# 4. Recent Investment Weakness in Latin America: Is There a Puzzle?

*After peaking in 2010–11, real investment has decelerated in Latin America and the Caribbean (LAC), in line with developments in other emerging markets. Coming down from cyclical highs, however, investment ratios are still above historical averages in most countries in the region. This chapter examines the key factors determining the behavior of private investment. The analysis suggests that the sharp decline in commodity export prices is the main driver behind the investment slowdown in Latin America. Lower current cash flows and expected profitability, and increased corporate leverage at the firm level have also played a role, though to a more limited extent than elsewhere. Given the subdued outlook for many key drivers of corporate capital spending, a robust investment recovery in Latin America seems relatively unlikely, unless policymakers can make decisive progress in improving conditions for private investment.*

Figure 4.1

**Real Private Investment Growth**
*(Percent change)*



Sources: IMF, World Economic Outlook database; and IMF staff calculations.
Note: CIS = Commonwealth of Independent States; LAC = Latin America and the Caribbean. Purchasing power parity–weighted GDP average.

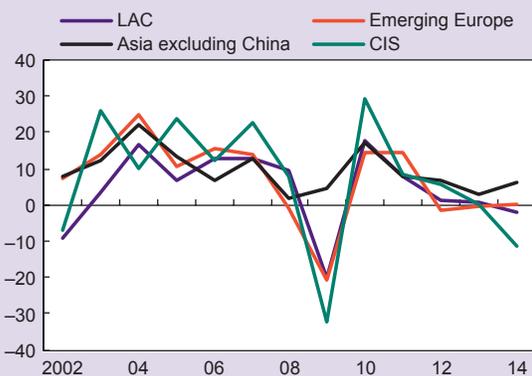## Recent Investment Dynamics: The Slowdown in Perspective

After peaking in 2010–11, investment growth has slowed markedly in emerging market economies. Most emerging market regions, including LAC, have shared similar investment dynamics—robust growth in the period before the global financial crisis, a sharp contraction in 2009 followed by a rapid and strong rebound, and a sustained deceleration in the last three years (Figure 4.1). The latter has been most pronounced in emerging Europe, where investment growth has stalled since 2012, and especially in the Commonwealth of Independent States, where it turned negative in 2014 owing to events in Russia and Ukraine.

Moreover, the recent slowdown in investment has come essentially as a surprise. As shown in Box 1.2 of the October 2014 *World Economic Outlook*, investment accounted for the largest share of forecast revisions in emerging markets during 2011–13. This naturally raises the question whether

anything unusual has been going on. Is there a puzzle about the continued weakness of investment in emerging markets?[1]

In LAC, the prima facie evidence does not necessarily point to a puzzle. The average ratio of private investment (the largest component of total investment and our focus in the remainder of this chapter) to output has declined recently and is now below the levels observed just before the global financial crisis, but remains above the average of the last three decades. In emerging Asia, ratios to GDP are still in line with precrisis levels—and much higher than in LAC—despite having eased in the last three years (Figure 4.2).

Looking across emerging markets, private investment is highly correlated with commodity prices (Figure 4.3). The comovement between private investment and (country-specific) gross commodity export prices is especially strong in LAC and Commonwealth of Independent States (with correlation coefficients of 0.84), reflecting

---

Note: Prepared by Nicolás E. Magud and Sebastián Sosa. Genevieve Lindow provided excellent research assistance. See Magud and Sosa (2015) for technical details.

[1] Chapter 4 of the April 2015 *World Economic Outlook* addresses a similar question for a group of advanced economies.

Figure 4.2

**Private Investment Ratios**
*(Percent of GDP)*
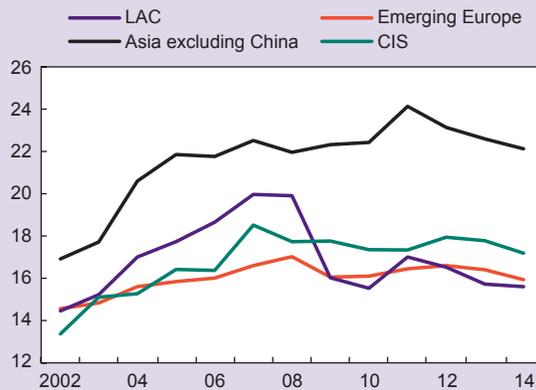


Sources: IMF, World Economic Outlook database; and IMF staff calculations.
Note: CIS = Commonwealth of Independent States; LAC = Latin America and the Caribbean. Investment ratios are purchasing power parity–weighted GDP averages.

