

WP/15/77

IMF Working Paper

Investment in Emerging Markets
We Are Not in Kansas Anymore...Or Are We?

by Nicolás Magud and Sebastián Sosa

I N T E R N A T I O N A L M O N E T A R Y F U N D

IMF Working Paper

Western Hemisphere Department

Investment in Emerging Markets¹

We Are Not in Kansas Anymore...Or Are We?

Prepared by Nicolás Magud and Sebastián Sosa

Authorized for distribution by Hamid Faruqee

April 2015

IMF Working Papers describe research in progress by the author(s) and are published to elicit comments and to encourage debate. The views expressed in IMF Working Papers are those of the author(s) and do not necessarily represent the views of the IMF, its Executive Board, or IMF management.

Abstract

We document that (i) although private investment growth in emerging markets has decelerated in recent years, it came down from cyclical highs and remains close to pre-crisis trends; and (ii) investment-to-output ratios generally remain close to or above historical averages. We show that investment is positively related to expected future profitability, cash flows and debt flows, and negatively associated with leverage. Critically, it is also positively related to (country-specific) commodity export prices and capital inflows. Lower commodity export prices and expected profitability, a moderation in capital inflows, and increased leverage account for the bulk of the recent investment deceleration.

JEL Classification Numbers: E2, E3, F3, F4.

Keywords: Investment, emerging markets, financial constraints, commodity prices, capital inflows.

Author's E-Mail Address: NMagud@imf.org; SSosa@imf.org

¹ We are grateful to Sebnem Kalemli-Ozcan, Hamid Faruqee, Andre Meier, Gian Maria Milesi Ferretti, Bertrand Gruss, Herman Kamil, Alex Klemm, Samya Beidas-Strom, Hui Tong, Davide Furceri, and Sergejs Saksonovs for their valuable comments and suggestions. We are also thankful to Genevieve Lindow and Ben Sutton for their excellent research assistance, and to Maria Gutierrez for editorial assistance.

I. Introduction	4
II. Stylized facts: Recent Investment Dynamics in EMs	6
III. Econometric Approach	10
A. Empirical Model	10
B. Data	12
IV. Results.....	14
A. Baseline Results	14
B. Robustness.....	20
C. Explaining the Recent Investment Weakening	22
V. Concluding Remarks.....	24
References.....	29
Tables	
1. Summary Statistics.....	13
2. Baseline Results	15
3. Financial Constraint Relaxation and Recent Slowdown.....	16
4. Regional Decomposition.....	18
5. Firms’ Characteristics	19
6. Robustness: Arellano-Bond GMM specification.....	20
7. Robustness: Using Cash Stock.....	21
Figures	
1. Real Private Investment Growth, 2001–14.....	6
2. Real Private Investment, 1990–2014	7
3. Real Private Investment, 1980–2014	8
4. Real Private Investment and Commodity Export Price Growth, 2004–14.....	8
5. Selected Emerging and Developing Economies: WEO Real GDP Growth Projections	9
6. Real Private Investment and Net Capital Inflows, 2004–14.....	9
7. Distribution of Selected Variables	14
8. Contributions to the Recent Slowdown	23
Appendix.....	26

I. INTRODUCTION

Emerging market economies (EMs) exhibited strong investment growth in 2003–11, interrupted only temporarily in 2009 owing to the impact of the global financial crisis. After peaking in 2011, however, investment growth has waned in most of these economies. Furthermore, real output growth forecasts have been revised down significantly, to a large extent owing to the lower than projected actual investment.² But, what explains this weakness in investment? What is the role of external factors? Is the slowdown a generalized phenomenon across EMs? Moreover, can recent investment trends be explained by the standard determinants? How concerned should policy makers be about the recent investment disappointment?

We address these questions by first identifying and documenting key trends in private investment across EMs, putting the recent slowdown in historical perspective. Then, we study the determinants of investment in panel regressions that combine firm level data for about 16,000 listed firms with country-specific macroeconomic variables—particularly commodity export prices and capital inflows—for 38 EMs over the period 1990–2013. After identifying the key factors driving firms’ investment decisions in EMs, we shed light on which of these factors have been the main drivers of the recent investment weakness.

We document that although investment in EMs has weakened in the last few years, it came down from cyclical highs and remains broadly at pre-crisis levels. And although investment-to-output ratios have flattened or declined moderately, they remain close to or above historical averages for most EMs. The main results from the panel regressions can be summarized as follows:

- *The usual suspects:* EM firms’ capital expenditure is positively associated with expected profitability (proxied by Tobin’s Q), cash flows (suggesting the existence of borrowing constraints), and debt flows. It is negatively associated with leverage.
- *Commodities matter:* Investment is positively associated with changes in (country-specific) commodity export prices.
- *Foreign financing and relaxation of financial constraints:* Investment by EM firms is positively influenced by the availability of foreign (international) financing. Moreover, capital inflows help relax firms’ financial constraints, with the sensitivity of investment to cash flow weakening as capital inflows increase. This effect is particularly strong for non-tradable sector firms.

² See Box 1.2 in the October 2014 *World Economic Outlook* and Box 1 in the October 2014 *Regional Economic Outlook: Western Hemisphere*.

- *After the boom:* Firms' investment has not been abnormally weak in the past three years, at least not above and beyond what can be explained by the evolution of its main determinants mentioned above.
- *Who to blame?* The sharp decline in commodity export prices (especially in Latin America and the Caribbean, LAC) and the lower expected profitability of firms (which partly reflects the downward revisions to potential growth in many EMs) have been important factors behind the recent deceleration of investment. A moderation in capital inflows to EMs and increased leverage (particularly in Asia) have also played a significant role.

Why does this matter? Examining the determinants of private investment is important to understand business cycle fluctuations in EMs. But the topic is also relevant because capital accumulation is a key driver of potential output growth. The latter is of particular interest at the current juncture given that most EMs have been experiencing significant downward revisions to potential growth. Moreover, identifying the main drivers of the recent slowdown in investment is relevant for policy makers in EMs to the extent that it helps assessing the likely effectiveness of alternative policy measures to foster private investment and boost potential growth.

Our paper is related to the extensive empirical literature on the determinants of corporate investment in EMs. In particular, it relates to a strand that studies financing constraints, typically relying on Tobin's Q investment models or Euler investment equations. Most of these studies have documented the importance of internal financing for firms' investment owing to capital markets imperfections. Based on this framework, for example, Fazzari and others 1988 examine the case of U.S. manufacturing firms, while Love and Zicchino 2006 study emerging market companies.³ The sensitivity of investment to cash flows is particularly strong for smaller firms (Fazzari and others, 2000, and Carpenter and Guariglia, 2008) and for firms in less financially developed economies (Love, 2003). Criticism of using of cash flow as a measure of financial frictions (e.g., Kaplan and Zingales, 1997, Gomes, 2001, and Abel and Eberly, 2011) have been addressed by Gilchrist and Himmelberg (1995, 1999), who establish the existence of financial constraints by testing the significance of investment-cash flow sensitivities beyond the effect of the "Fundamental Q."

The study most closely linked to ours is Harrison and others 2004, which documents that foreign direct investment (FDI) flows to emerging markets are associated with a reduction in firms' financing constraints. Like us, they examine whether—and to what extent—the availability of foreign capital helps relaxing financing constraints in EM firms by combining firm-level data on cash flows with country-specific capital flows. Forbes 2007 and Gelos and Werner 2002 also find that the latter relax when capital account restrictions are eased.

³ Hubbard (1998) provides a thorough survey of this literature.

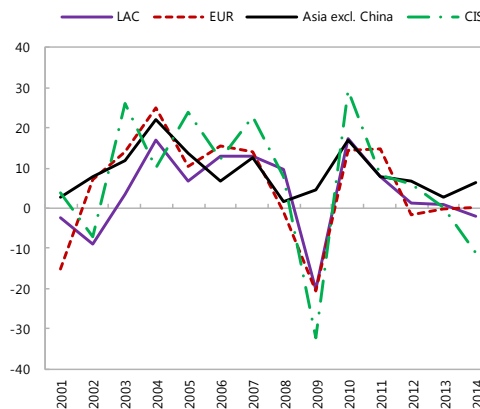
We contribute to this literature in several ways. First, and in contrast with previous studies on investment in EMs using firm-level data—which mostly focused on one country or a small group of countries—we analyze the determinants of firms’ investment decisions for a large sample of EMs covering a period of over two decades. This allows us not only to work with an extensive database, but also to explore (and exploit) the potential heterogeneity across EM regions. Second, in addition to firm level data we include some additional (country-specific) macroeconomic variables into the analysis (in particular commodity export prices). Finally, we use an updated database to examine the drivers of the recent investment slowdown.

The rest of the paper proceeds as follows. The next section documents key stylized facts on investment trends, comparing across EM regions and putting the recent deceleration in historical perspective. Section III describes the empirical approach, and section IV presents the results. Finally, Section V concludes and discusses some policy implications.

II. STYLIZED FACTS: RECENT INVESTMENT DYNAMICS IN EMs

Real private investment exhibited strong growth in EMs in the period 2003–11, except in 2009, when the global financial crisis hit. After peaking in 2011, however, investment growth has gradually slowed (Figure 1). Most EM regions have shared a similar pattern of investment dynamics, with strong growth in the pre-crisis period, a sharp contraction in 2009 followed by a rapid and strong recovery, and a sustained deceleration in the last three years. The latter was particularly pronounced in emerging Europe, where growth has stalled since 2012, and Commonwealth of Independent States (CIS) economies, where it actually turned negative in 2014.

