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Does Public Debt Crowd Out Corporate Investment? International Evidence

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Abstract

Using data for advanced and emerging economies, we show that there is a negative correlation between public debt and corporate investment. Industry-level regressions show that high levels of government debt are particularly damaging for industries that need more external financial resources. Firm-level regressions show that government debt increases the sensitivity of corporate investment to cash flow. These results indicate that the relationship between public debt and investment is likely to be causal and that public debt crowds out corporate investment by tightening credit constraints.

Keywords: Investment, Public Debt, Crowding Out, Credit Constraints.
JEL Codes: E22, E62, H63

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1 Introduction

The global financial crisis was followed by a massive increase in public sector borrowing. Total outstanding public debt nearly doubled from $35 trillion in 2007 to $66 trillion in 2017. Over the same period, public debt increased from 71 to 105 percent of GDP in advanced economies and from 36 to 48 percent of GDP in emerging and developing economies (International Monetary Fund, 2017).

This rapid increase in government debt sparked a large literature aimed at estimating the effect of public sector borrowing on economic activity. Following the influential contributions of Reinhart and Rogoff (2010), a large number of papers used country-level data to establish the presence of a negative correlation between government debt and each of economic growth and investment (e.g., Cecchetti, Mohanty and Zampolli, 2011, Checherita-Westphal and Rother, 2012, and Kumar and Woo, 2015), but also highlighted the presence of substantial cross-country heterogeneity (Eberhardt and Presbitero, 2015, and Kourtellos, Stengos, and Tan, 2013), and challenged the presence of debt thresholds (Chudik, Mohaddes, Pesaran, and Raissi, 2017). However, the cross-country literature has been less successful in establishing the presence of a causal link going from pubic debt to economic growth (Panizza and Presbitero, 2013 and Panizza and Presbitero, 2014).

Reverse causality is a particularly important issue for the study of the link between debt and growth. Traditional Keynesian policies and neoclassical models of optimal fiscal policy (Barro, 1979) suggest that countries should run deficits, and hence accumulate debt, in bad times and surpluses in good times. If shocks to growth are persistent (Cerra and Saxena, 2008), the presence of a countercyclical fiscal policy can generate a long-run negative correlation between debt and growth, where it is low growth that causes high debt and not the other way around.

In this paper, we focus on corporate investment and provide a direct test for the crowding out effect emphasized by the economic literature by showing that government debt reduces investment by tightening the credit constraints faced by private firms. Using data for nearly 550,000 firms in 69 countries over 1998-2014, we show that higher levels of government debt are associated with lower private investment and with an increase of the sensitivity of investment to internally generated funds. Our results

are related to the findings of Greenwood, Hanson, and Stein (2010), Graham, Leary and Roberts (2015), and Demirci, Huang, and Sialm (2017) who describe the relationship between the structure and level of government debt and corporate leverage. While these authors focus on firms' capital structure, we study the behavior of corporate investment and thus describe a channel through which public debt directly affects economic activity.

Standard models of crowding out focus on the interest rate channel: an increase in government spending puts upward pressure on interest rates which, in turn, leads to lower private investment (Elmendorf and Mankiw, 1999). The mechanism through which public debt crowds out private investment can also go through quantities instead of prices. In the presence of credit rationing and financial frictions, government debt can be particularly deleterious for firms which have restricted access to credit (Broner, Erce, Martin, and Ventura, 2014). We test this hypothesis by studying whether the crowding effect of public debt is stronger for firms which are more likely to be credit constrained; namely, unlisted, small and medium-sized, and young firms.

We start by describing the country-level correlation between investment and public debt. While these simple correlations do not provide any evidence of causality, they are suggestive in indicating that higher government debt is associated with lower investment ratios. They also show that the negative correlation between public debt and investment which is present in national accounts data is robust to measuring investment with aggregates obtained from our firm-level data. Next, we turn to firm-level data and show that there is a negative correlation between investment and government debt.

To move beyond correlations and address endogeneity concerns, we first use an empirical strategy that builds on Rajan and Zingales (1998) and show that high levels of government debt are particularly damaging for industries that, for technological reasons, need more external financial resources. Next, we build on Love (2003) and Huang, Pagano, and Panizza (2017) and use firm-level data to show that the sensitivity of investment to internal funds (a standard indicator of the presence of credit constraints, Fazzari, Hubbard, and Petersen, 1988) increases with the level of government debt. We address the Kaplan and Zingales (2000) critique to the methodology originally developed by Fazzari, Hubbard, and Petersen (1988) by showing that there is substantial

heterogeneity across types of firms and that government debt increases the sensitivity of investment to cash flow for firms that are more likely to be credit constrained (unlisted, smaller, and younger firms) but does not have any effect on the investment-cash flow sensitivities of listed, larger, and older firms.

Our empirical approach focuses on within-country-year variation. Therefore, it controls for all macroeconomic shocks that can jointly affect public debt and investment and rules out any concern of reverse causality linked to fact that governments may decide to run deficits (and accumulate debt) during recessions.

2 Data

We merge firm-level variables from the Orbis database provided by Bureau van Dijk with country-level variables from the International Monetary Fund's World Economic Outlook (IMF-WEO) database and the World Bank Development Indicators. Tables A1 and A2 in the Appendix report descriptive statistics and a detailed description (including sources and definitions) for all the variables used in the paper.

Our key firm-level variables are Investment, Cash Flow, and Sales. Investment is defined as change in fixed assets plus depreciation and amortization. Cash Flow and Sales are taken from balance sheet data directly. We scale all firm-level variables with total assets and Winsorize the resulting ratios at 5 percent.

Orbis provides comprehensive information on balance-sheet and ownership data for a large number of firms, both listed and unlisted, in more than 60 countries. Kalelmi-Özcan, Sorensen, Villegas-Sanchez, Volosovych, and Yesilitas (2015) describe the main challenges related to using Orbis data for cross-country studies and provide suggestions for effectively using this dataset. We follow the steps listed in Section 5 of Kalelmi-Özcan et al. (2015) and prepare our dataset by dropping firms with at least one negative value for total assets (and other measures of assets), sales, and number of employees. We also drop firm-years with missing information for total assets, and drop firms with very large percentage changes in total assets.

Our full sample consists of an unbalanced panel of 537,526 firms in 69 countries over the period 1998-2014 (Tables A3 and A4 in the Appendix provide details on sample coverage). While these firms span across 332 industries, we follow Love (2003) and

do not include firms for which the primary industry is either financial or professional services. Our sample is highly unbalanced and goes from about 2,500 firms spanning 21 countries and 192 industries in 1998 to nearly 500,000 firms spanning 69 countries and 329 industries in 2013. We show that our baseline results are robust to restricting the analysis to a more balanced sample of firms.

At the country level, our main variable of interest is general gross government debt over GDP which we source from the IMF-WEO dataset.[1] The overall sample mean for this variable is 54 percent (Table A1) with a standard deviation of 35 and a range that goes from basically zero (Hong Kong in 2014) to 250 percent (Japan in 2014). In 1998, average debt for the 21 countries included in our sample was 61 percent of GDP (Table A5 in the Appendix), it decreased to 45 percent of GDP in 2007 (67 countries), and was back to 61 percent of GDP in 2014 (68 countries).

We also merge country-level debt-to-GDP ratios with industry-level investment rates sourced from UNIDO's Industrial statistics database (specifically, INDSTAT 4 2017 ISIC Revision 4). Our industry-level sample covers 73 countries and 23 industries for the period 2000-2011.