Figure 4.3

**Real Private Investment and Commodity Export Price Growth, 2004–14**
*(Percent change)*



Sources: Gruss (2014); IMF, World Economic Outlook database; and IMF staff calculations.
Note: Purchasing power parity–weighted GDP averages.

that these two regions include many commodity-exporting firms.[2] Focusing on quarterly data for the most recent period, both commodity prices and private investment growth rates peaked around mid-2011 and have declined since. In LAC, the sharp decline in commodity export prices has reinforced a general sentiment of leaner times—associated with significant downward revisions to potential growth that have arguably caused firms to curtail their capital expenditure. In addition, private investment in emerging markets has also been positively correlated with capital inflows, suggesting a role for external financing conditions in explaining domestic investment dynamics.

# What Determines Private Investment in Emerging Markets?

To study the main determinants of private investment and whether the recent deceleration can be explained by these determinants, we draw on both firm-level and macroeconomic regression analysis.

## Firm-Level Data Panel Regressions

We start by looking at investment at the firm level. At the outset, it is worth noting that the share of total private investment accounted for by corporate investment ranges between 70 percent and 75 percent across countries in LAC (based on the countries for which disaggregated data are available). Moreover, corporate investment has been the main driver of the ongoing downturn (although residential investment has also weakened in some countries).[3]

---

[2] This is consistent with findings in other studies. For example, Fernandez, Gonzales, and Rodriguez (2014) document that, on average, emerging markets are commodity exporters and tend to respond procyclically to country-specific commodity prices.

[3] The firm-level data in the sample represent about 12 percent of aggregate private investment (from the national accounts), with correlation coefficients between these time series varying by country but averaging over 30 percent.
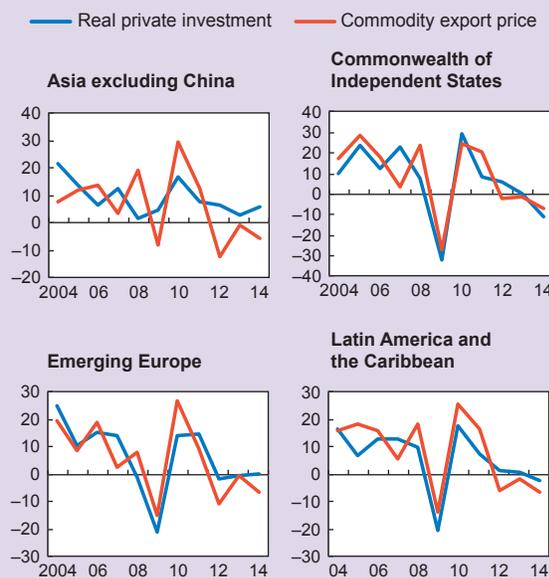
The empirical model of investment combines firm-level determinants and country-specific macroeconomic variables in a panel framework. Our baseline specification is derived from the standard Q theory of investment.[4] We use Tobin's Q and cash flow measures as proxies for marginal profitability and financing constraints, respectively.[5] As is standard in the literature, a higher dependence on internal funding is interpreted as evidence of tighter external financing constraints.[6] Also in line with earlier studies, we include several additional corporate financial variables at the firm level (cost of debt, leverage, and debt flows).[7] To this standard list of regressors we add three country-specific macroeconomic variables—commodity export prices, net capital inflows, and uncertainty—that may also affect corporate investment and are the principal focus of this chapter.[8]