Figure 1. Real Private Investment Growth, 2001–14
(In percent)

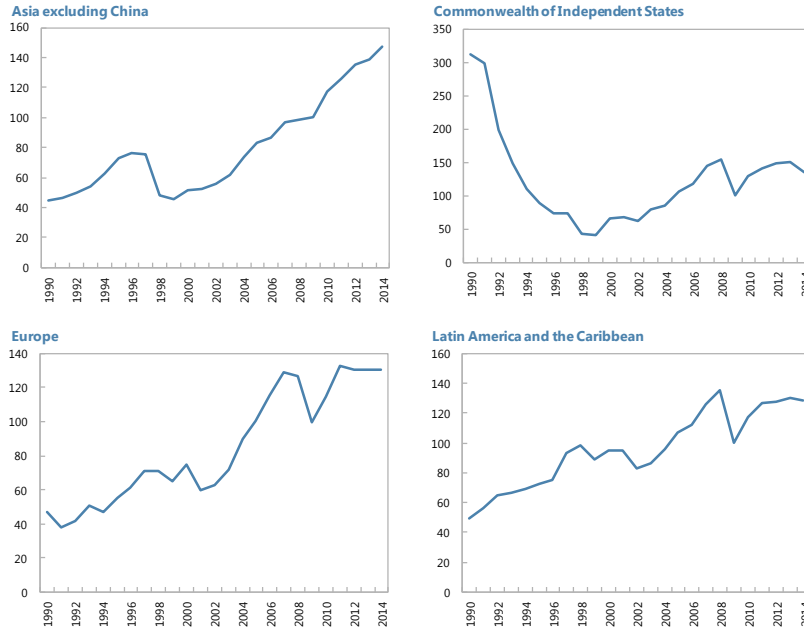


Sources: IMF, *World Economic Outlook*; and authors' calculations.
¹ PPP-weighted average.

In contrast to several advanced economies (AEs), however, the slowdown in EMs has not resulted in a collapse of private investment. For most of these economies, private investment has moderated from cyclical highs after a period of robust growth, with investment levels still around or above pre-crisis levels (Figure 2). Some of the CIS economies are exceptions,

with private investment slumps observed recently, for instance, in Ukraine and Russia owing to idiosyncratic factors.

Figure 2. Real Private Investment, 1990–2014¹
(Index: 2010=100)



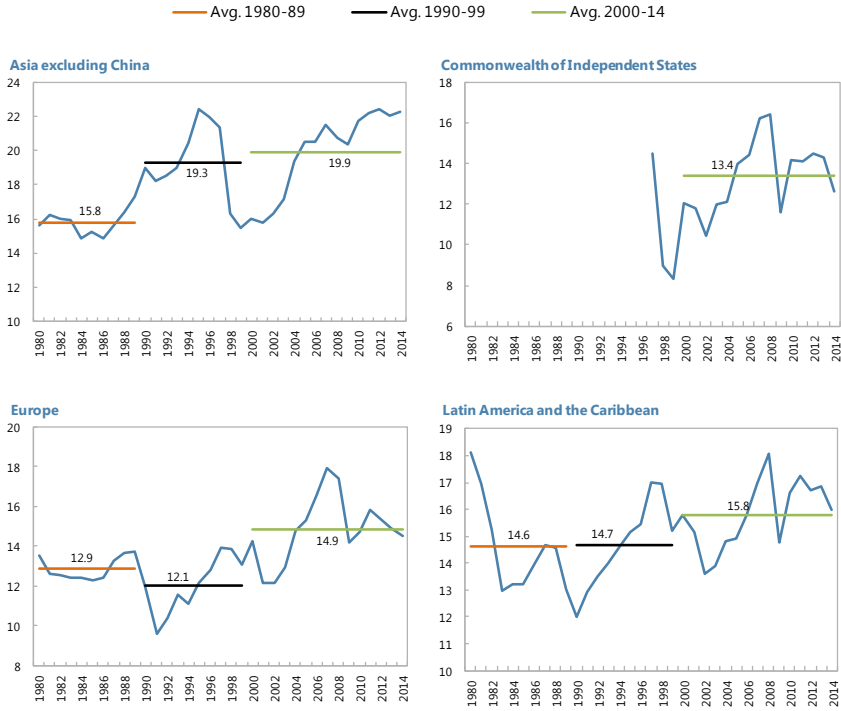
Sources: IMF, *World Economic Outlook*; and authors' calculations.

¹ PPP-weighted average.

The dynamics of investment-to-output ratios tell a similar story. Private investment-to-output ratios have flattened or declined moderately, but generally remain close to or above historical averages (Figure 3). Emerging Asia (excluding China) appears to be the region with the most resilient private investment behavior, with ratios to GDP persisting above pre-crisis levels despite some flattening over the last two years. In the other regions, by contrast, investment-to-GDP ratios have declined and are below pre-crisis levels. Still, in Latin America and Europe they remain above the average of the last three decades.

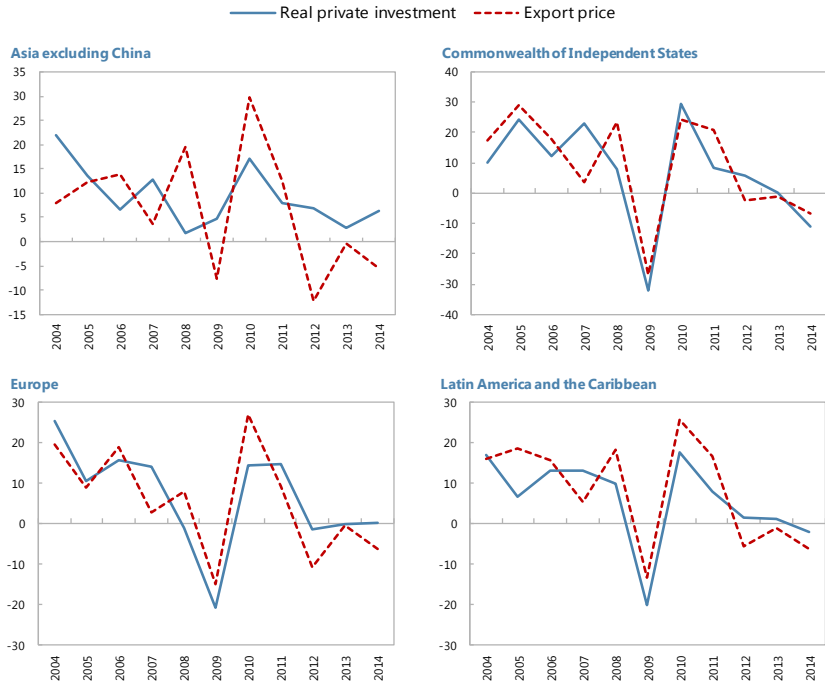
Recent trends in EM private investment have been highly correlated with those of (gross) commodity export prices (Figure 4). The co-movement of private investment and (country-specific) commodity export prices is especially high in the case of LAC and CIS (with correlation coefficients of 0.84), reflecting the fact that these regions include many of the largest net commodity exporters. For emerging Europe the correlation is also strong (0.82), while it is much lower for emerging Asia excluding China (0.36).

Figure 3. Real Private Investment, 1980–2014
(In percent of real GDP)



Sources: IMF, *World Economic Outlook*; and authors' calculations.
¹ PPP-weighted average per region. Simple average per decade.

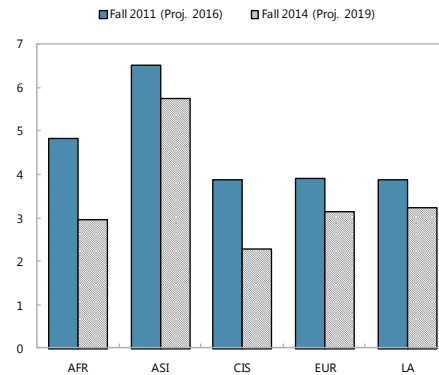
Figure 4. Real Private Investment and Commodity Export Price Growth, 2004–14
(In percent)



Sources: IMF, *World Economic Outlook*; Gruss (2014); and authors' calculations.
¹ PPP-weighted average.

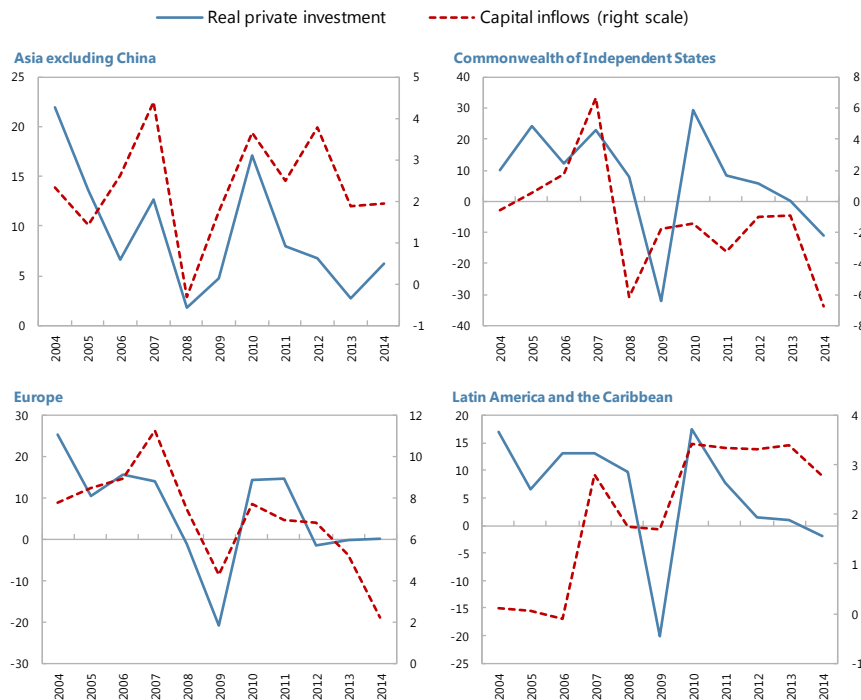
Moreover, for commodity exporters, the sharp decline in commodity export prices reinforced a general sense of leaner times for EMs—associated with generalized downward revisions to potential growth, presumably causing firms to curtail their capital spending (Figure 5). Finally, private investment in EMs has also been correlated with capital inflows (Figure 6).

**Figure 5. Selected Emerging and Developing Economies:
WEO Real GDP Growth Projections
(In percent)**



Sources: IMF, *World Economic Outlook*; and authors' calculations.
Note: AFR=Africa; ASI=Asia; CIS=Commonwealth of Independent States; EUR=Europe; and LA=Latin America.

**Figure 6. Real Private Investment and Net Capital Inflows, 2004–14
(In percent change, and in percent of GDP)**



Sources: IMF, *World Economic Outlook*; and authors' calculations.
¹ PPP-weighted average. Capital inflows defined as the balance of the external financial account, in percent of GDP.