3 Country and firm-level correlations

We begin by estimating a set of simple country-level regressions examining the correlation between total investment and general government debt conditional on country and year fixed effects:

$$I_{c,t} = \beta GD_{c,t} + \theta_c + \tau_t + \epsilon_{c,t} \tag{1}$$

where $I_{c,t}$ is a measure of country-level investment in country c and year t, $GD_{c,t}$ is the ratio of general gross government debt to GDP in country c and year t, and θ_c and τ_t are country and year fixed effects respectively.

We estimate three variants of this specification. We start by measuring $I_{c,t}$ as total investment to GDP ratio using national accounts data and by estimating the

[1] General government gross debt is defined as follows: all liabilities that require payment or payments of interest and/or principal by the debtor to the creditor at a date or dates in the future. This includes debt liabilities in the form of SDRs, currency and deposits, debt securities, loans, insurance, pensions and standardized guarantee schemes, and other accounts payable.

model using all available observations in the IMF-WEO dataset (172 countries over the period 1980-2016 for a total of 3,814 observations). We find a negative and statistically significant correlation between public debt and investment with a point estimate which implies that a one standard deviation increase in the public debt-to-GDP ratio (49 percentage points in this sample) is associated with a 1.9 percentage point decrease in investment-to-GDP (Column 1 of Table 1). Given that the average investment-to-GDP ratio in this sample is 23.7 percent, the point estimate suggest that a one standard deviation increase in government debt is correlated with a 10 percent decrease in the investment ratio.

Next, we estimate Equation (1) using national accounts data but restricting the sample to country-years for which we have firm-level data (Column 2 of Table 1). The correlation between public debt and investment remains negative and statistically significant and the point estimate now suggests that a one standard deviation increase in the public debt-to-GDP ratio (35 percentage points in the sample comparable to our firm-level sample) is associated with a 4.5 percentage points decrease in investment-to-GDP (the average investment to GDP ratio in this sample is 24 percent).

Finally, we estimate the model by replacing national accounts data with firms' investment (scaled by total assets) aggregated to the country-year level (Column 3 of Table 1) and find that a one standard deviation increase in the debt-to-GDP ratio is associated with a 2.4 percentage point decrease in the investment ratio (the average investment ratio being 9.8 percent).

Having established that when we aggregate our measure of firm-level investment to the national level we can reproduce the negative correlation between investment and government debt observed in the national accounts, we now study the firm-level correlation between investment and public debt, conditional on firm, country, and year fixed effects. Specifically, we estimate the following model:

$$I_{i,c,t} = \gamma GD_{c,t} + \alpha_i + \theta_c + \tau_t + \epsilon_{i,c,t} \tag{2}$$

where I is investment in fixed capital of firm i in country c in year t, $GD_{c,t}$ is the ratio of general gross government debt to GDP in country c and year t, and α_i, θ_c and τ_t are firm, country and year fixed effects, respectively. We estimate this specification with

robust standard errors clustered at the country-year and at the firm-level.

We find that the parameter γ is negative and statistically significant (Column 4, Table 1). The point estimate suggests that a one standard deviation increase in government debt (about 35 percentage points) is associated with a 0.6 percentage points decrease in firms' investment ratio (about 12 percent the average investment ratio which, in our sample, is 6 percent). In column 5 of Table 1, we estimate the same model of column 4 but restrict the sample to 2005-2014 (this is the sample that we use in our baseline regressions). The results are almost identical to those of column 4.

4 Moving beyond correlations: Industry-level evidence

While suggestive, the correlations of Table 1 may be driven by reverse causality or by the presence of unobservable factors which are jointly correlated with investment opportunities and the level of public debt.

To allay endogeneity concerns, we use industry-level data and the index of external financial dependence originally developed by Rajan and Zingales (1998) to test whether government debt has a stronger negative impact on the investment rate of industries that, for technological reasons, need more external financial resources.

External financial resources needs are defined as the "amount of desired investment that cannot be financed through internal cash flows generated by the same business" (Rajan and Zingales, 1998, p. 564) and computed as the share of capital expenditure that cannot be financed using cash flow from operations. The index is generated using a sample of large publicly traded US firms. These large firms which operate in one of the most developed financial markets are less likely to face credit constraints with respect to smaller firms operating in countries with less developed financial markets. Hence, their actual use of external financial resources is more likely to be a good measure of the demand for these funds which, in turn, is driven by technological reasons.

We use an updated version of the index of external financial dependence for 1980-1999 taken from Kroszner, Laeven, and Klingebiel (2007) to estimate the following

model:

$$I_{j,c,t} = \beta I_{j,c,t-1} + \delta \left(EF_j \times GD_{c,t-1} \right) + \alpha_{cj} + \theta_{ct} + \tau_{jt} + \epsilon_{j,c,t} \tag{3}$$

where I is the log of industry-level gross fixed capital formation for industry j in country c in year t, EF is an industry-specific measure of external financial dependence (EF is country and time invariant), GD is the ratio of general gross government debt to GDP in country c and year t, and α_{cj}, θ_{ct}, and η_{jt} are country-industry, country-year, and industry-year fixed effects, respectively.[2]

The inclusion of this rich set of fixed effects means that we are estimating within-country-year differences between industries and hence can rule out most estimations problems related to reverse causality, omitted variables, and model specification. Specifically, the inclusion of country-year fixed effects rules out reverse causality associated with the presence of countercyclical fiscal policy and the joint inclusion of country-year and industry-year fixed effects absorbs all possible country and industry-level demand shocks.

If government debt tightens financing constraints, we should observe that industries that are more dependent on external finance will have relatively lower investment rates in country-years with higher levels of government debt. Hence, we should find that the coefficient for the interaction between external financial dependence and government debt (δ in Equation 3) is negative and statistically significant. This is what we find in column 1 of Table 2 which shows that the point estimate of δ is close to -1 and is statistically significant at the one percent confidence level.

Equation 3 is essentially a difference-in-difference model and δ is analogous to a second derivative. Rajan and Zingales (1998) suggest that one way to describe the magnitude of the interactive coefficient is to evaluate it at the 25^{th} and 75^{th} percentiles of the distributions of the industry-level index of external finance and the country-level measure of government debt. In our case, the industry at the 25^{th} percentile of external financial dependence is Metal Products with a value of the index of -0.25 and the industry at the 75^{th} percentile is Wood Products with a value of the index of 0.05.

[2] Our sample covers 73 countries and 23 industries for the period 2000-2011. Data for industry-level investment (gross fixed capital formation) are sourced from the United Nations Industrial Development Organization's INDSTAT database (specifically, INDSTAT 4 2017 ISIC Revision 4). As the index of external financial dependence was compute using ISIC Revision 2, we convert the industry-level data from ISIC Revision 4 to Revision 2.

The country-year at the 25^{th} percentile of the distribution of government debt over GDP is Finland in 2006 with a value of 34 percent and the country-year at the 75^{th} percentile of the distribution is India in 2009 with a value of 68 percent. Our point estimate of -1 suggests that the difference between investment in metal products and investment in wood products in India is 25 percent higher than the difference between investment in metal products and investment in wood products in Finland.

While the fixed effects rule out most types of reverse causality and omitted variable biases, our results could be biased by the fact that we are not controlling for the interaction between financial dependence and country-level variables which are jointly correlated with the level of government debt and the presence of credit constraints (the main effects of all possible country-year shocks are controlled for by the country-year fixed effects).