Our linear panel regressions allow for both time and firm fixed effects to capture other unobserved influences on corporate investment.[9] The specification combines firm-level and country-level data, so we compute standard errors that are robust to clustering by country. Thus, the baseline specification is as follows:

$$\frac{I_{ic,t}}{K_{ic,t-1}} = \alpha + \beta_1 Q_{ic,t} + \beta_2 \frac{CF_{ic,t}}{K_{ic,t-1}} + \beta_3 Lev_{ic,t-1}$$

$$+ \beta_4 \frac{\Delta Debt_{ic,t}}{K_{ic,t-1}} + \beta_5 Int_{ic,t-1} + \beta_6 P_{c,t-1}^x \quad (4.1)$$

$$+ \beta_7 KI_{c,t} + \beta_8 Unc_{c,t} + d_i + d_t + \varepsilon_{ic,t}$$

where subscripts *(ic,t)* stand for firm *i* in country *c* during period *t*. *I* is investment, measured as the firm's purchases of gross fixed assets; and *K* is the stock of capital, measured as the total net value of property, plant, and equipment. *Q* represents the standard Tobin's Q, and is measured as the price-to-book-value of the company's equity. *CF* denotes the firm's cash flow, computed as net profits from operating activities; *Lev* is leverage, measured as the ratio of total debt to total assets; *ΔDebt* stands for the change in total debt since the previous period; and *Int* is the firm's effective interest rate paid on total debt.[10] *KI* denotes (net) capital inflows at the country level; *Px* denotes (the log difference) of the commodity export price index;[11] and *Unc* stands for aggregate uncertainty, measured as the volatility of stock market prices. Finally, *ε* represents an error term.[12]

Table 4.1 reports the results of the baseline specification. Column 1 shows that all coefficients for the firm-level variables have the expected sign and are statistically significant at the 1 percent level (except for the cost of debt, which is significant only at the 10 percent level). Tobin's Q is positively related to investment, indicating that firms that financial markets expect to be more profitable tend to invest more, a common result in the literature. In quantitative terms, a one standard deviation shock to

---

[4] See, for example, Gilchrist and Himmelberg (1995).

[5] Marginal Q is unobservable and typically proxied by average Q. Hayashi (1982) discusses the conditions under which both measures are equivalent.

[6] See, for example, Fazzari, Hubbard, and Petersen (1988, 2000); and Blanchard, Rhee, and Summers (1994).

[7] Lagging these variables does not change the results, while mitigating potential endogeneity issues.

[8] Chapter 1 of the October 2014 *Global Financial Stability Report* relies on a similar firm-level approach to examine the determinants of investment for a set of advanced economies, although it does not include any macroeconomic variable.

[9] The results are also robust to the inclusion of country fixed effects.

[10] Firm-level data are from Worldscope and cover about 16,000 publicly traded firms from 38 emerging markets for the period 1990–2013. Figure A4.1 in the Annex illustrates the variation of the main firm-level data across regions, particularly between emerging Asia and Latin America.

[11] Commodity export prices are lagged, capturing the idea of a delayed response owing to decision and implementation lags. The same applies to firms' cost of debt.

[12] Regarding the macroeconomic variables, the (country-specific) gross commodity export price indices are from Gruss (2014). They are constructed by weighting changes in international prices of individual commodities by their share in commodity exports—and can be considered exogenous to each country. 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 World Economic Outlook databases. Finally, we use data from Bloomberg, L.P., to construct our measure of country-specific uncertainty based on the average monthly volatility of stock market returns.

