility			-0.144***
			(0.038)
Private Credit Flow			0.003
			(0.002)
Government Investment Rate			-0.085
			(0.084)
Constant	0.040***	0.041***	0.041***
	(0.011)	(0.010)	(0.012)
Method	OLS	OLS	OLS
Year fixed effect	Yes	Yes	Yes
Country fixed effect	Yes	Yes	Yes
R2	0.541	0.609	0.604
Observations	952	952	907
Number of countries	55	55	54

*** Significant at 1%, ** Significant at 5%, * Significant at 10%

Table 3.8. Private Investment Rate Regressions: Robustness Check

Variables	(1)	(2)	(3)
Private Investment Rate (-1)	0.710***	0.723***	0.721***
	(0.024)	(0.021)	(0.023)
Private Saving Rate	0.097***	0.051***	0.056***
	(0.020)	(0.018)	(0.019)
Per Capita GDP Growth		0.332***	0.321***
		(0.021)	(0.022)
Per Capita GDP Growth Volatility			-0.103**
			(0.041)
Private Credit Flow			0.002
			(0.002)
Government Investment Rate			-0.071
			(0.090)
Constant	0.046***	0.048***	0.046***
	(0.012)	(0.011)	(0.012)
Method	OLS	OLS	OLS
Year fixed effect	Yes	Yes	Yes
Country fixed effect	Yes	Yes	Yes
R2	0.624	0.708	0.706
Observations	946	946	901
Number of countries	55	55	54

*** Significant at 1%, ** Significant at 5%, * Significant at 10%

Table 3.9. Non-financial (NF) Business Investment Rate Regressions: Robustness Check

Variables	(1)	(2)	(3)
NF Business Investment Rate (-1)	0.669***	0.662***	0.651***
	(0.026)	(0.024)	(0.026)
NF Business Saving Rate	0.086***	0.055**	0.036
	(0.028)	(0.026)	(0.027)
Per Capita GDP Growth		0.239***	0.224***
		(0.021)	(0.021)
Per Capita GDP Growth Volatility			-0.144***
			(0.039)
Private Credit Flow			0.003
			(0.002)
Government Investment Rate			-0.077
			(0.090)
Constant	0.040***	0.042***	0.041***
	(0.012)	(0.011)	(0.013)
Method	OLS	OLS	OLS
Year fixed effect	Yes	Yes	Yes
Country fixed effect	Yes	Yes	Yes
R2	0.545	0.610	0.606
Observations	896	896	852
Number of countries	52	52	51

*** Significant at 1%, ** Significant at 5%, * Significant at 10%

Table 3.10. Investment Rate Regressions and Binding Financial Constraints

Variables	Business Sector	Private Sector	Non-financial business sector
Investment Rate (-1)	0.557***	0.593***	0.544***
	(0.035)	(0.035)	(0.047)
Saving Rate	0.121***	0.126***	0.177**
	(0.045)	(0.041)	(0.075)
Saving Rate × Dummy [(Inv ≥ Sav)=1]	0.234***	0.054	0.044
	(0.046)	(0.048)	(0.070)
Dummy [(Inv ≥ Sav)=1]	-0.014**	0.009	0.008
	(0.007)	(0.009)	(0.009)
Per Capita GDP Growth	0.262***	0.397***	0.282***
	(0.037)	(0.046)	(0.047)
Per Capita GDP Growth Volatility	-0.091**	-0.045	0.198
	(0.040)	(0.029)	(0.128)
Private Credit Flow	-0.005	-0.002	-0.024***
	(0.004)	(0.003)	(0.007)
Government Investment Rate	0.039	0.124	-0.257
	(0.106)	(0.148)	(0.228)
Constant	0.056***	0.052***	0.143***
	(0.020)	(0.019)	(0.036)
Method	GMM Sys	GMM Sys	GMM Sys
Year fixed effect	Yes	Yes	Yes
Observations	907	901	852
Number of countries	54	54	51
AR(1)	0.000	0.000	0.000
AR(2)	0.780	0.392	0.287
Hansen Test	0.164	0.293	0.566

Annex: List of Countries in the Database, Ordered by Region

Table A.1.

Country	Region	Income level	Source and period
Australia	East Asia & Pacific	High income	Australian Bureau of Statistics (1960-2012)
China	East Asia & Pacific	Upper middle income	United Nations (1992-2012)
New Zealand	East Asia & Pacific	High income	UN (1986-1998); Statistics New Zealand (1999-2009)
Japan	East Asia & Pacific	High income	United Nations (1980-2010); OECD (2011)
Korea, Republic of	East Asia & Pacific	High income	United Nations (1975-2011)
Armenia	Europe & Central Asia	Lower middle income	United Nations (1994-2009)
Azerbaijan	Europe & Central Asia	Upper middle income	United Nations (2000-2010)
Belgium	Europe & Central Asia	High income	United Nations (1985-2010); OECD (2011)
Bulgaria	Europe & Central Asia	Upper middle income	United Nations (1998-2010)
Hungary	Europe & Central Asia	Upper middle income	United Nations (1995-2010); OECD (2011)
Kazakhstan	Europe & Central Asia	Upper middle income	United Nations (2000-2010)
Kyrgyz Republic	Europe & Central Asia	Low income	United Nations (1995-2010)
Moldova	Europe & Central Asia	Lower middle income	United Nations (2008-2010)
Romania	Europe & Central Asia	Upper middle income	United Nations (1995-2009)
Serbia	Europe & Central Asia	Upper middle income	United Nations (2001-2010)
Ukraine	Europe & Central Asia	Lower middle income	United Nations (1993-2010)