III. ECONOMETRIC APPROACH

We estimate a panel regression model of investment with time and firm fixed effects, combining firm-level data and country-specific macroeconomic variables to identify the main determinants of corporate investment in EMs. The analysis focuses on factors that, for theoretical reasons, are thought to affect firms' investment decisions. These factors include firm-specific variables such as expected future profitability, cash flows, cost of debt, leverage, and debt flows, as well as country-specific macroeconomic variables such as commodity export prices, net capital inflows, and uncertainty. We pay particular attention to the recent period, characterized by a deceleration of investment growth in EMs, and try to identify the key factors explaining the slowdown.

A. Empirical Model

Our empirical model is a variation of the traditional Tobin's Q investment model, augmented to include other possible determinants identified in the literature of corporate investment. In a neoclassical model, the marginal benefit from an extra unit of investment and the cost of capital should be sufficient statistics to explain investment behavior. The Q-theory of investment (Tobin, 1969; Hayashi, 1982) basically reformulates the neoclassical theory, such that firms' investment decisions are based on the ratio between the market value of the firm's capital stock and its replacement cost.⁴ Much of the literature on corporate investment during the last decades, however, has highlighted the importance of financing constraints. In the presence of financial frictions, access to external financing for investment projects that would in principle be profitable may be limited. Therefore, firms' investment decisions would be determined not only by investment opportunities, but also by the availability of internal funds.

Evidence of financial constraints has been based on the sensitivity of investment to different measures of internal funds—typically cash flow or cash stock. The idea behind it is that the tighter the firms' financial constraints, the higher the dependence on internal funding.⁵ However, the interpretation of the correlation between cash flow and investment as evidence of financial constraints is far from uncontroversial. A strand of the literature has argued that rather than financing constraints, the relationship between cash flows and investment may reflect the correlation between cash flow and investment opportunities that are not well-captured by traditional measures of investment opportunities, in particular Tobin's Q. A number of studies (e.g., Gilchrist and Himmelberg, 1995 and 1999; and Carpenter and Guariglia, 2008), however, have addressed these criticisms, and most empirical studies have

⁴ For instance, investment would increase whenever the value of Q is larger than one, as it would reflect that the present discounted value of the flow of expected dividends outweighs the replacement cost of capital.

⁵ See, for example, Fazzari and others 1988, Blanchard and others 1994, and Fazzari and others 2000.

continued to use the investment-cash flow sensitivity as a measure of financial frictions. We also follow this approach, using both cash flow measures and Tobin's Q .

We also include corporate financial indicators as well as key country-specific macroeconomic variables that may affect corporate investment. We estimate linear panel regressions allowing for both time and firm fixed effects.⁶ Given that our specification contains both firm-level and country-level data, we use clustered (by country) robust standard errors to address the risk of having biased standard errors. Thus, the baseline specification is as follows:

$$\frac{I_{ic,t}}{K_{ic,t-1}} = \alpha + \beta_1 Q_{ic,t} + \beta_2 \frac{CF_{ic,t}}{K_{ic,t-1}} + \beta_3 Lev_{ic,t-1} + \beta_4 \frac{\Delta Debt_{ic,t}}{K_{ic,t-1}} + \beta_5 Int_{ic,t} + \beta_6 P_{c,t-1}^x + \beta_7 KI_{c,t} + \beta_8 Unc_{c,t} + d_i + d_t + \varepsilon_{ic,t} \quad (1)$$

where subscripts (ic,t) stand for firm i in country c during period t . I is fixed investment (excluding inventories) and K the stock of capital. Q represents the standard Tobin's Q , where average Q , measured as the price-to-book value of the firm, is used as a proxy for (unobservable) marginal Q .⁷ CF denotes the firm's cash flow; Lev is leverage; $\Delta Debt$ stands for the change in total debt since the previous period; and Int is a measure of the firm's cost of capital, to account for the opportunity cost of funds. KI denotes (net) capital inflows; P^x denotes (the log difference of) the commodity export price index; and Unc stands for aggregate uncertainty. d_i, d_t stand for firm- and trend- (or alternatively time-, see discussion below) fixed effects. Finally, ε represents the error term.

Intuitively, this specification is based on the idea that investment is determined by the flow of (discounted) future dividends. We expect a positive coefficient associated to Q , indicating that firms that expect to be more profitable should invest more, a common finding in the literature. As discussed above, the cash flow coefficient should exhibit a positive sign if firms face financial constraints, as firms would need to rely on internal funds to finance investment projects. Debt stock and debt flows, in turn, are expected to have opposite effects on corporate investment. While higher leverage is expected to be negatively associated with investment, the flow of debt would be positively related to capital expenditure because financing investment is one of the main reasons to incur new debt. A higher cost of debt, in turn, is expected to be associated with lower investment. Regarding the country-level variables, commodity export prices are expected to be positively related to capital spending in the net commodity exporters of our sample. Net capital inflows should also have a positive effect on investment, including owing to the fact that they may play a role in relaxing financing constraints in EMs. Finally, economic theory would predict that higher uncertainty

⁶ As discussed later, the results are robust to also allowing for country fixed effects.

⁷ See Hayashi 1982 for a discussion of under what conditions both measures are equivalent.

should be associated with lower investment; for instance, because an increase in uncertainty would dampen capital spending immediately, as firms enter a “wait and see” mode, especially to the extent that investment decisions are irreversible.⁸

We also examine a number of extensions to the baseline investment equation. First, to assess whether capital inflows—proxy for external financial conditions—help relax financial constraints for domestic firms, we interact the capital inflow variable with cash flows (Equation 2):

$$\begin{aligned} \frac{I_{ic,t}}{K_{ic,t-1}} = & \alpha + \beta_1 Q_{ic,t} + \beta_2 \frac{CF_{ic,t}}{K_{ic,t-1}} + \beta_3 Lev_{ic,t-1} + \beta_4 \frac{\Delta Debt_{ic,t}}{K_{ic,t-1}} + \beta_5 Int_{ic,t-1} + \beta_6 P_{c,t-1}^x \\ & + \beta_7 KI_{c,t} + \omega \frac{CF_{ic,t}}{K_{ic,t-1}} * KI_{c,t} + \beta_8 Unc_{c,t} + d_i + d_t + \varepsilon_{ic,t} \end{aligned} \quad (2)$$

We also focus on the most recent (post-2011) period with the aim of understanding the investment weakening observed across EMs. Thus, we add to the equation a dummy variable (*RECENT*) that takes the value of one for all observations during this period. Here, we control for time effects through a time trend rather than year dummies (to mitigate multicollinearity problems).⁹ Next, we add additional terms, to interact the *RECENT* dummy with the main factors determining investment in order to assess whether the marginal effect of any of the latter changed in recent years. Specifically, we estimate the following specification:

$$\begin{aligned} \frac{I_{ic,t}}{K_{ic,t-1}} = & \alpha + \beta_1 Q_{ic,t} + \beta_2 \frac{CF_{ic,t}}{K_{ic,t-1}} + \beta_3 Lev_{ic,t-1} + \beta_4 \frac{\Delta Debt_{ic,t}}{K_{ic,t-1}} + \beta_5 Int_{ic,t-1} + \beta_6 P_{c,t-1}^x + \beta_7 KI_{c,t} \\ & + \delta RECENT + \eta_h RECENT * X_t^h + d_i + d_t + \varepsilon_{ic,t} \end{aligned} \quad (3)$$

For $X_t^h = \left\{ \frac{CF_{ic,t}}{K_{ic,t-1}}, Lev_{ic,t-1}, \frac{\Delta Debt_{ic,t}}{K_{ic,t-1}}, P_{c,t-1}^x, KI_{c,t} \right\}$, respectively.

B. Data

We use firm-level data from Worldscope. The frequency of the data is annual, for a sample of 16,000 publicly traded firms from 38 EMs covering the period 1990—2013. Table A.1 in the Appendix presents the list of countries in the sample and the number of firms per

⁸ See, for instance, Bloom and others 2001, Magud 2008, Baum and others 2008, and Dixit and Pindyck 1995.

⁹ Analysis of time effects through year dummies point to a clear downward trend, which justifies the use of a time trend in the regression.

country.¹⁰ The number of firms varies significantly across countries as well as across time, with a smaller number in most countries during the first half of the 1990s.¹¹

Firm-level data. Investment (I) is measured as the purchase of fixed assets by the firm. The stock of capital (K) is measured as the total net value of property, plant, and equipment. Tobin's Q is given by average Q . Cash flow (CF) is computed as the firm's net profits from operating activities; leverage (Lev) is measured as the ratio of total debt obligations to total assets; new debt ($\Delta Debt$) is defined as the change in total debt obligations from the previous period; and the cost of funds (Int) is defined as the firm's effective interest rate paid on total debt obligations. In some extensions we also use firms' total assets, the share of internationally owned assets in total assets, gross income, and the stock of cash.

To avoid the presence of outliers and coding errors that would bias the estimation, observations with non-consistent data are dropped from the sample.¹² Then, the country-specific distribution for each of the variables is calculated and the bottom and top 5 percent of each variable's observations are excluded from the analysis. Table 1 reports the summary statistics for the firm-level data.¹³

Table 1. Summary Statistics

Variable	Observations	Mean	Std. Dev.
Investment/capital stock(t-1)	389977	0.25	1.46
Q	435454	1.81	1.59
Cash flow/capital stock(t-1)	410693	0.06	4.67
Leverage	493919	0.68	1.05
Interest expense ratio	355256	0.08	0.08
Change in debt/capital stock(t-1)	357397	0.27	6.69
Commodity export price growth	367748	4.32	13.18
Capital inflows/GDP	497058	-0.49	5.39

Source: Authors' calculations.

Figure 7 illustrates the variation of the main firm-level data across regions, particularly between emerging Asia and Latin America. Firms in emerging Asia tend to exhibit higher investment ratios than Latin American ones. Tobin's Q and leverage appear to be broadly similar across regions, but the cost of debt is typically higher for Latin American firms.

¹⁰ We consider countries that were classified as emerging markets at the start of the sample.