## Table 4.1. Firm-Level Data Panel Regressions

|  | (1) ICR | (2) ICR | (3) ICR | (4) ICR | (5) ICR | (6) ICR |
|---|---|---|---|---|---|---|
| Tobin's Q | 0.0200*** | 0.0188*** | 0.0184*** | 0.0179*** | 0.0192*** | 0.0191*** |
|  | (0.00508) | (0.00490) | (0.00465) | (0.00465) | (0.00445) | (0.00451) |
| Cash flow | 0.0118*** | 0.0114*** | 0.0114*** | 0.0112*** | 0.00609*** | 0.00608*** |
|  | (0.00208) | (0.00221) | (0.00219) | (0.00212) | (0.00136) | (0.00136) |
| Leverage $(t - 1)$ | −0.0340*** | −0.0323*** | −0.0315*** | −0.0318*** | −0.0308*** | −0.0307*** |
|  | (0.00345) | (0.00292) | (0.00305) | (0.00315) | (0.00311) | (0.00312) |
| Interest expense ratio $(t - 1)$ | −0.0448* | −0.0415 | −0.0394 | −0.0421 |  |  |
|  | (0.0261) | (0.0274) | (0.0281) | (0.0281) |  |  |
| Change in debt | 0.00334*** | 0.00296*** | 0.00292*** | 0.00291*** | 0.00276*** | 0.00276*** |
|  | (0.000911) | (0.00100) | (0.00101) | (0.00101) | (0.000930) | (0.000930) |
| Commodity export price $(t - 1)$ |  | 0.000445*** | 0.000475*** | 0.000461*** | 0.000449*** | 0.000420*** |
|  |  | (0.000105) | (9.97e-05) | (0.000101) | (9.89e-05) | (8.95e-05) |
| Net capital inflows |  |  | 0.00255*** | 0.00260*** | 0.00266*** | 0.00273*** |
|  |  |  | (0.000680) | (0.000709) | (0.000727) | (0.000753) |
| Uncertainty |  |  |  | 3.80e-06 |  |  |
|  |  |  |  | (3.32e-06) |  |  |
| Cash flow × net capital inflows |  |  |  |  | −0.000671*** | −0.000671*** |
|  |  |  |  |  | (0.000220) | (0.000220) |
| Recent |  |  |  |  |  | −0.00503 |
|  |  |  |  |  |  | (0.00513) |
| Constant | 10.94*** | 10.28*** | 10.04*** | 9.832*** | 9.456*** | 8.935*** |
|  | (1.010) | (0.806) | (0.863) | (1.013) | (0.885) | (0.933) |
| Observations | 83,921 | 64,276 | 64,276 | 63,460 | 72,184 | 72,184 |
| Number of firms | 15,165 | 12,317 | 12,317 | 12,280 | 13,444 | 13,444 |
| Number of countries | 38 | 36 | 36 | 36 | 36 | 36 |
| $R^2$ | 0.0352 | 0.0345 | 0.0414 | 0.0416 | 0.0377 | 0.0378 |

Source: IMF staff calculations.
Note: ICR = investment-to-capital ratio. The regressions include time and firm-level fixed effects. Robust standard errors (clustered by country) in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Tobin's Q raises the investment-to-capital ratio by a substantial 2.9 percentage points, holding everything else fixed. Also in line with previous studies, we find robust evidence of financial constraints, reflected in a positive relationship between firms' cash flow and capital spending. That is, firms in emerging markets need to rely on internal funds to finance investment projects. More leveraged firms, in turn, tend to exhibit lower investment in the following period. Specifically, a one standard deviation increase in leverage tends to be associated with a fall in the investment-to-capital ratio by 3.3 percentage points. Also as expected, debt flows are positively related to capital spending,

arguably because financing investment is one of the main reasons to incur new debt.[13]

We then introduce the country-specific macroeconomic variables (columns 2 to 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, becomes

---

[13] $R^2$ values for these regressions are low, but of similar magnitude to those reported by other studies.

statistically insignificant.[14] We find robust evidence that an increase in a country's commodity export prices is associated with higher investment by firms in that country.[15] On average, a one standard deviation shock changes the investment-to-capital ratio by 0.6 percentage point. Investment by emerging market firms also appears to be positively influenced by the availability of foreign financing. The larger the net capital flows an economy receives, the higher its firms' capital expenditure (with investment-to-capital ratios rising by 1.4 percentage points in response to a one standard deviation change in capital flows). Both coefficients (on commodity export prices and capital inflows) are strongly statistically significant. By contrast, we do not find market uncertainty to be a significant determinant of capital expenditure at the firm level.[16]

We also examine a number of extensions to the baseline investment equation. First, to assess whether capital inflows help to relax financial constraints at the firm level, we add to equation (4.1) an interaction term of capital inflows and corporate cash flow. Column 5 shows that the coefficient on this interaction term is negative and significant. This implies that the larger the capital inflows to an economy, the lower the sensitivity of investment to cash flow, presumably because firms become less dependent on internal funds to finance investment projects.[17]

Next, we focus on the post-2010 period to explore if the recent investment slowdown was unusual in light of the above results. We add

to the equation a dummy variable (*RECENT*) that takes the value of one for all observations during 2011–13.[18] The dummy turns out to be not statistically significant (column 6). Thus, we find no evidence that firms' capital expenditure has been abnormally weak in recent years, at least not beyond what can be explained by the determinants included in our model. Furthermore, this result holds across emerging market regions.[19] It also holds across broad sectors of activity, suggesting that the recent investment slowdown has not been abnormally large in any particular sector. In LAC, moreover, the investment downturn does not appear to be driven by only one specific sector—such as mining or energy. In fact, other tradable sectors (manufacturing) and nontradable sectors (such as construction and transportation) have also experienced a slowdown. That said, data are available only up to 2013, and the most recent declines in commodity prices (especially energy) are likely to affect firms in the primary sector further.