One obvious candidate is financial depth (proxied by credit to the private sector). As this variable is positively correlated with the level of government debt (see Table A6 in the appendix) and is negatively correlated with the presence of financial constraints, its exclusion from the model should generate a upward bias in the estimate of δ.[3]

We find that our baseline result is robust to controlling for the interaction between external finance needs and financial depth and that this latter interaction is not significantly correlated with industry-level investment (column 2 of Table 2).

Next, we augment our model with the interaction between external finance needs and economic size (measured by the log of GDP) and with the interaction between external finance needs and the level of economic development (measured by the log of GDP per capita). We find that the inclusion of these interactions strengthens our baseline results (columns 3 and 4 of Table 2). We also show that our baseline results are robust to augmenting the model with the interaction between external finance and each of GDP growth and overall government budget balance (columns 5 and 6 of Table 2). Finally, we show that our baseline results are robust to jointly including all these

[3]Suppose that the true model is $I_{j,c,t} = \beta I_{j,c,t-1} + \delta\left(EF_j \times GD_{c,t-1}\right) + \gamma\left(EF_j \times FD_{c,t-1}\right) + \alpha_{cj} + \theta_{ct} + \tau_{jt} + \epsilon_{j,c,t}$ and we estimate where FD is financila depth and $\gamma > 0$. Further assume that there is a positive correation between financila depth and goverment debt and define the covariance of these two variables as $\sigma_{GD,FD} = cov(GD, FD) > 0$ (where $GD = EF_j \times GD_{c,t}$ and $FD = EF_j \times FD_{c,t}$) Then, if we estimate $I_{j,c,t} = \beta I_{j,c,t-1} + d\left(EF_j \times GD_{c,t-1}\right) + \alpha_{cj} + \theta_{ct} + \tau_{jt} + \epsilon_{j,c,t}$ the bias will be: $E(d) - \delta = \gamma \frac{\sigma_{GD,FD}}{\sigma^2_{GD}} > 0$

interactions in the same regression (Column 7 of Table 2).

5 Public debt and firm-level financial constraints

With perfect financial markets (and without tax distortions) firm financial structure is irrelevant for investment decisions. In the absence of financial frictions, firms can either borrow or issue new equity without facing any additional cost with respect of that of internal funds. However, asymmetric information and imperfect contract enforcement increase the monitoring and evaluation costs faced by providers of external finance and create a wedge between the cost of external funds (both debt and equity) and the opportunity cost of internal funds. Therefore, in the presence of financial frictions, there will be a "pecking order" for firm financing, implying that firms first use internal sources to finance investment and only seek outside funds when those are exhausted (Myers 2004).

A classic paper by Fazzari, Hubbard, and Petersen (1988) suggested that the presence of credit constraints can be assessed by studying the correlation between firm-level investment and internally generated funds (proxied by cash flow). Love (2003) builds on this idea to assess whether financial depth relaxes credit constraints by reducing the sensitivity of investment to internally generated funds. Huang, Pagano, and Panizza (2017) use a similar strategy to assess whether local government debt tightens credit constraints for Chinese firms.[4]

We build on this literature and estimate the following baseline specification:

$$I_{i,c,t} = \beta I_{i,c,t-1} + \delta S_{i,c,t} + (\gamma_1 + \gamma_2 GD_{c,t}) CF_{i,c,t} + \alpha_i + \theta_{ct} + \epsilon_{i,c,t} \tag{4}$$

where I, S, CF are investment in fixed capital, sales, and cash flow of firm i in country c in year t, $GD_{c,t}$ is the ratio of general gross government debt to GDP in country c and year t, and α_i and θ_{ct} are firm and country-year fixed effects respectively.

Within the set up of equation 4, γ_1 measures the correlation between cash flow and investment (the original Fazzari et al., 1988, measure of credit constraints) when $GD = 0$, and γ_2 measures how the correlation between cash flow and investment varies

[4]Forbes (2007) uses a simiral specifictaion to evaluate the effects of capital controls in Chile.

with the level of public debt. A positive value of γ_2 is consistent with the hypothesis that government debt tightens financing constraints for private firms, in line with the theoretical predictions of Broner, Erce, Martin and Ventura (2014).

Given the limited country-coverage of Orbis for 1998-2004, we estimate our baseline regressions for 2005-14 but our results are robust to estimating our model for the 1998-2014 period (Tables A7 and A8 in the Appendix).

As our estimate of γ_2 relies only on within-firm variation of investment and cash flow and within-country-year variation of government debt, it controls for all country-year specific shocks and rules out reverse causality concerns associated with the presence of countercyclical fiscal policy. However, as in the case of the industry-level estimates of the previous section, our results could be biased by the presence of country-level variables that are jointly correlated with government debt and the cyclical presence of financing constraints. We discuss this issue in the robustness analysis below.

Column 1 of Table 3 shows the estimates of Equation 4 for a sample that includes all firms and countries for the 2005-14 period. We find that both γ_1 and γ_2 are positive and statistically significant at the one percent confidence level. The point estimates imply that one standard deviation increase in government debt (35 percentage points) is associated with a 5 percent increase in the elasticity of investment to cash flow, supporting the idea that public debt tightens the financing constraints faced by private firms.[5]

The Fazzari et al. (1988) approach has been criticized by Kaplan and Zingales (2000) who, among other things, pointed out that cash flow may proxy for investment opportunities. However, our estimate for γ_2 would be biased only if cash flow is more likely to proxy for investment opportunities in country-years when debt is higher. We cannot think of any reason why this should be the case.

To address the Kaplan and Zingales critique, we also recognize that if government debt tightens financing constraints not all borrowers should be affected equally. Specifically, we expect to see a larger effect for riskier borrowers, including borrowers with less pledgeable collateral and higher monitoring costs. To test this hypothesis we use three different sample splits aimed at separating riskier from safer firms and check whether γ_2 is larger in the sample of riskier firms which are more likely to be credit

[5] To improved readibility, we divided sales and cash flow by 100.

constrained.

In our first sample split, we estimate separate regressions for listed and unlisted firms. We find that γ_2 is positive and statistically significant in the sample of unlisted firms and much smaller and not statistically significant in the sample of listed firms (Columns 2 and 3 of Table 3).

Next, we run separate regressions for large and small and medium firms and find that γ_2 is close to zero (and not statistically significant) in the sample that only includes large firms and positive and statistically significant for small and medium firms (Columns 4 and 5 of Table 3).

Finally, we split the sample between old and young firms and, again, find that γ_2 is larger and statistically significant for young firms and basically zero for old firms (Columns 6 and 7 of Table 3).

As discussed above, omitting the correlation between cash flow and country specific variables that are jointly correlated with government debt and the presence of credit constraints may lead to biased estimates. For instance, the omission of the interaction between cash flow and financial depth (a variable which is positively correlated with government debt, see Table A6 in the Appendix, and that is likely to ameliorate financial constraints, see Love, 2003) could lead to a downward bias in our estimate of γ_2.

In Table 4 we augment the regressions of Table 3 with the interaction between financial depth and cash flow. Besides corroborating Love's (2003) original finding that this variables reduces the correlation between investment and cash flows and it is thus likely to ameliorate financing constraints, we also find that controlling for financial depth does not affect our baseline result (column 1, Table 4). Columns 2-7 of Table 4 show that all the results of Table 3 are robust to controlling for financial depth.