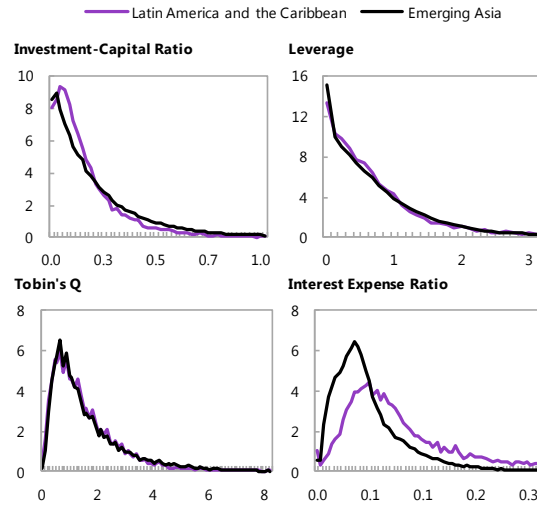
¹¹ The share of total private investment accounted for by corporate investment ranges, for example, between 70 and 75 percent across countries in LAC (although disaggregated data for many countries is not available). Moreover, the recent downturn has been mainly driven by corporate investment (although residential investment has also been trending downwards in some countries). The firm-level data in the sample represents about 12 percent of (national accounts) aggregate private investment, with correlation coefficients varying by country but averaging over 30 percent.

¹² For example, negative book values for the capital stock, debt, or the price-to-book value of equity.

¹³ Using listed firms only restricts the sample of firms, imposing some limitations to the data.

Macro-level data. We use the (country-specific) gross commodity export price indices constructed by Gruss (2014). Capital inflows (measured using the financial account balance, in percent of GDP) and real GDP series come from the IMF's *International Financial Statistics* and the *World Economic Outlook*. Finally, we use data from Bloomberg to construct our measure of country-specific uncertainty based on the (average monthly) volatility of stock market returns.

Figure 7. Distribution of Selected Variables
(In percent)



Source: IMF staff calculations.

Source: Authors' calculations.

Note: LAC=Latin America and the Caribbean; EA=emerging Asia.

IV. RESULTS

A. Baseline Results

Table 2 reports the results of the baseline specification (Equation 1). Column 1 shows that all the coefficients for the firm-level variables have the expected sign and are statistically significant at the one percent level (except for the cost of debt, which is significant only at the 10 percent level). Consistent with theory and the findings in previous empirical studies, Tobin's Q is positively related to investment. Also in line with previous studies, we find robust evidence of financial constraints, reflected in a positive relationship between firm's cash flow and capital spending. Moreover, more leveraged firms tend to exhibit lower investment in the following period, while an increase in debt is associated with higher capital expenditure. Finally, the coefficient on the cost of debt is negative, as expected.

The estimated coefficients are not only statistically but also economically significant in most cases. A one-standard-deviation change in each of the main independent variables would be associated with a change in the investment-to-capital ratio by the following amounts

(in percentage points): Tobin's Q: 2.9, cash flow: 5.3, leverage: 3.3, change in debt: 1.9, commodity export growth: 0.63, and capital inflows: 1.4, respectively. As indicated in Table 1, the investment-to-capital ratio has a mean of 0.25, and a standard deviation of 1.46.

Table 2. Baseline Results¹

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	ICR	ICR	ICR	ICR	ICR	ICR
Q	0.0231*** (0.00514)	0.0226*** (0.00510)	0.0200*** (0.00508)	0.0188*** (0.00490)	0.0184*** (0.00465)	0.0179*** (0.00465)
Cash flow		0.00406** (0.00161)	0.0118*** (0.00208)	0.0114*** (0.00221)	0.0114*** (0.00219)	0.0112*** (0.00212)
Leverage (t-1)			-0.0340*** (0.00345)	-0.0323*** (0.00292)	-0.0315*** (0.00305)	-0.0318*** (0.00315)
Interest expense ratio (t-1)			-0.0448* (0.0261)	-0.0415 (0.0274)	-0.0394 (0.0281)	-0.0421 (0.0281)
Change in debt			0.00334*** (0.000911)	0.00296*** (0.00100)	0.00292*** (0.00101)	0.00291*** (0.00101)
Commodity export price (t-1)				0.000445*** (0.000105)	0.000475*** (9.97e-05)	0.000461*** (0.000101)
Net capital inflows					0.00255*** (0.000680)	0.00260*** (0.000709)
Uncertainty						3.80e-06 (3.32e-06)
Constant	11.75*** (0.953)	11.77*** (0.942)	10.94*** (1.010)	10.28*** (0.806)	10.04*** (0.863)	9.832*** (1.013)
Observations	121,047	121,006	83,921	64,276	64,276	63,460
Number of firms	18,624	18,621	15,165	12,317	12,317	12,280
Number of countries	38	38	38	36	36	36
R ²	0.0203	0.0239	0.0352	0.0345	0.0414	0.0416

Source: Authors' calculations.

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

¹ Robust standard errors (clustered by country), and controlling for time effects and firm-level fixed effects.

In light of the satisfactory benchmark results using firm-level explanatory variables, we introduce our country-specific macro variables (Table 2, columns 4–6). The magnitude and significance of the coefficients of Tobin's Q, cash flow, leverage, and change in debt do not change. The coefficient on the cost of debt, while still negative and similar in magnitude, turns statistically insignificant.¹⁴ We find robust evidence that an increase in a country's commodity export prices is associated with higher investment in firms in that country. This result is consistent with previous studies that have documented the positive impact of improving terms of trade on investment even beyond firms in the export sector (e.g., Fornero and others 2014 for Chile and Ross and Tashu 2015 for Peru). It also consistent with Fernandez and others (2014), who document that, on average, EMs are commodity exporters and that country-specific commodity prices are pro-cyclical. The impact of commodity export prices could be transmitted through direct channels affecting commodity sectors (and other sectors, such as manufacturing and services, related to commodities), or indirectly through income effects affecting aggregate demand and activity in other sectors as well.

¹⁴ Thus, we exclude this variable from subsequent extensions to the baseline specification.

Investment in EM firms is also influenced by the availability of foreign (cross-border) financing. The larger the net capital flows an EM economy receives, the larger its firms' capital expenditure. Both coefficients (on commodity export prices and capital inflows) are positive and strongly statistically significant. Interestingly, we do not find market uncertainty to be a significant determinant of capital expenditure at the firm level. This result is consistent with previous studies (e.g., Leahy and Whited, 1996) showing that although uncertainty has a negative effect on investment, the effect generally disappears when Tobin's Q is introduced.

Table 3 reports the results of some of the extensions to the baseline specification (Equations 2 and 3 above). Column 1 shows that the interaction term between cash flow and net capital inflows is negative and significant, which implies that the larger the capital inflows to an economy, the lower the sensitivity of investment to cash flow. This suggests that more favorable external financial conditions proxied by capital inflows help to relax domestic financing constraints, as firms become less dependent on internal funds to finance

investment projects. That is, $\frac{\partial I/K}{\partial CF} = \beta_2 + \omega * KI$, with $\omega < 0$. This result is consistent with theoretical arguments and empirical findings in the literature (see for instance, Harrison and others, 2004).

Table 3. Financial Constraint Relaxation and Recent Slowdown¹

VARIABLES	(1) ICR	(2) ICR	(3) ICR	(4) ICR	(5) ICR	(6) ICR	(7) ICR
Q	0.0192*** (0.00445)	0.0191*** (0.00451)	0.0191*** (0.00445)	0.0191*** (0.00445)	0.0191*** (0.00447)	0.0187*** (0.00462)	0.0191*** (0.00447)
Cash flow	0.00609*** (0.00136)	0.00608*** (0.00136)	0.00623** (0.00230)	0.00584** (0.00216)	0.00585** (0.00216)	0.00584** (0.00216)	0.00588** (0.00216)
Leverage (t-1)	-0.0308*** (0.00311)	-0.0307*** (0.00312)	-0.0308*** (0.00311)	-0.0308*** (0.00309)	-0.0304*** (0.00312)	-0.0309*** (0.00310)	-0.0305*** (0.00319)
Change in debt	0.00276*** (0.000930)	0.00276*** (0.000930)	0.00279*** (0.000928)	0.00277*** (0.000931)	0.00277*** (0.000926)	0.00277*** (0.000930)	0.00306*** (0.000821)
Commodity export price (t-1)	0.000449*** (9.89e-05)	0.000420*** (8.95e-05)	0.000416*** (8.89e-05)	0.000404*** (8.26e-05)	0.000396*** (9.32e-05)	0.000418*** (8.87e-05)	0.000416*** (8.88e-05)
Net capital inflows	0.00266*** (0.000727)	0.00273*** (0.000753)	0.00253*** (0.000706)	0.00252*** (0.000708)	0.00252*** (0.000706)	0.00250*** (0.000694)	0.00253*** (0.000710)
Cash flow x net capital inflows	-0.000671*** (0.000220)	-0.000671*** (0.000220)					
Recent		-0.00503 (0.00513)	-0.00441 (0.00493)	-0.00437 (0.00536)	-0.00378 (0.00517)	-0.00942 (0.00685)	-0.00459 (0.00505)
Recent x cashflow			-0.00230 (0.00248)				
Recent x commodity export price (t-1)				0.000174 (0.000488)			
Recent x leverage (t-1)					-0.00536** (0.00257)		
Recent x Q						0.00303 (0.00229)	
Recent x change in debt							-0.00160 (0.000973)
Constant	9.456*** (0.885)	8.935*** (0.933)	8.874*** (0.927)	8.829*** (0.880)	8.790*** (0.912)	8.912*** (0.935)	8.871*** (0.928)
Observations	72,184	72,184	72,184	72,184	72,184	72,184	72,184
Number of firms	13,444	13,444	13,444	13,444	13,444	13,444	13,444
Number of countries	36	36	36	36	36	36	36
R ²	0.0377	0.0378	0.0366	0.0365	0.0366	0.0368	0.0367

Source: Authors' calculations.

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

¹ Robust standard errors (clustered by country), and controlling for time effects and firm-level fixed effects.