Did the marginal effect of the main determinants change in recent years? We address this question by adding additional terms to the regression, namely interactions of the *RECENT* dummy with the main determinants of investment. The coefficients on these interaction terms are not statistically significant, suggesting that the effect of the main determinants of business investment has remained stable.[20] Looking at the point estimates, however, we find some heterogeneity across emerging market regions: (1) financing constraints have

---

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

[15] Previous studies have documented a related positive effect of the terms of trade on investment—for example, Fornero, Kirchner, and Yany (2014) for Chile, and Ross and Tashu (forthcoming) for Peru.

[16] This result is consistent with previous studies (for example, Leahy and Whited 1996) showing that although uncertainty has a negative effect on investment, the effect generally disappears when Tobin's Q is introduced.

[17] This result is, again, consistent with the existing literature (see, for instance, Harrison, Love, and McMillan 2004).

---

[18] Here, we control for time effects through a time trend rather than year dummies. Inspection of the year dummies used in the baseline specification points to a clear downward trend, justifying the use of a time trend in this regression, which serves to focus on the question of a structural break around 2011, and does not alter any of the main results.

[19] See Table 4 in Magud and Sosa (2015), which reports results for region-specific regressions.

[20] Leverage is an exception, with a negative (and significant) interaction coefficient, implying that the sensitivity of investment to leverage has been larger after 2011 (see Table 3 in Magud and Sosa 2015).

become tighter after 2011 in LAC, (2) the positive relationship between commodity export prices and investment has become stronger in LAC and weaker in Asia, and (3) the impact of leverage on investment has become larger (that is, more negative) in emerging Asia.[21]

Another important question that we explore is how different firm characteristics affect investment (Table A4.2 in Annex 4.1). Larger firms (proxied by the value of assets and by gross income) tend to invest more on average (columns 1 and 3) and face weaker financial constraints (as captured by the interaction terms in columns 2 and 4). Firms more closely linked to international markets, as measured by the share of foreign assets in total assets, also invest more (column 5) and exhibit weaker financial constraints than their less internationally integrated peers (interaction term in column 6). Finally, we find that larger capital inflows help relax financial constraints relatively more for firms in the nontradable sector (column 7).[22]

Our results are robust to adding the lagged investment-to-capital ratio as an explanatory variable, and using the difference-in-difference Arellano-Bond approach. They are also robust to the use of cash stocks rather than cash flows to measure availability of internal funds (see, for instance, Harrison, Love, and McMillan 2004). Results do not change if we include additional macroeconomic regressors, such as real GDP growth and commodity import prices (both variables turn out to be not statistically significant) or country-time dummies instead of the macroeconomic variables. They also hold if either capital inflows or the change in debt is lagged (to minimize potential endogeneity problems). Finally, results are also unaffected by excluding from the sample the countries with the largest number of firms, such as China, Korea, and Taiwan Province of China.

---

[21] See Tables A.2 to A.4 of the Appendix in Magud and Sosa (2015).

[22] The latter is consistent with theoretical arguments in Tornell and Westermann (2005), who also provide indirect evidence of stronger financial constraints in the nontradable sector.

## Macroeconomic Panel Regressions

To complement the firm-level analysis of the previous section, we also run simple macroeconomic panel regressions using quarterly data for 30 emerging markets during 1990–2014. Based on an augmented investment accelerator model, we again focus on the role of capital inflows and commodity export prices as potential drivers of corporate investment. The model, which allows for country and time fixed effects, is as follows:

$$\frac{I_{ct}}{K_{ct-1}} = \alpha + \beta_1 P_{ct}^x + \beta_2 Vix_t + \beta_3 l_{ct-1}$$
$$+ \beta_4 \sum_{s=1}^{n} \frac{\Delta y_{ct-s}}{K_{ct-s-1}} + kf_{ct} + d_c + d_t + \varepsilon_{ct} \qquad (4.2)$$

where $(c,t)$ denote country and period, respectively. The capital expenditure ratio ($I/K$) is modeled as a function of commodity export prices ($P^x$), global uncertainty (proxied by the Chicago Board Options Exchange Market Volatility Index, $VIX$), real lending rates ($l$), real output growth ($\Delta y/K$), and capital inflows ($kf$) in percent of GDP. Data sources are the IMF's *International Financial Statistics* and *World Economic Outlook*.