Finally, we augment the model of Table 4 with the interaction between cash flow and each of log GDP, log GDP per capita, GDP growth, and government budget balance. We start by adding one interaction at a time (columns 1-4 of Table 5) and then we jointly include all these interactions (columns 5 of Table 5). Including these interactions strengthen our baseline result with γ_2 increasing from 0.01 in the baseline of Table 4 to about 0.025 in columns 1-4 of Table 5 and 0.06 in column 5 of Table 5.

In the Appendix (Tables A7-A12), we report a set of robustness checks showing

that our results do not change when we estimate out model for the 1998-2014 period, when we only include countries with at least 100 firms, when we weight observations by the inverse of the number of firms in each country-year (so that, each country-year has a total weight of one), when we drop the three countries with the largest number of firms in Orbis (France, Italy, and Spain), and when we estimate our baseline model on a balanced sample of firms.

6 Conclusions

While economists disagree on the effects of fiscal policy on aggregate economic activity (Perotti, 2008) most macroeconomic models agree in predicting that fiscal deficits, and the subsequent increase in public debt, should reduce private investment when measured as a share of total aggregate demand.[6]

This consensus notwithstanding, it is difficult to use cross-country data to move beyond correlations and show that public debt has a causal effect on private investment. In this paper, we use industry and firm-level data and show that, controlling for all possible country-year shocks, higher levels of public debt reduce investment for industries that need more external financial resources. We also show that public debt increases the sensitivity of investment to internally generated funds for firms that are, ex-ante, more likely to be credit constrained.

Besides addressing most endogeneity and model specification concerns and, therefore, providing evidence of a causal link going from debt to private investment, our empirical exercises allow us to test for the presence of a credit rationing channel by showing that public debt is particularly damaging for credit constrained firms.

Two caveats are in order. First, there is a trade-off between our ability to identify the causal effects of debt and that of estimating its aggregate effect on the economy. While the regressions of Table 1 show that there is a negative correlation between investment and public debt, these are simple correlations that cannot tell us anything about causality. The regressions of Tables 2 -5, instead, control for country-year fixed

[6] Total private investment may still increase (or decrease less than what it would have done without the expansionary fiscal policy) if the fiscal policy leads to a large increase in aggregate demand, but investment as a share of GDP is supposed to decrease.

effects and give us a cleaner identification strategy. However, in these regressions we only observe within country-year differences and cannot say anything about the effect of debt on total investment (all macroeconomic effects are captured by the fixed effects). Therefore, it would be possible that higher levels of debt increase investment for all industries and firms, but that investment increases less for firms that are more likely to face credit constraints.

Second, we focus on just one component of aggregate demand. Hence, we cannot say anything on the desirability of the fiscal expansion that followed the global financial crisis and on the desirability of Keynesian policies, more in general. As mentioned, our findings are consistent with the most basic Keynesian models which predict that fiscal expansions are desirable when the economy enters into recession.

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Table 1: **Country and Firm Level Correlations**

This table reports the results of a set of regressions where the dependent variable is either the country-level investment-to-GDP ratio (columns 1 and 2), or the country-level investment-to-assets ratio (column 3), or the firm-level investment-to-assets ratio (columns 4 and 5), and the explanatory variable is government debt over GDP (GD_t). Column 1 uses all observations available from the IMF's World Economic Outlook Database (172 countries for the period 1980-2016), column 2 only includes the subset of country-years which are included in our firm-level sample (68 countries for the period 1998-2014), column 3 uses a country–year-level investment variable aggregated from firm-level balance sheet data (68 countries for the period 1998-2014), column 4 uses firm-level data for 1998-2014, and column 4 uses firm-level data for 2005-2014 (this is the period used in our baseline firm-level regressions of Tables 3, 4, and 5). In columns 1-3 the standard errors are clustered at the country-level and in columns 4 and 5 the standard errors are two-way clustered at the country-year and firm-level.

	(1)	(2)	(3)	(4)	(5)
GD_t	-0.038***	-0.126***	-0.049***	-0.032**	-0.033**
	(0.009)	(0.020)	(0.001)	(0.014)	(0.014)
N. Obs	3,814	879	879	3,759,640	3,685,637
N. Countries	172	68	68	69	69
Firm FE	NO	NO	NO	YES	YES
Country FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Level	Country	Country	Country	Firm	Firm
Period	1980-2016	1998-2014	1998-2014	1998-2014	2005-2014
Source	IMF WEO	IMF WEO	Orbis	Orbis	Orbis

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table 2: **Industry-Level Regressions**

This table reports the results of a set of regressions where the dependent variable is the log of industry level investment (I_t) and the explanatory variables are the log of initial investment (I_{t-1}), and the interaction between the index of dependence on external finance (EF_j) from Kroszner et al. (2007) and initial levels of each of government debt over GDP (GD_{t-1}), domestic credit to the private sector over GDP (DCP_{t-1}), the log of GDP ($lnGDP_{t-1}$), the log of GDP per capita ($lnGDPpc_{t-1}$), GDP growth ($grGDP_{t-1}$), and government balance over GDP (GB_{t-1}). The regressions cover 60 countries for 2001-2010. The standard errors are clustered at the country-industry-level.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
I_{t-1}	0.144***	0.142***	0.145***	0.145***	0.144***	0.143***	0.143***
	(0.028)	(0.028)	(0.028)	(0.028)	(0.028)	(0.028)	(0.028)
$EF_j \times GD_{t-1}$	-0.976***	-0.979**	-1.123***	-1.063***	-0.968**	-0.986**	-1.284***
	(0.375)	(0.398)	(0.417)	(0.409)	(0.402)	(0.386)	(0.438)
$EF_j \times DCP_{t-1}$		0.035					0.116
		(0.285)					(0.310)
$EF_j \times lnGDP_{t-1}$			-0.319				-3.203*
			(0.318)				(1.704)
$EF_j \times lnGDPpc_{t-1}$				-0.200			2.599
				(0.303)			(1.601)
$EF_j \times grGDP_{t-1}$					0.137		0.472
					(1.477)		(1.425)
$EF_j \times GB_{t-1}$						2.581	2.575
						(1.721)	(1.982)
N. Obs.	5,624	5,433	5,624	5,624	5,624	5,624	5,433
N. Countries.	60	60	60	60	60	60	60
Ctry-Ind. FE	YES	YES	YES	YES	YES	YES	YES
Ctry-Yr FE	YES	YES	YES	YES	YES	YES	YES
Ind.-Yr FE	YES	YES	YES	YES	YES	YES	YES

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 3: **Investment Cash Flow Sensitivities: Baseline**