Columns 2–7 in Table 3 present the results of the specifications focusing on the recent slowdown (Equation 3). The dummy *RECENT* (equal to one in post-2011 years) is statistically insignificant (column 2). Thus, we find no evidence that firms' capital expenditure was particularly weak during these years, at least not beyond what can be explained by its main determinants. Moreover, the coefficients on the interaction terms between the *RECENT* dummy and each of the explanatory variables are also statistically insignificant (columns 3–7), suggesting that the effect of the main determinants of business investment has remained stable—particularly, it has not changed in the most recent period. Leverage is an exception, however, with a negative and statistically significant coefficient on the interaction term, implying that the sensitivity of investment to leverage has been higher after 2011 (column 5).

Regarding the stability of the coefficients in the recent period, we find some heterogeneity across EM regions (Tables A.2–A.4 in the Appendix). For instance, financing constraints have become tighter in post-2011 years in LAC (column 1 in Table A.2.); the positive relationship between commodity export prices and investment has become stronger in LAC and weaker in Asia (columns 5 and 6 in Table A.2); the impact of leverage on investment has become larger (i.e., more negative) in emerging Asia (column 2 in Table A.3) and that of new debt stronger in LAC (column 1 in Table A.4).

Table 4 reports the results of splitting the sample by regions. The results on most of the main explanatory variables hold for most regions. In LAC, although the coefficients on cash flow, change in debt, and capital inflows are positive, they are statistically insignificant (column 2). However, as discussed in the robustness section below, when using the Arellano-Bond approach in a Generalized Method of Moments (GMM) with robust standard errors specification, only the change in debt remains insignificant.¹⁵ However, as discussed earlier, for this region the coefficients on both cash flow and new debt turn significant (and positive) in the most recent period.

The results on the dummy '*RECENT*' by region are in line with those for the entire sample. As discussed above, the inclusion of this dummy is meant to examine whether investment has been abnormally weak in recent years, above and beyond what can be explained by the main determinant factors. We observe that for most regions the coefficient on this dummy is not statistically significant (the region "Other," including mainly African and Middle East economies, being an exception). This result suggests that the recent investment slowdown is generally in line with the behavior of the main determinants factors across regions.

¹⁵ The robustness section below presents the baseline specification using GMM estimation. The other tables using GMM are available upon request, with the results of the OLS specification holding throughout.

Table 4. Regional Decomposition¹

	Full sample	LAC	Asia	Europe	Other
VARIABLES	(1)	(2)	(3)	(4)	(5)
	ICR	ICR	ICR	ICR	ICR
Q	0.0191*** (0.00446)	0.0181*** (0.00362)	0.0177** (0.00545)	0.0197*** (0.00525)	0.0289*** (0.00332)
Cash flow	0.00584** (0.00216)	0.00659 (0.00648)	0.0125*** (0.00384)	0.000601 (0.00119)	0.00377 (0.00228)
Leverage (t-1)	-0.0308*** (0.00310)	-0.0337** (0.0132)	-0.0326*** (0.00365)	-0.0161* (0.00745)	-0.0236* (0.0112)
Change in debt	0.00277*** (0.000930)	0.00113 (0.00113)	0.00264* (0.00126)	0.00163 (0.00147)	0.00830*** (0.00149)
Net capital inflows	0.00252*** (0.000706)	0.00189 (0.00172)	0.00263** (0.000921)	0.00290* (0.00145)	0.00158* (0.000709)
Commodity export price (t-1)	0.000416*** (8.89e-05)	0.000467** (0.000175)	0.000469*** (0.000114)	0.000497*** (9.49e-05)	-0.000225 (0.000355)
Recent	-0.00511 (0.00500)	0.00511 (0.0188)	-0.000918 (0.00608)	0.000395 (0.00974)	-0.0483** (0.0123)
Constant	8.874*** (0.928)	4.058 (2.147)	10.02*** (0.870)	11.89* (6.525)	5.307 (2.920)
Observations	72,184	5,532	53,436	7,740	5,476
Number of firms	13,444	884	9,534	1,897	1,129
Number of countries	36	7	10	13	6
R ²	0.0366	0.0189	0.0434	0.0347	0.0646

Source: Authors' calculations.

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

¹ Robust standard errors (clustered by country), and controlling for time effects and firm-level fixed effects.

Table 5 explores how different characteristics of the firm affect its investment decisions. First, we look into the role of the size of the firm, proxied by the value of assets and by gross income, alternatively. In either case, we observe that larger firms tend to have higher investment ratios on average (columns 1 and 3). Columns 2 and 4 show that larger firms, on average, face weaker financial constraints, as evidenced by a negative and statistically significant coefficient on the interaction of assets and cash flow. In other words, the need for generating internal revenue to invest is smaller for larger firms.

Another characteristic of the firm that could, in principle, be relevant is the degree of financial integration with international markets. To measure the latter, we use the share of foreign assets holdings.¹⁶ A larger share of foreign asset holdings, all else equal, is associated with higher investment by the firm (column 5 in Table 6). These firms also exhibit weaker financial constraints than those with a smaller degree of international financial integration, as indicated by a negative (and statistically significant) coefficient on the interaction term between this variable and cash flow (column 6).

Column 7 delves into another characteristic of firms, namely the sector of activity. Specifically, we explore whether the extent of relaxation of financial constraints driven by capital inflows is different for firms in the non tradable sector compared to the tradable sector.¹⁷ We find that the relaxation of financing constraints associated with higher capital

¹⁶ Including this variable reduces the sample of firms by almost half, owing to data limitations.

¹⁷ See Table A.5 in the Appendix for a classification of firms in tradable and non-tradable sectors.

inflows is stronger for firms in the non-tradable sector, as illustrated by the coefficient on the triple interaction term in column 7.¹⁸

Table 5. Firms' Characteristics¹

VARIABLES	(1) ICR	(2) ICR	(3) ICR	(4) ICR	(5) ICR	(6) ICR	(7) ICR
Q	0.0191*** (0.00435)	0.0187*** (0.00431)	0.0183*** (0.00426)	0.0181*** (0.00424)	0.0236*** (0.00276)	0.0234*** (0.00275)	0.0191*** (0.00446)
Cash flow	0.00394** (0.00189)	0.0113*** (0.00309)	-0.00210 (0.00471)	0.00137 (0.00485)	0.0146*** (0.00214)	0.0162*** (0.00270)	0.00756 (0.00523)
Leverage (t-1)	-0.0313*** (0.00312)	-0.0315*** (0.00316)	-0.0465*** (0.00405)	-0.0463*** (0.00402)	-0.0269*** (0.00644)	-0.0268*** (0.00641)	-0.0306*** (0.00305)
Change in debt	0.00254*** (0.000903)	0.00218** (0.000893)	0.00534*** (0.00162)	0.00531*** (0.00160)	0.00350*** (0.00117)	0.00344*** (0.00118)	0.00275*** (0.000932)
Net capital inflows	0.00243*** (0.000670)	0.00239*** (0.000658)	0.00233*** (0.000684)	0.00232*** (0.000682)	0.00222*** (0.000798)	0.00221*** (0.000796)	0.00210** (0.000975)
Commodity export price (t-1)	0.000441*** (9.69e-05)	0.000446*** (9.74e-05)	0.000499*** (9.31e-05)	0.000499*** (9.29e-05)	0.000621*** (0.000153)	0.000621*** (0.000153)	0.000451*** (9.78e-05)
Size 1: Assets	0.000437*** (0.000154)	0.000641*** (0.000177)					
Assets x cash flow		-1.29e-05*** (4.03e-06)					
Size 2: Gross income			0.00976** (0.00460)	0.0102** (0.00482)			
Gross income x cash flow				-5.63e-05* (2.85e-05)			
Share of foreign assets holdings					0.647*** (0.124)	1.254*** (0.179)	
Share of foreign assets holdings x cash flow						-0.0358*** (0.00460)	
Non-tradables x cash flow							-0.00109 (0.00505)
Non-tradables x net capital inflows							0.000930 (0.000828)
Cash flow x financial account balance							-1.47e-05 (0.000252)
Non-tradables x net capital inflows x cash flow							-0.00101*** (0.000235)
Constant	9.870*** (0.954)	10.12*** (0.967)	9.206*** (1.084)	9.255*** (1.088)	7.636*** (0.929)	7.665*** (0.913)	9.458*** (0.876)
Observations	72,184	72,184	66,345	66,345	27,458	27,458	72,184
Number of firms	13,444	13,444	12,540	12,540	6,082	6,082	13,444
Number of clusters	36	36	36	36	36	36	36
R ²	0.0434	0.0511	0.0545	0.0615	0.0566	0.0584	0.0395

Source: Authors' calculations.

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

¹ Robust standard errors (clustered by country), and controlling for time effects and firm-level fixed effects.

¹⁸ This result is consistent with theoretical arguments in Tornell and Westermann 2005, which also provides indirect evidence of stronger financial constraints in the non-tradable sector.