Table 4.2 reports the results, which largely confirm those of the firm-level regressions. In particular, we find robust evidence that investment is positively related to commodity export prices. Higher global uncertainty appears to reduce investment in emerging markets,[23] and the real lending rate is negatively related to investment. To capture accelerator-type effects, we control for several lags of real GDP growth, but these appear to be not statistically significant (the impact probably being captured by other explanatory variables).[24]

Finally, increased capital inflows are accompanied by higher investment. Interestingly, these results

---

[23] This measure of uncertainty is global, whereas firm-level regressions use country-level uncertainty.

[24] Results are unaffected by whether we use one, two, or three lags.

**Table 4.2. Macroeconomic Panel Regressions**

| | (1) ICR | (2) ICR | (3) ICR | (4) ICR | (5) ICR |
|---|---|---|---|---|---|
| Commodity export price | 6.12e-05*** | 5.57e-05*** | 6.95e-05*** | 7.01e-05*** | 8.42e-05*** |
| | (7.69e-06) | (7.89e-06) | (8.39e-06) | (8.53e-06) | (8.05e-06) |
| Global uncertainty | | −4.79e-05*** | −4.77e-05*** | −5.16e-05*** | −5.14e-05*** |
| | | (1.58e-05) | (1.62e-05) | (1.64e-05) | (1.34e-05) |
| Real lending rate ($t-1$) | | | −4.13e-07* | −7.47e-07*** | 6.37e-07 |
| | | | (2.42e-07) | (2.63e-07) | (4.66e-07) |
| Real GDP growth ($t-1$) | | | | 0.920 | 1.955 |
| | | | | (2.275) | (1.688) |
| Net capital inflows | | | | | 9.52e-05*** |
| | | | | | (1.47e-05) |
| Constant | 1.341*** | 1.297*** | 1.345*** | 1.364*** | 1.517*** |
| | (0.0521) | (0.0539) | (0.0598) | (0.0617) | (0.0684) |
| Observations | 3,091 | 3,091 | 2,770 | 2,683 | 1,879 |
| Number of countries | 32 | 32 | 32 | 32 | 28 |
| $R^2$ | 0.0120 | 0.0142 | 0.0250 | 0.0236 | 0.0647 |

Source: IMF staff calculations.
Note: ICR = investment-to-capital ratio. The regression includes country and time effects. Standard errors in parentheses.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

hold even if we use gross instead of net inflows, and if we use foreign direct investment flows or "other" inflows (mainly bank flows). Thus, results from the macroeconomic panel regressions underscore the significant role of commodity export prices and capital inflows in driving investment in emerging markets.[25]

## Which Factors Have Been Driving the Recent Slowdown?

The results presented thus far suggest that the relationship between corporate investment and its main determinants has not changed since the mid-2011 peak. But which of these determinants has played the biggest role in explaining the recent investment deceleration, particularly in Latin America? We answer this question by computing the contribution of each of the determinants to the average investment slowdown by region, based on the firm-level

regression results.[26] Naturally, large effects can result from either sizable underlying shocks or from economically large coefficient estimates.

The recent weakening in business investment can, to a large extent, be explained by the evolution of a few key variables (Figure 4.4), especially in LAC and emerging Asia. However, the relative contribution of each factor differs across regions. Lower commodity export prices emerge as the biggest contributor to the recent slowdown in LAC and Commonwealth of Independent States economies, arguably reflecting the great weight of the commodity sector in private investment in

[25] As a note of caution, these regressions may not sufficiently control for country heterogeneity, reducing their information content of country-specific relationships.