This table reports the results of a set of regressions where the dependent variable is firm-level investment (I_t) and the explanatory variables are lagged investment (I_{t-1}), sales (S_t), cash flow (CF_t), and the interaction between CF_t and government debt over GDP (GD_t). All firm-level variables are scaled by total assets at the beginning of the period. The first column uses all firms in our sample, column 2 only includes listed firms, column 3 only includes unlisted firms, column 4 only includes large firms, column 5 only includes small and medium firms, column 6 only includes firms that are older than 10 years (at the beginning of the sample), and column 7 only includes firms that are younger than 10 years (at the beginning of the sample). The regressions cover 69 countries for 2005-2014. The standard errors are clustered at the firm-level.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
I_{t-1}	-0.073***	-0.046***	-0.073***	-0.043***	-0.074***	-0.067***	-0.082***
	(0.001)	(0.004)	(0.001)	(0.003)	(0.001)	(0.001)	(0.001)
S_t	2.381***	3.788***	2.366***	3.005***	2.364***	2.465***	2.288***
	(0.013)	(0.132)	(0.013)	(0.074)	(0.013)	(0.017)	(0.019)
CF_t	9.183***	21.495***	8.559***	19.574***	8.508***	9.795***	8.124***
	(0.271)	(1.371)	(0.277)	(1.116)	(0.279)	(0.344)	(0.439)
$CF_t \times GD_t$	0.010***	0.004	0.013***	0.002	0.012***	0.001	0.024***
	(0.003)	(0.014)	(0.003)	(0.012)	(0.003)	(0.004)	(0.005)
N. Obs.	3,031,244	84,928	2,946,284	148,836	2,882,331	1,946,012	1,085,179
N. Firms	537,526	15,739	521,784	26,681	510,832	322,622	214,898
Firm FE	YES	YES	YES	YES	YES	YES	YES
Ctry-Yr FE	YES	YES	YES	YES	YES	YES	YES
Sample	All	Listed	Unlisted	Large	SME	Old	Young

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table 4: **Controlling for Credit to the Private Sector**

This table reports the results of a set of regressions where the dependent variable is firm-level investment (I_t) and the explanatory variables are lagged investment (I_{t-1}), sales (S_t), cash flow (CF_t), and the interaction between CF_t and each of government debt over GDP (GD_t) and domestic credit to the private sector over GDP (DCP_t). All firm-level variables are scaled by total assets at the beginning of the period. The first column uses all firms in our sample, column 2 only includes listed firms, column 3 only includes unlisted firms, column 4 only includes large firms, column 5 only includes small and medium firms, column 6 only includes firms that are older than 10 years (at the beginning of the sample), and column 7 only includes firms that are younger than 10 years (at the beginning of the sample). The regressions cover 69 countries for 2005-2014. The standard errors are clustered at the firm-level.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
I_{t-1}	-0.073***	-0.046***	-0.073***	-0.043***	-0.074***	-0.067***	-0.082***
	(0.001)	(0.004)	(0.001)	(0.003)	(0.001)	(0.001)	(0.001)
S_t	2.382***	3.788***	2.367***	3.006***	2.365***	2.464***	2.288***
	(0.013)	(0.132)	(0.013)	(0.074)	(0.013)	(0.017)	(0.019)
CF_t	10.879***	22.516***	11.397***	17.149***	11.293***	12.125***	8.910***
	(0.412)	(1.914)	(0.425)	(1.543)	(0.428)	(0.522)	(0.667)
$CF_t \times DCP_t$	-0.016***	-0.011	-0.026***	0.026**	-0.026***	-0.022***	-0.007
	(0.003)	(0.014)	(0.003)	(0.012)	(0.003)	(0.004)	(0.005)
$CF_t \times GD_t$	0.009***	0.010	0.011***	-0.006	0.010***	0.000	0.023***
	(0.003)	(0.015)	(0.003)	(0.013)	(0.003)	(0.004)	(0.005)
N. Obs.	3,031,244	84,928	2,946,284	148,836	2,882,331	1,946,012	1,085,179
N. Firms	537,526	15,739	521,784	26,681	510,832	322,622	214,898
Firm FE	YES	YES	YES	YES	YES	YES	YES
Ctry-Yr FE	YES	YES	YES	YES	YES	YES	YES
Sample	All	Listed	Unlisted	Large	SME	Old	Young

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table 5: **Additional Controls**

This table reports the results of a set of regressions where the dependent variable is firm-level investment (I_t) and the explanatory variables are lagged investment (I_{t-1}), sales (S_t), cash flow (CF_t), and the interaction between CF_t and each of government debt over GDP (GD_t), domestic credit to the private sector over GDP (DCP_t), the log of GDP ($lnGDP_t$), the log of GDP per capita ($lnGDPpc_t$), GDP growth ($grGDP_t$), and government balance over GDP (GB_t). All firm-level variables are scaled by total assets at the beginning of the period. The regressions covers 69 countries for 2005-2014. The standard errors are clustered at the firm-level.

	(1)	(2)	(3)	(4)	(5)
I_{t-1}	-0.073***	-0.073***	-0.073***	-0.073***	-0.073***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
S_t	2.381***	2.378***	2.383***	2.379***	2.376***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
CF_t	17.107***	19.558***	9.300***	10.593***	21.393***
	(0.663)	(0.731)	(0.423)	(0.412)	(0.772)
$CF_t \times DCP_t$	-0.002	-0.000	-0.012***	-0.008**	0.018***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
$CF_t \times GD_t$	0.025***	0.024***	0.023***	0.027***	0.062***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)
$CF_t \times lnGDP_t$	-1.286***				-0.951***
	(0.102)				(0.126)
$CF_t \times lnGDPpc_t$		-3.357***			-2.842***
		(0.224)			(0.278)
$CF_t \times grGDP_t$			0.428***		0.311***
			(0.027)		(0.029)
$CF_t \times GB_t$				0.471***	0.477***
				(0.029)	(0.032)
N. Obs.	3,031,244	3,031,244	3,031,244	3,031,244	3,031,244
N. Firms	537,526	537,526	537,526	537,526	537,526
Firm FE	YES	YES	YES	YES	YES
Ctry-Yr FE	YES	YES	YES	YES	YES
Sample	All	All	All	All	All

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Appendix

Table A1: **Summary Statistics**

	Mean	**Median**	**Std. Dev.**	**Min**	**Max**	**P25**	**P75**	**N**
Firm-level variables								
I	5.35	2.39	8.62	-4.89	30.20	0.16	7.63	3,759,820
S	186.64	156.85	126.97	23.53	505.70	93.27	248.11	3,759,820
CF	8.16	6.25	8.49	-5.36	28.76	2.44	12.39	3,759,820
Age	20.53	17.00	15.32	1.00	818.00	10.00	26.00	3,719,535
Industry-level variables								
I	16.85	17.13	2.62	4.17	23.03	15.32	18.74	5624
EF	-0.08	-0.04	0.42	-1.14	0.72	-0.25	0.05	23
Country-year variables								
GD	54.4	46.4	35.4	0.1	249.1	33.8	68.2	887
DCP	81.5	70.7	53.2	9.2	312.2	35.9	115.0	887
GB	-1.9	-2.5	5.7	-32.1	37.4	-4.8	0.1	887
GDP	848.0	230.8	2020.9	7.5	17348.1	79.7	669.3	887
$grGDP$	3.4	3.5	3.6	-14.8	19.6	1.5	5.5	887
$GDPpc$	20.5	14.0	18.9	0.4	96.7	4.7	33.2	887

Firm-level variables are scaled to total assets and expressed as a percentage.
Country-level variables are expressed as a percentage of GDP except GDP (billions), grGDP (% annual change), and GDPpc (thousands).