B. Robustness

We check the robustness of our results in several ways. First, we estimate the model adding the lagged investment-to-capital ratio as an explanatory variable, using the difference-in-difference Arellano-Bond approach. The results for the baseline specification remain broadly unchanged (Table 6).¹⁹

Table 6. Robustness: Arellano-Bond Specification¹

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	ICR	ICR	ICR	ICR	ICR	ICR	ICR	ICR	ICR
ICR(t-1)	-0.233*** (0.00750)	-0.231*** (0.00753)	-0.233*** (0.00753)	-0.228*** (0.00798)	-0.228*** (0.00797)	-0.261*** (0.00944)	-0.262*** (0.00943)	-0.262*** (0.00949)	0.272*** (0.00685)
Q	0.0155*** (0.00132)	0.0151*** (0.00132)	0.0151*** (0.00132)	0.0139*** (0.00137)	0.0137*** (0.00136)	0.0132*** (0.00155)	0.0132*** (0.00155)	0.0126*** (0.00156)	0.0228*** (0.000885)
Cash flow		0.00649*** (0.00150)	0.00653*** (0.00151)	0.0140*** (0.00260)	0.0140*** (0.00253)	0.0132*** (0.00303)	0.0131*** (0.00302)	0.0127*** (0.00299)	0.00661*** (0.000849)
Leverage (t-1)			-0.0801*** (0.00584)	-0.0800*** (0.00622)	-0.0737*** (0.00623)	-0.0714*** (0.00736)	-0.0704*** (0.00729)	-0.0701*** (0.00732)	-0.0173*** (0.00162)
Interest expense ratio (t-1)				-0.0245 (0.0254)	-0.0233 (0.0255)	-0.0274 (0.0280)	-0.0240 (0.0280)	-0.0289 (0.0285)	
Change in debt					0.00256*** (0.000764)	0.00211*** (0.000794)	0.00210*** (0.000791)	0.00208*** (0.000793)	0.00271*** (0.000545)
Commodity export price (t-1)						0.000463*** (5.09e-05)	0.000476*** (5.08e-05)	0.000444*** (5.10e-05)	0.000365*** (4.98e-05)
Net capital inflows							0.00234*** (0.000281)	0.00246*** (0.000280)	0.00157*** (0.000136)
Uncertainty								7.57e-06*** (1.74e-06)	
Cash flow x net capital inflows									-0.000464*** (0.000152)
Constant	23.23*** (1.079)	23.17*** (1.071)	23.67*** (1.086)	22.49*** (1.100)	22.34*** (1.096)	17.40*** (1.271)	17.39*** (1.271)	17.13*** (1.282)	2.282*** (0.354)
Observations	72,049	72,016	72,001	63,098	63,090	48,459	48,459	47,742	71,476
Number of firms	13,826	13,824	13,823	12,383	12,380	9,875	9,875	9,825	13,354
R ² between									0.422
R ² overall									0.206

Source: Authors' calculations.

Note: Robust standard errors in parentheses

¹ Difference-in-difference Arellano-Bond specification with robust standard errors, and controlling for time effects.

Second, we use cash stock rather than cash flow to measure availability of internal funds. Some previous studies (e.g., Harrison and others, 2004) have used the cash stock because it is assumed to be less likely to be associated with the future growth opportunities than the cash flow measure (see Love, 2003 for further discussion). The results are reported in Table 7. Using cash stock rather than cash flow does not alter the results regarding the main determinants of corporate investment. Specifically, Tobin's Q, lagged leverage, the change in debt, commodity export prices, as well as the availability of foreign financing all have similar coefficients as before, both in terms of magnitude and statistical significance. Cash stock is also a significant explanatory variable of firms' capital spending, with its coefficient being

¹⁹ All the above results in the previous section hold and are available from authors upon request, to economize on space.

positive and statistically significant. Thus, using cash stock as a measure of availability of internal funds, we still find evidence of financing constraints affecting firms in EMs.

To further test the robustness of our results, we include additional controls. In particular, real GDP growth is added as a proxy for aggregate economic activity but it turns out statistically insignificant—presumably because the effects are captured by some of the other explanatory variables. Commodity import prices are also included as additional regressors, as they may affect the firms’ cost of inputs, particularly in commodity-importer economies. However, this variable appears to be statistically insignificant—with all the other coefficients unchanged. Furthermore, we estimate the model without a few countries with the largest number of firms, such as China, Korea, and Taiwan, as the latter may be driving the results. However, the results hold when we exclude these countries from the sample. Results also hold if we add firm-specific sales as a control.

Table 7. Robustness: Using Cash Stock¹

VARIABLES	(1) ICR	(2) ICR	(3) ICR	(4) ICR
Q	0.0208*** (0.00534)	0.0206*** (0.00530)	0.0193*** (0.00509)	0.0189*** (0.00486)
Cash stock	0.00287** (0.00109)	0.00268** (0.000995)	0.00229** (0.000981)	0.00229** (0.000981)
Leverage (t-1)	-0.0428*** (0.00385)	-0.0394*** (0.00349)	-0.0375*** (0.00308)	-0.0367*** (0.00323)
Interest expense ratio (t-1)	-0.0286 (0.0257)	-0.0295 (0.0266)	-0.0274 (0.0271)	-0.0262 (0.0282)
Change in debt		0.00362*** (0.000988)	0.00339*** (0.00112)	0.00336*** (0.00113)
Commodity export price (t-1)			0.000472*** (0.000109)	0.000498*** (0.000105)
Net capital inflows				0.00237*** (0.000680)
Constant	10.81*** (1.138)	10.79*** (1.147)	9.949*** (0.966)	9.774*** (0.998)
Observations	79,886	79,880	60,990	60,990
Number of firms	14,186	14,186	11,465	11,465
Number of clusters	36	36	34	34
R ²	0.0286	0.0365	0.0351	0.0408

Source: Authors' calculations.

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

¹ Robust standard errors (clustered by country), and controlling for time effects and firm-level fixed effects.

As mentioned before, we also include country fixed effects and the results remain unaltered. To control for time effects we use year dummies, and find evidence of a negative trend in investment-to-capital ratios. Thus, we then use a trend variable rather than year dummies and the baseline results do not change. In the extension incorporating the “RECENT” dummy (Equation 3 and Table 3), as mentioned earlier, the trend variable is used to capture time effects, since having both year dummies and the RECENT dummy one would entail identification/interpretation issues. In other robustness checks, we also lag capital inflows and the change in debt to mitigate potential endogeneity problems, and results remain unaltered. Finally, we also estimate the model including country-time dummies instead of the

country-specific macroeconomic variables. The coefficients on the firm-level variables do not change substantially (both in terms of statistical and economic significance).²⁰

To sum up, we find that beyond the commonly used firm-level variables to explain investment, commodity export prices and capital inflows are relevant to understand firms' investment decisions. The average EM firm exhibits financial constraints. Larger firms and those more financially integrated with global financial markets tend to have higher investment-to-capital ratios and have weaker financial constraints. Capital inflows help ease these constraints, especially for firms in the non-tradable sector. As to the recent investment slowdown, it can be explained mainly by the evolution of the determinant factors. We elaborate on their relative importance next.

C. Explaining the Recent Investment Weakening

An interesting result that emerges from the analysis in the previous section is that the impact on corporate investment of changes in its main determinants does not appear to have changed investment growth since the mid-2011 peak. But, which of these factors has played the biggest role in explaining the recent investment deceleration? And does the relative contribution of each factor vary across region? We explore these questions in this final section. The contribution of each of the determinants to the post-2011 investment-to capital ratio moderation in the average firm is computed by multiplying this period's change in each factor by its corresponding estimated marginal effect. Specifically, for each region we look at the estimated coefficients in the corresponding region-specific regression. The marginal effect of each variable in the recent (post-2011) period is computed as the sum of the coefficient associated with that variable and the coefficient on the interaction term (of that variable with the RECENT dummy), if the latter is statistically significant. Then, this marginal effect is multiplied by the change in the explanatory variable since 2011 to compute the overall contribution of the latter to the recent slowdown.

Formally, the contribution of each factor X in region j (conditional on being statistically significant) is given by

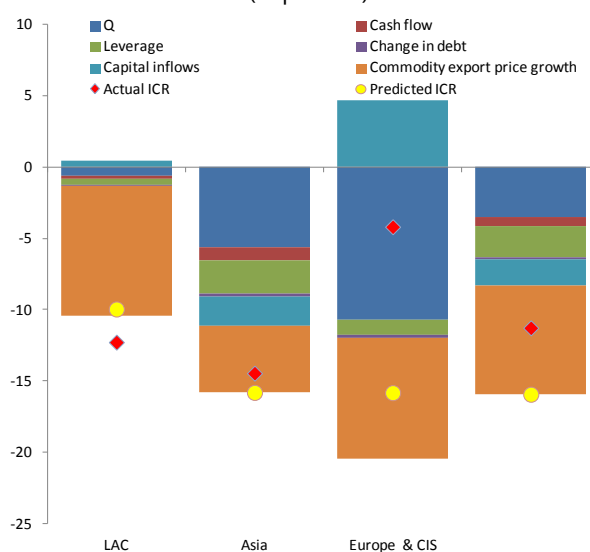
$$\left(\beta_j^h + \eta_j^h\right) \Delta X_j \Big|_{2011-13} \quad \text{for } X_j = \left\{ \frac{CF_{j,t}}{K_{j,t-1}}, Lev_{j,t-1}, \frac{\Delta Debt_{j,t}}{K_{j,t-1}}, P_{j,t-1}^x, KI_{j,t} \right\}, \quad j = \text{LAC, ASIA, EUR, Other} \quad (4)$$

²⁰ These country-time dummies capture time-varying idiosyncratic domestic factors, which are positively correlated with our country-specific macro variables—particularly commodity export prices. Our baseline specification given by equation (1) does not necessarily capture all possible domestic factors that may influence firms' investment. But this does not affect the interpretation of our results on commodity export prices, since these are mostly exogenous to the country and most likely are not affected by any other domestic variable not included in the model. That is, there may be other relevant domestic factors, for example a political cycle, but this should not be correlated with commodity export prices and therefore it should not be biasing the estimated coefficient on the latter.

The recent weakening in business investment in the average firm can be, to a large extent, explained by the evolution of its main explanatory factors (Figure 8), especially in LAC and emerging Asia.²¹ However, our results suggest that the relative contribution of each of the determinants has been different across regions. Lower commodity export prices emerge as the largest contributor to the slowdown, particularly for LAC and the CIS economies. The substantial contributions of weaker commodity prices to the decline in private investment growth observed since 2011 is not surprising given the large share of commodity sectors in private investment in these regions.

Lower expectations of firms' future profitability (as measured by Tobin's Q) have also been an important factor behind the weakening of investment in EMs. This is likely to reflect, at least partly, the downward revisions to potential growth observed in many EMs in the last three years, as well as a general sense of leaner times associated with weaker external demand and tighter global financial conditions.²²

Figure 8. Contributions to the Recent Slowdown¹
(In percent)



Source: Authors' calculations.

¹ Relative contribution of each factor to the 2011-13 investment slowdown.

Corporate investment has also been influenced by the declining availability of international financing in recent years, particularly in emerging Asia. A number of economies have seen a moderation in capital inflows since 2012,²³ and our firm-level regressions suggest that this

²¹ The sum of the contributions of each variable adds to the fitted value presented in the figure. Thus, the illustrated fitted value does not include the impact of fixed effects.

²² Potential GDP growth has slowed considerably in EMs as a whole, by about 1.2 percentage points since 2011. See Chapter 3 of the April 2015 *World Economic Outlook*.