[26] The contribution of each determinant is computed by multiplying the cumulative change in the variable since 2011 by the estimated marginal effect from a region-specific regression. The marginal effect of each variable in the post-2010 period is computed taking into account the direct effect and the effect on the interaction term of that variable with the *RECENT* dummy if the interaction is statistically significant. Fitted values include the variables depicted in the chart, abstracting from the contributions of fixed effects. By focusing on average effects across each region, we obviously do not attempt to explain investment in the entire cross-section of firms. Indeed, the modest $R^2$ values in Table 4.1 underscore the importance of company-level heterogeneity.

Figure 4.4

**Contributions to the Recent Investment Slowdown**
*(Main effects, percent)*
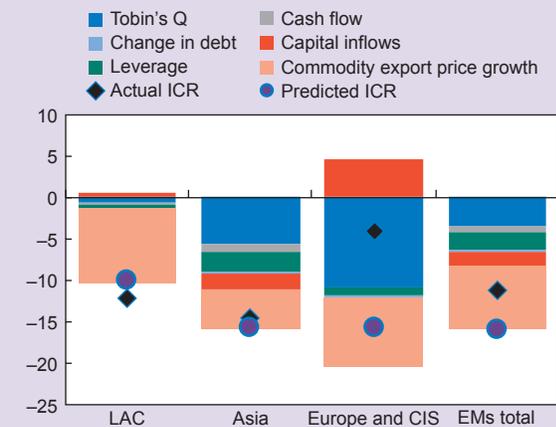


Source: IMF staff calculations.
Note: CIS = Commonwealth of Independent States; EMs = emerging markets;
ICR = investment-to-capital ratio; LAC = Latin America and the Caribbean.
Relative contribution of each factor to the 2011–13 investment slowdown
(averaged across firms in each region). Contributions computed based on
region-specific regression results; fixed effects not included in fixed values.

these regions and the large size of the observed commodity price shock.

More broadly, lower expectations of firms' future profitability (as measured by Tobin's Q) have been an important factor behind the weakening of investment in emerging markets. Corporate investment has also been influenced by the declining availability of international financing in recent years, particularly in emerging Asia. Indeed, a number of economies have seen a moderation in capital inflows since 2012,[27] and our firm-level regressions suggest that this explains a nonnegligible share of the average investment slowdown across firms. This factor, however, has not been relevant in LAC, as capital inflows have remained relatively strong to date. Finally, higher leverage and lower internal cash flow generation have also played a role, especially in Asia.[28]

---

[27] See Chapter 4 of the IMF's October 2013 *World Economic Outlook* and the 2014 "Spillover Report" (IMF 2014c).

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

## A Focus on the Financially Integrated Economies

The behavior of private investment in the LA6—Brazil, Chile, Colombia, Mexico, Peru, and Uruguay, which represent about 75 percent of LAC's GDP—mimics the dynamics described earlier for the region at large, with a downturn observed since 2010–11 (Figure 4.5). The latter has been concentrated in Brazil, Chile, and Peru, whereas in Colombia and Mexico, investment has actually picked up more recently.

In the other commodity exporters, the downturn reflects a collapse in private investment in Venezuela and a more moderate decline in Argentina. In CADR, by contrast, investment growth has picked up in the last two years, presumably linked to the firmer recovery in the United States.

Next, to complement the analysis made in the previous section for a large sample of emerging markets, we estimate country-specific vector autoregressive models for selected LA6 countries to examine more closely the drivers of the recent investment slowdown at the aggregate level.[29] Each vector autoregression includes a set of external factors (commodity export prices, global demand growth, and global financial volatility) and domestic variables (real effective exchange rate, Tobin's Q, real lending rates, real investment growth, and real output growth).[30]

The historical decomposition analysis suggests that lower commodity export prices have been important drivers of the downturn in Brazil, Chile,

---

[29] For the sake of brevity, we focus here exclusively on countries that are facing an investment slowdown.