Table A2: **Variables Description**

Vars	**Description**	**Source**
	Firm-level variables	
FA	Value (after depreciation) of non-current assets (i.e., Intan. ass. + Tang. ass. + Other fixed ass.).	Orbis
DA	Depreciation and Amortization	Orbis
i	$i_t = (FA_t$ - $FA_{t-1}) + DA_t$	Own calculation
ta	Total assets (Fixed assets + Current assets) at the beginning of the period (i.e $t-1$)	Orbis
I	Investment to total assets ratio = i/ta	Own calculation
S	Sales to capital ratio = s/ta	Own calculation
CF	Cash flow to capital ratio = cf/ta	Own calculation
	Industry-level variables	
GCF	Gross Fixed Capital Formation	INDSTAT
I	Log of GCF	Own calculation
EF	Index of dependence on external finance	Kroszner et al. (2007)
	Country-level variables	
GD	General govt. gross debt (% of GDP)	IMF WEO
GB	General govt. net lending/borrowing (% of GDP)	IMF WEO
DCP	Domestic credit to the private sector (% of GDP)	WB GFDD
$grGDP$	Gross domestic product (annual percent change)	WB WDI
GDP	Gross domestic product (current USD, BILLIONS)	WB WDI
$GDPpc$	GDP per capita (current USD, thousands)	WB WDI
I	Total investment (% of GDP)	IMF WEO

Table A3: **Sample Coverage: Over Time**

	Countries	**Industries**	**Firms/Obs**
1998	21	192	2,499
1999	25	199	3,753
2000	31	212	5,900
2001	34	246	8,233
2002	38	250	10,963
2003	44	264	16,365
2004	46	277	23,627
2005	49	291	43,218
2006	52	308	154,094
2007	67	328	373,934
2008	68	331	414,764
2009	68	332	438,202
2010	69	331	461,051
2011	69	331	480,550
2012	69	331	495,704
2013	69	332	492,317
2014	68	329	334,646

Table A4: **Sample Coverage: Across Countries**

Country	N. Firms	N. Obs.	Start Year	Final Year	GD (mean)	GD (sd)
Argentina	68	410	2000	2014	45.0	9.5
Australia	514	3070	1998	2014	21.0	8.0
Austria	2,870	12,362	1999	2014	79.5	5.2
Bahrain	9	60	2007	2014	31.9	10.8
Bangladesh	47	188	2007	2014	35.4	2.3
Belgium	8,639	56,528	1999	2014	100.1	6.1
Botswana	6	32	2007	2014	16.2	4.6
Brazil	256	1,420	2000	2014	63.3	3.1
Bulgaria	15,266	80,366	1998	2014	17.8	5.1
Chile	63	235	2003	2014	8.9	3.2
China	2,532	14,740	2001	2014	34.1	3.7
Colombia	40	140	2000	2014	36	3.8
Croatia	6,696	45,145	2000	2014	61.3	17.6
Cyprus	18	89	2007	2014	69.5	22.3
Czech Republic	19,126	111,460	1998	2014	37.0	6.5
Côte d'Ivoire	27	147	2007	2014	55.3	11.1
Denmark	65	451	1998	2014	42.1	7.4
Ecuador	44	231	2005	2014	22.6	4.0
Egypt	175	890	2002	2014	78.2	9.3
Finland	8,797	57,263	1998	2014	47.5	8.7
France	114,538	775,581	1999	2014	80.7	10.6
Germany	22,520	103,590	1998	2014	74.3	6.3
Ghana	13	73	2007	2014	47.2	13.0
Greece	8,284	53,681	1998	2014	143.9	28.9
Hong Kong	86	589	2002	2014	0.6	0.3
Hungary	17,922	110,933	1998	2014	75.9	5.0
Iceland	191	877	2006	2014	81.1	18.4
India	3,311	15,252	1998	2014	70.1	2.7
Indonesia	303	1,997	2002	2014	26.2	4.1
Ireland	31	197	1998	2014	68.6	36.9
Italy	144,541	960,041	1998	2014	116.2	10.6
Jamaica	14	84	2007	2014	137.7	8.0
Japan	2,028	13,855	1998	2014	220.1	23.6
Jordan	80	533	2002	2014	77.0	11.9
Kazakhstan	43	199	2004	2014	10.0	2.5
Kenya	26	155	2007	2014	42.7	2.1
Kuwait	54	307	2006	2014	8.5	1.9
Lithuania	32	208	2005	2014	31.2	9.9
Malaysia	1,371	7,558	1998	2014	50.1	6.1
Malta	37	122	2007	2013	67.5	2.3
Mexico	96	572	1998	2014	43.3	3.1
Morocco	23	139	2005	2014	54.0	6.3
Namibia	2	10	2010	2014	21.8	3.3
Netherlands	956	4,378	1999	2014	58.5	8.2
Oman	66	486	2003	2014	5.9	1.8
Pakistan	209	901	2003	2014	60.7	3.4
Panama	11	60	2003	2014	42.9	8.8
Peru	108	449	2000	2014	27.4	8.8
Philippines	270	1,104	2003	2014	41.9	3.7
Poland	21,112	118,096	1998	2014	51.6	3.7
Portugal	29,603	184,520	1998	2014	103.7	23.4
Qatar	12	85	2007	2014	30.8	10.5
Republic of Korea	33,942	184,622	2003	2014	31.5	2.7
Russian Federation	68	454	2003	2014	11.3	2.8
Saudi Arabia	80	540	2007	2014	7.1	5.2
Singapore	798	3,627	1998	2014	94.3	6.4
Slovenia	4423	27,379	2004	2014	46.8	19.3
South Africa	91	534	2000	2014	36.5	6.7
Spain	100,125	659,523	1998	2014	60.8	21.3
Sri Lanka	133	635	2007	2014	79.5	3.0
Sweden	14,019	95,552	1998	2014	39.0	2.7
Switzerland	208	1,481	1998	2014	48.6	3.6
Thailand	1,499	8,417	2001	2014	39.8	2.8
Trinidad and Tobago	4	20	2008	2014	35.7	6.6
Tunisia	28	154	2007	2014	45.2	4.1
Turkey	223	1,311	2007	2014	38.5	3.8
United Kingdom	768	4,835	1998	2014	67.0	19.0
USA	4,141	26,039	2001	2014	86.2	17.4
Vietnam	590	2,838	2007	2014	48.6	4.2

Table A5: **Government Debt Over GDP: Summary Statistics By Year**

Year	Mean	Median	Std. Dev.	Min	Max	P25	P75	N. Countries
1998	60.6	59.4	26.6	13.9	121.6	44.1	68.1	21
1999	62.8	59.9	28.3	15.2	135.6	46.3	70.0	25
2000	57.4	51.4	27.6	17.0	143.8	41.9	65.9	31
2001	56.9	51.2	28.3	17.2	153.6	40.8	66.5	34
2002	61.3	53.2	34.3	3.5	164.0	40.2	78.8	38
2003	55.6	49.0	31.0	1.6	169.6	36.6	66.8	44
2004	53.3	46.3	32.2	1.5	180.7	34.4	65.5	46
2005	51.8	44.0	33.1	1.4	186.4	28.5	66.9	49
2006	47.4	39.7	32.0	1.1	186.0	28.4	64.0	52
2007	45.3	39.9	31.1	1.0	183.0	27.2	63.7	67
2008	45.9	41.0	32.4	0.9	191.8	26.8	63.8	68
2009	51.8	44.8	34.8	0.7	210.2	31.0	66.4	68
2010	53.6	44.4	36.4	0.6	215.8	33.8	67.6	69
2011	55.7	45.8	39.6	0.6	231.6	33.1	70.7	69
2012	57.7	46.6	40.6	0.5	238.0	34.1	79.2	69
2013	59.8	46.4	42.0	0.5	244.5	35.0	80.8	69
2014	61.0	48.2	42.3	0.1	249.1	35.1	83.4	68

Table A6: **Correlates of Government Debt**

This table reports correlations between government debt and each of the log of GDP per capita ($lnGDPpc$), the log of GDP ($lnGDP$)GDP growth ($grGDP$), government balance over GDP (GB), and domestic credit to the private sector over GDP (DCP).