²³ See Chapter 4 of the October 2013 *World Economic Outlook* and the IMF 2014 *Spillover Report*.

explains a non-negligible share of the investment slowdown. Higher corporate leverage (presumably increasing the external finance premium), and lower internal cash flow have also played a role, especially in Asian EMs.²⁴

V. CONCLUDING REMARKS

Following brisk private investment growth rates in EMs during the boom years of the 2000s that peaked in mid-2011, there has been a gradual slowdown in recent years. In this paper we document recent trends in private investment in EMs, with a focus on understanding the recent slowdown. We analyze the main determinants of business investment using standard panel regression models drawing on a combination of firm-level data for about 16,000 firms and, critically, country-specific macroeconomic variables (notably commodity export prices and capital inflows) for 38 EMs over the period 1990–2013. We identify the key factors driving firms' investment decisions in EMs, examine which of these factors have been the main drivers of the recent investment weakness, and to what extent the relative contribution of each factor varied across regions.

We document that although private investment growth in EMs has declined in recent years, it came down from a boom period and remains close to pre-crisis levels. Moreover, investment-to-output ratios also remain close to or above historical averages for most EMs despite their recent moderation.

Consistent with theoretical arguments and previous empirical work, our regressions provide robust evidence that firms in EMs increase capital spending when expected future profitability (measured by Tobin's Q) is higher. Debt stocks and flows tend to have opposing effects on firms' investment. While the flow of debt is positively associated with capital expenditure, leverage is negatively associated with it, particularly for firms in emerging Asia. We also find robust evidence of a positive impact of firms' cash flow on capital spending, in line with results in the existing literature. The sensitivity of investment to the availability of internal funds suggests that EM firms face borrowing constraints.

We also find, adding to the existing literature, that investment is positively associated with changes in (country-specific) commodity export prices, particularly in LAC and CIS. Moreover, business investment is positively influenced by the availability of foreign (international) financing. Furthermore, capital inflows help relax firms' financial constraints, with the sensitivity of investment to cash flow weakening with higher capital inflows. But other firm-specific characteristics matter. Larger firms (measured by the size of either assets or revenues) and those more integrated to international financial markets exhibit, on average,

²⁴ The result for leverage is in line with Chapter 2 of the April 2014 *Regional Economic Outlook: Asia and Pacific*.

weaker financial constraints. And the extent of the relaxation of financial constraints driven by capital inflows is stronger for firms in the non-tradable sector.

Our results suggest that the investment weakening of the past three years can be explained by the evolution of its main determinants. However, there has been some heterogeneity in terms of their relative contribution. The sharp decline in commodity prices has been a key factor especially in LAC and CIS economies (which include large net commodity exporters). Lower expected profitability of firms (which partly reflects the downward revisions to potential growth in many EMs) has played an important role too. The moderation in capital inflows to EMs, increased corporate leverage, and lower cash flows, have also been significant drivers of the recent business investment weakening, especially in emerging Asia.

The private investment weakening in EMs has not represented a slump, but rather a slowdown after a period of boom. Yet, policymakers should not be complacent. First, prospects for a recovery of business investment are not promising, as the outlook for most of its determinants is generally dim. Commodity prices are expected to remain weak, capital inflows to EMs are likely to moderate further, and external financial conditions are set to become tighter, including because of the impact of the normalization of the U.S. monetary policy. The recent declines in potential growth estimates for most EMs are also likely to be a drag on business investment going forward. Moreover, investment ratios are still relatively low in some EM regions, particularly in LAC, so boosting private investment remains a policy priority.

In light of our results on the size and persistence of financing constraints, especially for smaller firms, business investment in EMs would benefit from further deepening domestic financial systems, strengthening capital market development, and promoting access to finance—of course, subject to sufficient safeguards to ensure financial stability. Strengthening financial infrastructure and legal frameworks, and enhancing capital market access to funding for small and mid-sized firms would be positive measures.

More generally, and beyond the scope of this paper, structural reforms to boost productivity could help unlocking private investment and output growth. The design of a policy agenda of structural reforms is a difficult task and entails country-specific considerations, but in many EMs efforts to improve infrastructure and human capital, strengthen the business climate, and foster competition are key priorities.

APPENDIX

Table A.1. Firm-Level Panel Regressions: List of Countries

Country	Number of firms	Country	Number of firms
ARGENTINA	1,073	MOROCCO	538
BRAZIL	3,100	PAKISTAN	2,342
BULGARIA	1,164	PERU	1,436
CHILE	3,103	PHILIPPINES	2,708
CHINA	22,799	POLAND	3,602
COLOMBIA	753	ROMANIA	770
CROATIA	545	RUSSIAN FEDERATION	4,998
CZECH REPUBLIC	511	SERBIA	534
EGYPT	1,227	SINGAPORE	7,982
HUNGARY	563	SLOVAKIA	237
INDIA	17,480	SLOVENIA	361
INDONESIA	4,355	SOUTH AFRICA	5,381
ISRAEL	3,618	SRI LANKA	1,551
JORDAN	1,538	TAIWAN	17,997
KAZAKHSTAN	223	THAILAND	7,065
KOREA (SOUTH)	17,245	TURKEY	2,453
LITHUANIA	225	UKRAINE	375
MALAYSIA	12,814	VENEZUELA	378
MEXICO	2,096	VIETNAM	3,515

Table A.2. Regional Decomposition¹

	LAC	Asia	Europe	Other	LAC	Asia	Europe	Other
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	ICR	ICR	ICR	ICR	ICR	ICR	ICR	ICR
Q	0.0179*** (0.00369)	0.0177*** (0.00543)	0.0196*** (0.00520)	0.0293*** (0.00289)	0.0182*** (0.00360)	0.0176** (0.00546)	0.0196*** (0.00519)	0.0288*** (0.00331)
Cash flow	0.00496 (0.00521)	0.0126** (0.00460)	0.00105 (0.00176)	0.00398 (0.00211)	0.00655 (0.00646)	0.0125*** (0.00383)	0.000604 (0.00119)	0.00377 (0.00228)
Leverage (t-1)	-0.0337** (0.0131)	-0.0326*** (0.00363)	-0.0160* (0.00736)	-0.0238* (0.0112)	-0.0336** (0.0132)	-0.0325*** (0.00355)	-0.0160* (0.00744)	-0.0236* (0.0111)
Change in debt	0.00104 (0.00104)	0.00265* (0.00127)	0.00172 (0.00135)	0.00821*** (0.00151)	0.00113 (0.00113)	0.00265* (0.00126)	0.00163 (0.00147)	0.00830*** (0.00150)
Net capital inflows	0.00187 (0.00172)	0.00263** (0.000918)	0.00291* (0.00145)	0.00152* (0.000688)	0.00187 (0.00173)	0.00265** (0.000915)	0.00289* (0.00145)	0.00168** (0.000576)
Commodity export price (t-1)	0.000478** (0.000169)	0.000469*** (0.000114)	0.000498*** (9.46e-05)	-0.000221 (0.000360)	0.000488** (0.000180)	0.000385*** (0.000111)	0.000510*** (0.000103)	-0.000219 (0.000362)
Recent	-0.00535 (0.0168)	-0.000711 (0.00615)	0.000756 (0.00966)	-0.0453** (0.0120)	0.0184 (0.0197)	-0.00968 (0.00668)	0.00257 (0.0117)	-0.0459** (0.0133)
Recent x cashflow	0.0284* (0.0145)	-0.000693 (0.00687)	-0.00149 (0.00219)	-0.00574 (0.00317)				
Recent x commodity export price (t-1)					0.00267*** (0.000626)	-0.00109*** (0.000328)	0.000329 (0.000336)	0.000391 (0.000704)
Constant	3.994 (2.104)	10.02*** (0.872)	11.88* (6.513)	5.308 (2.928)	4.235* (2.122)	9.702*** (0.791)	11.99* (6.581)	5.366 (2.918)
Observations	5,532	53,436	7,740	5,476	5,532	53,436	7,740	5,476
Number of firms	884	9,534	1,897	1,129	884	9,534	1,897	1,129
Number of countries	7	10	13	6	7	10	13	6

Source: Authors' calculations.

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

¹ Robust standard errors (clustered by country), and controlling for time effects and firm-level fixed effects.

Table A.3. Regional Decomposition¹

	LAC	Asia	Europe	Other	LAC	Asia	Europe	Other
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	ICR	ICR	ICR	ICR	ICR	ICR	ICR	ICR
Q	0.0181*** (0.00361)	0.0176** (0.00546)	0.0197*** (0.00522)	0.0290*** (0.00338)	0.0191*** (0.00347)	0.0172** (0.00560)	0.0194*** (0.00456)	0.0287*** (0.00269)
Cash flow	0.00657 (0.00647)	0.0125*** (0.00384)	0.000603 (0.00119)	0.00377 (0.00228)	0.00658 (0.00647)	0.0125*** (0.00384)	0.000599 (0.00119)	0.00376 (0.00226)
Leverage (t-1)	-0.0341** (0.0131)	-0.0321*** (0.00370)	-0.0160* (0.00746)	-0.0229* (0.0108)	-0.0336** (0.0132)	-0.0326*** (0.00365)	-0.0161* (0.00751)	-0.0236* (0.0111)
Change in debt	0.00113 (0.00113)	0.00265* (0.00125)	0.00163 (0.00148)	0.00830*** (0.00149)	0.00113 (0.00113)	0.00264* (0.00126)	0.00162 (0.00149)	0.00830*** (0.00150)
Net capital inflows	0.00187 (0.00172)	0.00262** (0.000920)	0.00292* (0.00145)	0.00151* (0.000688)	0.00193 (0.00172)	0.00260** (0.000901)	0.00290* (0.00145)	0.00158* (0.000672)
Commodity export price (t-1)	0.000477** (0.000174)	0.000441*** (0.000121)	0.000486*** (0.000107)	-0.000241 (0.000358)	0.000468** (0.000174)	0.000471*** (0.000113)	0.000500*** (0.000101)	-0.000225 (0.000353)
Recent	0.00368 (0.0187)	0.000749 (0.00639)	0.00116 (0.00950)	-0.0463** (0.0124)	0.0145 (0.0151)	-0.00633 (0.00831)	-0.00196 (0.00547)	-0.0502* (0.0205)
Recent x leverage (t-1)	0.00491* (0.00239)	-0.00672* (0.00352)	-0.00339 (0.00622)	-0.00952 (0.0114)				
Recent x Q					-0.00553 (0.00467)	0.00375 (0.00227)	0.00197 (0.00941)	0.00136 (0.0102)
Constant	4.110 (2.144)	9.908*** (0.848)	11.80* (6.561)	5.188 (2.872)	4.045 (2.140)	10.06*** (0.870)	11.95* (6.691)	5.334 (3.091)
Observations	5,532	53,436	7,740	5,476	5,532	53,436	7,740	5,476
Number of firms	884	9,534	1,897	1,129	884	9,534	1,897	1,129
Number of countries	7	10	13	6	7	10	13	6

Source: Authors' calculations.