Table A.1., continued

Country	Region	Income level	Source and period
Austria	Europe & Central Asia	High income	United Nations (1995-2010); OECD (2011)
Croatia	Europe & Central Asia	High income	United Nations (1997-2007)
Cyprus	Europe & Central Asia	High income	United Nations (1995-2010)
Czech Republic	Europe & Central Asia	High income	United Nations (1995-2010); OECD (2011)
Denmark	Europe & Central Asia	High income	United Nations (1982-1994); OECD (1995-2011)
Estonia	Europe & Central Asia	High income	United Nations (2000-2010); OECD (2011)
Finland	Europe & Central Asia	High income	United Nations (1998-2010); OECD (2010-2011)
France	Europe & Central Asia	High income	United Nations (1960-2010); OECD (2011-2012)
Germany	Europe & Central Asia	High income	United Nations (1981-2010); OECD (2011)
Greece	Europe & Central Asia	High income	United Nations (1995-2010)
Ireland	Europe & Central Asia	High income	United Nations (2002-2010); OECD (2011)
Italy	Europe & Central Asia	High income	United Nations (1980-2010); OECD (2011-2012)
Latvia	Europe & Central Asia	High income	United Nations (1994-2010)
Lithuania	Europe & Central Asia	High income	United Nations (1995-2010)
Luxembourg	Europe & Central Asia	High income	United Nations (2006-2008)
Netherlands	Europe & Central Asia	High income	United Nations (1980-2011); OECD (2012)
Norway	Europe & Central Asia	High income	United Nations (1978-2011)
Poland	Europe & Central Asia	High income	United Nations (1995-2010); OECD (2011)
Portugal	Europe & Central Asia	High income	United Nations (1995-2011); OECD (2012)

Table A.1., continued

Country	Region	Income level	Source and period
Russian Federation	Europe & Central Asia	High income	United Nations (2008-2010)
Slovak Republic	Europe & Central Asia	High income	United Nations (1995-2010); OECD (2011)
Slovenia	Europe & Central Asia	High income	United Nations (1995-2010) ; OECD (2011)
Spain	Europe & Central Asia	High income	United Nations (1995-2010) ; OECD (2011)
Sweden	Europe & Central Asia	High income	United Nations (1993-2011); OECD (2012)
Switzerland	Europe & Central Asia	High income	United Nations (1990-2010); OECD (2011)
United Kingdom	Europe & Central Asia	High income	United Nations (1990-2010); OECD (2011-2012)
Bolivia	Latin America & Caribbean	Lower middle income	United Nations (1999-2008)
Brazil	Latin America & Caribbean	Upper middle income	United Nations (1995-2009); Centro de Estudios do IBMEC (2010-2011)
Colombia	Latin America & Caribbean	Upper middle income	United Nations (1994-2009); National Administration Department of Statistics (2010-2011)
Ecuador	Latin America & Caribbean	Upper middle income	Central Bank of Ecuador (2007-2009)
Guatemala	Latin America & Caribbean	Lower middle income	United Nations (2001-2009); Central Bank of Guatemala (2010-2011)
Honduras	Latin America & Caribbean	Lower middle income	United Nations (2000-2008); Central Bank of Honduras (2009-2010)
Mexico	Latin America & Caribbean	Upper middle income	United Nations (1993-2002); National Institute of Statistics and Geography (2003-2011)

Table A.1., continued

Country	Region	Income level	Source
Chile	Latin America & Caribbean	High income	United Nations (1996-2010); Central Bank of Chile (2011)
Egypt	Middle East & North Africa	Lower middle income	United Nations (1996-2009)
Iran	Middle East & North Africa	Upper middle income	United Nations (1996-2007)
Morocco	Middle East & North Africa	Lower middle income	United Nations (1998-2009)
Tunisia	Middle East & North Africa	Upper middle income	United Nations (1997-2009)
Kuwait	Middle East & North Africa	High income	United Nations (2002-2009)
Saudi Arabia	Middle East & North Africa	High income	United Nations (2002-2009)
Canada	North America	High income	Statistics Canada (1980-2010)
United States	North America	High income	United Nations (1998-2010)
India	South Asia	Lower middle income	United Nations (1999-2010)
Burkina Faso	Sub-Saharan Africa	Low income	United Nations (1999-2009)
Cameroon	Sub-Saharan Africa	Lower middle income	United Nations (1996-2003)
Guinea	Sub-Saharan Africa	Low income	United Nations (2003-2010)
Niger	Sub-Saharan Africa	Low income	United Nations (1995-2011)
South Africa	Sub-Saharan Africa	Upper middle income	United Nations (1997-2011)