	(1)	(2)	(3)	(4)	(5)	(6)
$lnGDPpc$	3.615***					3.431***
	(0.875)					(0.964)
$lnGDP$		4.691***				
		(0.962)				
$grGDP$			-2.995***			-1.379***
			(0.382)			(0.404)
GB				-2.579***		-2.497***
				(0.234)		(0.243)
DCP					0.143***	0.060**
					(0.028)	(0.027)
Constant	45.602***	28.784***	64.487***	49.549***	42.789***	41.062***
	(1.928)	(5.063)	(2.008)	(1.097)	(2.100)	(3.753)
N. Obs.	887	887	887	887	887	887
Firm FE	NO	NO	NO	NO	NO	NO
Ctry-Yr FE	NO	NO	NO	NO	NO	NO

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table A7: **Investment Cash Flow Sensitivities (1998-2014)**

This table reports the results of a set of regressions where the dependent variable is firm-level investment (I_t) and the explanatory variables are lagged investment (I_{t-1}), sales (S_t), cash flow (CF_t), and the interaction between CF_t and government debt over GDP (GD). All firm-level variables are scaled by total assets at the beginning of the period. The first column uses all firms in our sample, column 2 only includes listed firms, column 3 only includes unlisted firms, column 4 only includes large firms, column 5 only includes small and medium firms, column 6 only includes firms that are older than 10 years (at the beginning of the sample), and column 6 only includes firms that are younger than 10 years (at the beginning of the sample). The regressions cover 69 countries for 1998-2014. The standard errors are clustered at the firm-level.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
I_{t-1}	-0.071***	-0.044***	-0.071***	-0.042***	-0.072***	-0.065***	-0.078***
	(0.001)	(0.004)	(0.001)	(0.003)	(0.001)	(0.001)	(0.001)
S_t	2.376***	3.837***	2.360***	3.024***	2.358***	2.459***	2.284***
	(0.013)	(0.128)	(0.013)	(0.074)	(0.013)	(0.017)	(0.019)
CF_t	9.572***	21.867***	8.908***	20.047***	8.887***	10.092***	8.680***
	(0.269)	(1.333)	(0.275)	(1.105)	(0.277)	(0.342)	(0.434)
$CF_t \times GD$	0.007**	0.003	0.010***	0.000	0.009***	-0.001	0.019***
	(0.003)	(0.014)	(0.003)	(0.012)	(0.003)	(0.004)	(0.005)
N. Obs.	3,073,650	88,872	2,984,727	152,212	2,921,318	1,966,259	1,107,301
N. Firms	542,793	16,361	526,427	27,219	515,554	325,076	217,703
Firm FE	YES	YES	YES	YES	YES	YES	YES
Ctry-Yr FE	YES	YES	YES	YES	YES	YES	YES
Sample	All	Listed	Unlisted	Large	SME	Old	Young

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table A8: **Investment Cash Flow Sensitivities: Controlling for Credit to the Private Sector (1998-2014)**

This table reports the results of a set of regressions where the dependent variable is firm-level investment (I_t) and the explanatory variables are lagged investment (I_{t-1}), sales (S_t), cash flow (CF_t), and the interaction between CF_t and each of government debt over GDP (GD_t) and domestic credit to the private sector over GDP. All firm-level variables are scaled by total assets at the beginning of the period. The first column uses all firms in our sample, column 2 only includes listed firms, column 3 only includes unlisted firms, column 4 only includes large firms, column 5 only includes small and medium firms, column 6 only includes firms that are older than 10 years (at the beginning of the sample), and column 6 only includes firms that are younger than 10 years (at the beginning of the sample). The regressions cover 69 countries for 1998-2014. The standard errors are clustered at the firm-level.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
I_{t-1}	-0.071***	-0.044***	-0.071***	-0.042***	-0.072***	-0.065***	-0.078***
	(0.001)	(0.004)	(0.001)	(0.003)	(0.001)	(0.001)	(0.001)
S_t	2.376***	3.837***	2.361***	3.026***	2.359***	2.459***	2.285***
	(0.013)	(0.128)	(0.013)	(0.074)	(0.013)	(0.017)	(0.019)
CF_t	11.270***	22.546***	11.885***	17.195***	11.775***	12.448***	9.412***
	(0.410)	(1.878)	(0.423)	(1.531)	(0.426)	(0.520)	(0.662)
$CF_t \times DCP_t$	-0.016***	-0.007	-0.028***	0.030***	-0.027***	-0.022***	-0.007
	(0.003)	(0.014)	(0.003)	(0.012)	(0.003)	(0.004)	(0.005)
$CF_t \times GD$	0.006*	0.006	0.008**	-0.009	0.007**	-0.002	0.019***
	(0.003)	(0.015)	(0.003)	(0.013)	(0.003)	(0.004)	(0.005)
N. Obs.	3,073,650	88,872	2,984,727	152,212	2,921,318	1,966,259	1,107,301
N. Firms	542,793	16,361	526,427	27,219	515,554	325,076	217,703
Firm FE	YES	YES	YES	YES	YES	YES	YES
Ctry-Yr FE	YES	YES	YES	YES	YES	YES	YES
Sample	All	Listed	Unlisted	Large	SME	Old	Young

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table A9: **Investment Cash Flow Sensitivities: Countries with at least 100 firms**

This table reports the results of a set of regressions where the dependent variable is firm-level investment (I_t) and the explanatory variables are lagged investment (I_{t-1}), sales (S_t), cash flow (CF_t), and the interaction between CF_t and each of government debt over GDP (GD_t) and domestic credit to the private sector over GDP (DCP_t). All firm-level variables are scaled by total assets at the beginning of the period. The first column uses all firms in countries with at least 100 firms, column 2 only includes listed firms, column 3 only includes unlisted firms, column 4 only includes large firms, column 5 only includes small and medium firms, column 6 only includes firms that are older than 10 years (at the beginning of the sample), and column 7 only includes firms that are younger than 10 years (at the beginning of the sample). The regressions cover 38 countries for 2005-2014. The standard errors are clustered at the firm-level.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
I_{t-1}	-0.073***	-0.046***	-0.073***	-0.043***	-0.074***	-0.067***	-0.082***
	(0.001)	(0.005)	(0.001)	(0.004)	(0.001)	(0.001)	(0.001)
S_t	2.381***	3.708***	2.368***	2.970***	2.365***	2.462***	2.289***
	(0.013)	(0.134)	(0.013)	(0.075)	(0.013)	(0.017)	(0.019)
CF_t	10.755***	22.663***	11.391***	16.307***	11.286***	11.967***	8.877***
	(0.413)	(2.080)	(0.425)	(1.622)	(0.428)	(0.525)	(0.668)
$CF_t \times DCP_t$	-0.016***	-0.015	-0.027***	0.023*	-0.026***	-0.022***	-0.008*
	(0.003)	(0.015)	(0.003)	(0.012)	(0.003)	(0.004)	(0.005)
$CF_t \times GD_t$	0.010***	0.016	0.011***	0.006	0.011***	0.002	0.025***
	(0.003)	(0.016)	(0.003)	(0.013)	(0.003)	(0.004)	(0.005)
N. Obs.	3,025,377	79,836	2,945,527	143,470	2,881,873	1,941,504	1,083,871
N. Firms	536,427	14,819	521,606	25,709	510,712	321,803	214,624
Firm FE	YES	YES	YES	YES	YES	YES	YES
Ctry-Yr FE	YES	YES	YES	YES	YES	YES	YES
Sample	All	Listed	Unlisted	Large	SME	Old	Young