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

¹ Robust standard errors (clustered by country), and controlling for time effects and firm-level fixed effects.**Table A.4. Regional Decomposition¹**

	LAC	Asia	Europe	Other	LAC	Asia	Europe	Other
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	ICR	ICR	ICR	ICR	ICR	ICR	ICR	ICR
Q	0.0181*** (0.00363)	0.0177** (0.00546)	0.0197*** (0.00516)	0.0289*** (0.00330)	0.0179*** (0.00368)	0.0177** (0.00548)	0.0197*** (0.00523)	0.0298*** (0.00343)
Cash flow	0.00636 (0.00648)	0.0125** (0.00385)	0.000843 (0.00131)	0.00372 (0.00223)	0.00490 (0.00515)	0.0124** (0.00390)	0.000813 (0.00119)	0.00506*** (0.00119)
Leverage (t-1)	-0.0337** (0.0131)	-0.0324*** (0.00374)	-0.0137* (0.00652)	-0.0236* (0.0114)	-0.0338** (0.0131)	-0.0326*** (0.00366)	-0.0161* (0.00740)	-0.0259* (0.0116)
Change in debt	0.000972 (0.00110)	0.00288** (0.00110)	0.00277** (0.000909)	0.00847*** (0.00159)	0.00105 (0.00104)	0.00265* (0.00126)	0.00168 (0.00140)	0.00690*** (0.00128)
Net capital inflows	0.00192 (0.00172)	0.00263** (0.000925)	0.00291* (0.00145)	0.00156* (0.000718)	0.00182 (0.00173)	0.00263** (0.000926)	0.00291* (0.00145)	0.00248* (0.00104)
Commodity export price (t-1)	0.000467** (0.000175)	0.000469*** (0.000114)	0.000495*** (9.52e-05)	-0.000224 (0.000354)	0.000489** (0.000163)	0.000470*** (0.000114)	0.000498*** (9.50e-05)	-0.000246 (0.000353)
Recent	0.00334 (0.0190)	-0.000412 (0.00616)	0.000220 (0.0102)	-0.0479** (0.0122)	-0.00455 (0.0173)	-0.000938 (0.00605)	0.000447 (0.00986)	-0.0510** (0.0132)
Recent x change in debt	0.00687** (0.00243)	-0.00116 (0.000738)	-0.00355 (0.00225)	-0.00392* (0.00172)				
Recent x capital inflows					0.00843 (0.00463)	-0.000111 (0.000404)	-0.000264 (0.000309)	-3.62e-05 (0.000522)
Constant	4.048 (2.144)	10.02*** (0.871)	11.94* (6.589)	5.317 (2.926)	4.061 (2.102)	10.02*** (0.872)	11.86* (6.512)	5.370 (2.956)
Observations	5,532	53,436	7,740	5,476	5,532	53,436	7,740	5,476
Number of firms	884	9,534	1,897	1,129	884	9,534	1,897	1,129
Number of countries	7	10	13	6	7	10	13	6

Source: Authors' calculations.

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

¹ Robust standard errors (clustered by country), and controlling for time effects and firm-level fixed effects.

Table A.5. Firm-level Panels: Tradable/non-tradable Sectors

Tradables	Non-Tradables
Chemicals	Banks
Basic Resources	Construction & Materials
Industrial Goods & Services	Financial Services
Automobiles & Parts	Health Care
Food & Beverages	Media
Oil & Gas	Personal & Household Goods
Technology	Real Estate
	Retail
	Telecommunications
	Travel & Leisure
	Utilities

REFERENCES

- Abel, A. and J. Eberly (2011), "How Q and Cash Flow Affect Investment Without Frictions: An Analytical Explanation," *Review of Economic Studies* 78, pp. 1179-1200.
- Baum, C., M. Caglayan, and O. Talavera (2008), "Uncertainty Determinants of Firm Investment", *Economic Letters* 98, pp. 282-287.
- Blanchard, O., C. Rhee, and L. Summers (1993), "The Stock Market, Profit and Investment," *Quarterly Journal of Economics*, 108(1), 115-136.
- Bloom, N., S. Bond, and J. Van Reenen (2001), "The Dynamics of Investment Under Uncertainty," Working Papers WP01/5. Institute for Fiscal Studies.
- Brauman, R. and R. Kopcke (2001), "The Performance of Traditional Macroeconomic Models of Businesses' Investment Spending," *New England Economic Review*, November (2), pp. 3-39.
- Brown, J. and B. Petersen (2009), "Why has the Investment-Cash Flow Sensitivity Declined so Sharply? Rising R&D and Equity Market Developments," *Journal of Banking and Finance*, 33, pp. 971-984.
- Carpenter, R. and A. Guariglia (2008), "Cash Flow, Investment, and Investment Opportunities: New Tests using UK Panel Data," *Journal of Banking and Finance*, 32, pp.1894-1906.
- Dixit, A. and R. Pindyck (1994), "Investment under Uncertainty," Princeton University Press (Princeton, New Jersey: Princeton University Press).
- Fazzari, S., G. Hubbard, and B. Petersen (1998), "Financing Constraints and Corporate Investment," *Brooking Papers on Economic Activity*, 1:1998, pp. 141-195.
- Fazzari, S., G. Hubbard, and B. Petersen (2000), "Investment-Cash Flow Sensitivities are Useful: A Comment on Kaplan and Zingales," *The Quarterly Journal of Economics*, 115(2), 695-705.
- Fernandez, A., A. Gonzales, and D. Rodriguez (2014), "Riding the Commodity Roller Coaster Together: Common Factors in Business Cycles of Emerging Economies," mimeo.
- Forbes, K. (2007), "The Microeconomic Evidence on Capital Controls: No Free Lunch," in *Capital Controls and Capital Flows in Emerging Economies: Policies, Practices, and Consequences*, Sebastian Edwards (editor), University of Chicago: University of Chicago Press for the National Bureau of Economic Research pp. 171-199.

- Fornero, J., M. Kirchner, and A. Yany (2014), “Terms of Trade Shocks and Investment in Commodity-Exporting Economies,” Central Bank of Chile Working Paper, mimeo (Santiago: Central Bank of Chile).
- Gelos, G. and A. Werner (2002), “Financial Liberalization, Credit Constraints, and Collateral: Investment in the Mexican Manufacturing Sector,” *Journal of Development Economics* Vol. 67, pp. 1-62.
- Gilchrist, S. and C. Himmelberg (1995), “Evidence on the Role of Cash Flow for Investment,” *Journal of Monetary Economics*, 36, pp. 541-572.
- Gomes, J. (2001), “Financing Investment,” *American Economic Review*, 1263–1285.
- Gruss, B. (2014), “After the Boom—Commodity Prices and Economic Growth in Latin America and the Caribbean,” IMF Working Paper 14/154 (Washington: International Monetary Fund).
- Harrison, A., I. Love, and M. McMillan (2004), “Global Capital Flows and Financing Constraints,” *Journal of Development Economics* 75, pp. 269–301.
- Hayashi, F. (1982), “Tobin's Marginal Q and Average Q: A Neoclassical Interpretation,” *Econometrica*, 50 (1), 213-224.
- Ilzetzki, I., C. Reinhart, and K. Rogoff (2012) “Exchange Rate Arrangements into the 21st Century: Will the Anchor Currency Hold?” mimeo.
- Kalemli-Ozcan, S., L. Laeven, and D. Moreno (2015), “Debt Overhang in Europe: Evidence from Firm-Bank-Sovereign Linkages,” mimeo, forthcoming.
- Kalemli-Ozcan, S., B. Sorensen, and S. Yesiltas (2013), “Leverage across Firms, Banks, and Countries,” *Journal of International Economics*, Vol. 88, No. 2, March, pp. 495–510.
- Kaplan, S.N., and L. Zingales (1997), “Do Investment-Cash Flow Sensitivities Provide Useful Measures of Financing Constraints?” *Quarterly Journal of Economics* 112, (1, February), pp.169-216.
- Laeven L., “Does Financial Liberalization Reduce Financing Constraints?,” *Financial Management*, Vol. 32, No. 1, Spring 2003.
- Leahy, J. and T. Whited (1996), “The Effects of Uncertainty on Investment: Some Stylized Facts,” *Journal of Money, Credit, and Banking*, Vol. 28, Issue 1, pp.64–83.
- Magud, N. (2008), “On Asymmetric Business Cycles and the Effectiveness of Counter-Cyclical Fiscal Policies,” *Journal of Macroeconomics*, 30, 885–905.

- Medina, J.P. and R. Valdés (1998), “Flujo de Caja y Decisiones de Inversión en Chile: Evidencia de Sociedades Anónimas Abiertas,” *Cuadernos de Economía*, 36, diciembre, pp. 301–323.
- Ross, K. and M. Tashu (2015), “Investment Dynamics in Peru,” in *Peru: The Challenge of Managing Success*, by Alejandro Santos (editor), forthcoming (Washington: International Monetary Fund).
- Tobin, J. (1969), “A General Equilibrium Approach To Monetary Theory,” *Journal of Money, Credit, and Banking*, Vol. 1, (1), February, pp. 15–29.
- Tornell, A. and F. Westermann (2005), “Boom-Bust Cycles and Financial Liberalization,” The MIT Press, (Massachusetts: The MIT Press).