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table A10: **Investment Cash Flow Sensitivities: Weighted Regressions**

This table reports the results of a set of regressions where the dependent variable is firm-level investment (I_t) and the explanatory variables are lagged investment (I_{t-1}), sales (S_t), cash flow (CF_t), and the interaction between CF_t and each of each of government debt over GDP (GD_t) and domestic credit to the private sector over GDP (DCP_t). All firm-level variables are scaled by total assets at the beginning of the period. The first column uses all firms in our sample, column 2 only includes listed firms, column 3 only includes unlisted firms, column 4 only includes large firms, column 5 only includes small and medium firms, column 6 only includes firms that are older than 10 years (at the beginning of the sample), and column 6 only includes firms that are younger than 10 years (at the beginning of the sample). Each observations is weighted by the inverse of the number of observations in each country-year. Weights smaller than 0.00001 are replaced with 0.00001. The regressions cover 69 countries for 2005-2014. The standard errors are clustered at the firm-level.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
I_{t-1}	-0.073***	-0.046***	-0.074***	-0.043***	-0.075***	-0.068***	-0.081***
	(0.001)	(0.004)	(0.001)	(0.003)	(0.001)	(0.001)	(0.001)
S_t	2.378***	3.788***	2.363***	3.007***	2.361***	2.456***	2.288***
	(0.013)	(0.132)	(0.013)	(0.075)	(0.013)	(0.018)	(0.020)
CF_t	10.975***	22.501***	11.519***	17.144***	11.414***	12.247***	8.964***
	(0.412)	(1.914)	(0.426)	(1.544)	(0.428)	(0.523)	(0.668)
$CF_t \times DCP_t$	-0.016***	-0.011	-0.026***	0.026**	-0.026***	-0.022***	-0.007
	(0.003)	(0.014)	(0.003)	(0.012)	(0.003)	(0.004)	(0.005)
$CF_t \times GD_t$	0.007**	0.009	0.008**	-0.006	0.008**	-0.002	0.021***
	(0.003)	(0.015)	(0.003)	(0.013)	(0.003)	(0.004)	(0.005)
N. Obs.	3,031,244	84,928	2,946,284	148,836	2,882,331	1,946,012	1,085,179
N. Firms	537,526	15,739	521,784	26,681	510,832	322,622	214,898
Firm FE	YES	YES	YES	YES	YES	YES	YES
Ctry-Yr FE	YES	YES	YES	YES	YES	YES	YES
Sample	All	Listed	Unlisted	Large	SME	Old	Young

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table A11: **Investment Cash Flow Sensitivities: Excluding France, Italy and Spain**

This table reports the results of a set of regressions where the dependent variable is firm-level investment (I_t) and the explanatory variables are lagged investment (I_{t-1}), sales (S_t), cash flow (CF_t), and the interaction between CF_t and each of government debt over GDP (GD_t) and domestic credit to the private sector over GDP (DCP_t). All firm-level variables are scaled by total assets at the beginning of the period. The first column uses all firms in our sample, but excluding France, Italy and Spain, column 2 only includes listed firms, column 3 only includes unlisted firms, column 4 only includes large firms, column 5 only includes small and medium firms, column 6 only includes firms that are older than 20 years (at the beginning of the sample), and column 6 only includes firms that are younger than 20 years (at the beginning of the sample). The regressions cover 66 countries for 2005-2014. The standard errors are clustered at the firm-level.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
I_{t-1}	-0.082***	-0.046***	-0.084***	-0.043***	-0.086***	-0.091***	-0.079***
	(0.001)	(0.004)	(0.001)	(0.004)	(0.001)	(0.002)	(0.001)
S_t	2.321***	3.794***	2.285***	3.049***	2.285***	2.531***	2.279***
	(0.021)	(0.133)	(0.021)	(0.088)	(0.022)	(0.048)	(0.024)
CF_t	10.533***	22.830***	11.788***	18.030***	11.663***	8.294***	10.780***
	(0.465)	(1.934)	(0.490)	(1.594)	(0.493)	(1.060)	(0.533)
$CF_t \times DCP_t$	-0.006	-0.013	-0.027***	0.022*	-0.026***	0.021**	-0.012**
	(0.004)	(0.014)	(0.004)	(0.012)	(0.004)	(0.009)	(0.005)
$CF_t \times GD_t$	0.029***	0.012	0.027***	0.001	0.027***	0.010	0.036***
	(0.005)	(0.016)	(0.005)	(0.014)	(0.005)	(0.008)	(0.006)
N. Obs.	1,076,558	83,271	993,255	120,230	956,251	275,593	800,910
N. Firms	204,464	15,365	189,096	21,956	182,495	50,243	154,215
Firm FE	YES	YES	YES	YES	YES	YES	YES
Ctry-Yr FE	YES	YES	YES	YES	YES	YES	YES
Sample	All	Listed	Unlisted	Large	SME	Old	Young

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table A12: **Firm-Level Regressions: Balanced Panel**

This table reports the results of a set of regressions where the dependent variable is firm-level investment (I_t) and the explanatory variables are lagged investment (I_{t-1}), sales (S_t), cash flow (CF_t), and the interaction between CF_t and each of government debt over GDP (GD_t) and domestic credit to the private sector over GDP (DCP_t). All firm-level variables are scaled by total assets at the beginning of the period. The first column uses all firms for which we have a balanced panel over 2007-13, column 2 only includes listed firms (same balanced panel), column 3 only includes unlisted firms (same balanced panel), column 4 only includes large firms (same balanced panel), column 5 only includes small and medium firms (same balanced panel), column 6 only includes firms that are older than 10 years (at the beginning of the sample, same balanced panel), and column 6 only includes firms that are younger than 10 years (at the beginning of the sample, same balanced panel). The regressions cover 67 countries over 2007-2013. The standard errors are clustered at the firm-level.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
I_{t-1}	-0.075***	-0.036***	-0.076***	-0.042***	-0.076***	-0.078***	-0.067***
	(0.001)	(0.007)	(0.001)	(0.005)	(0.001)	(0.001)	(0.002)
S_t	2.703***	4.340***	2.688***	3.332***	2.682***	2.846***	2.485***
	(0.018)	(0.195)	(0.018)	(0.098)	(0.018)	(0.023)	(0.030)
CF_t	10.517***	20.968***	11.145***	15.155***	11.062***	10.858***	10.059***
	(0.594)	(2.904)	(0.609)	(2.246)	(0.614)	(0.727)	(1.029)
$CF_t \times DCP_t$	-0.033***	0.009	-0.045***	0.040**	-0.046***	-0.038***	-0.024***
	(0.004)	(0.022)	(0.004)	(0.016)	(0.004)	(0.005)	(0.007)
$CF_t \times GD_t$	0.023***	-0.006	0.026***	-0.014	0.026***	0.022***	0.020***
	(0.004)	(0.027)	(0.004)	(0.020)	(0.004)	(0.005)	(0.008)
N. Obs.	1,760,460	35,850	1,724,574	77,430	1,682,988	1,260,180	500,214
N. Firms	293,410	5,975	287,429	12,905	280,498	210,030	83,369
Firm FE	YES	YES	YES	YES	YES	YES	YES
Ctry-Yr FE	YES	YES	YES	YES	YES	YES	YES
Sample	All	Listed	Unlisted	Large	SME	Old	Young

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1