[30] Commodity export prices are the change in the country-specific index used in the previous exercises, global demand is measured as world real GDP growth, global volatility is measured by the VIX, Tobin's Q is computed as the stock market price index divided by the investment deflator, and real lending rates are measured by bank lending rates deflated by inflation. The identification strategy assumes block exogeneity restrictions (one external block and one domestic block), with domestic variables completely absent from equations in the external block.
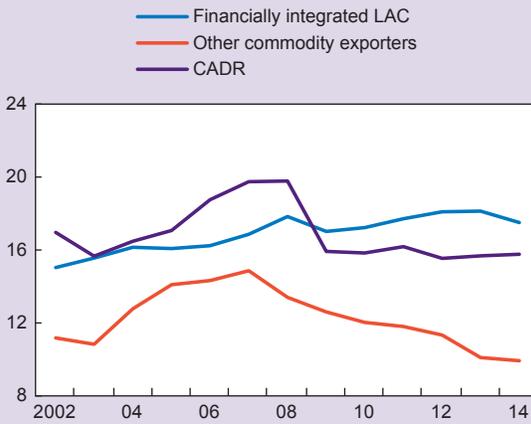
Figure 4.5

**Dynamics of Private Investment**

**Real Private Investment Growth[1]**
*(Percent change)*

- Financially integrated LAC
- Other commodity exporters
- CADR
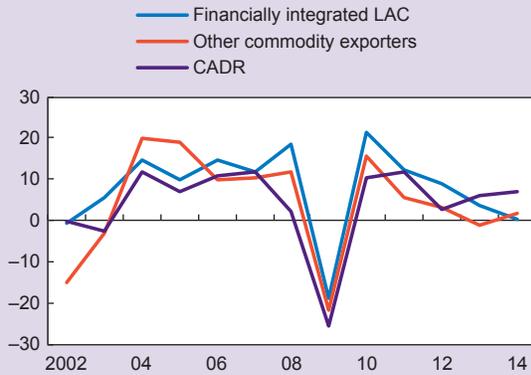
**Real Private Investment Ratios[2]**
*(Percent of real GDP)*

- Financially integrated LAC
- Other commodity exporters
- CADR

Sources: IMF, World Economic Outlook database; and IMF staff calculations.
Note: Financially integrated LAC = Brazil, Chile, Colombia, Mexico, Peru, and Uruguay; other commodity exporters = Argentina, Bolivia, Ecuador, Paraguay, and Venezuela; CADR = Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Nicaragua, and Panama.
[1] Simple average.
[2] Purchasing power parity–weighted GDP average.

Figure 4.6

**Historical Decomposition of Investment Growth**
*(Quarter-over-quarter percent change)*

- Commodity export prices
- VIX
- World GDP
- Tobin's Q
- Real effective exchange rate
- GDP
- Lending rate
- Actual

**Brazil**
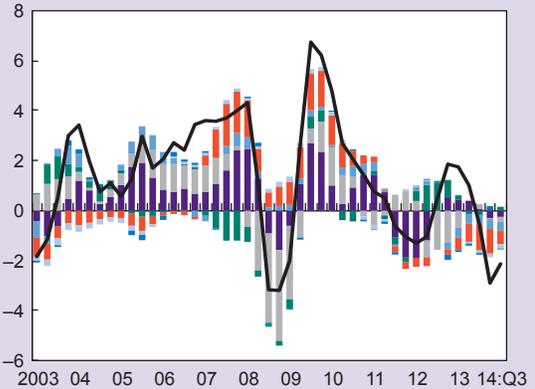
**Chile**

**Peru**
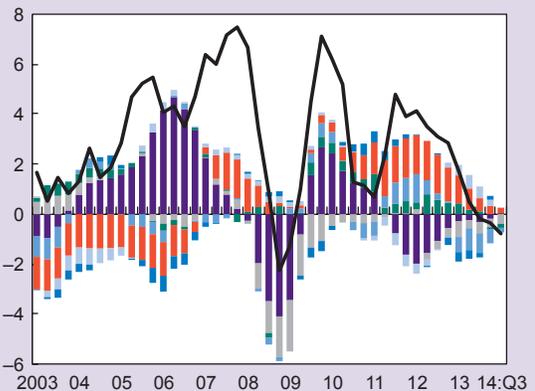
Sources: Bloomberg, L.P.; Haver Analytics; IMF, *International Financial Statistics*; and IMF staff calculations.
Note: REER = real effective exchange rate; VIX = Chicago Board Options Exchange Volatility Index.

and Peru, particularly during 2012–13 (Figure 4.6). Lower external demand has also played a significant role. In addition, recent exchange rate depreciation and, in Brazil and Chile, lower expected future profitability (as measured by Tobin's Q) have also contributed to the slowdown.[31] These results

---

[31] A real exchange depreciation tends to make capital goods more expensive, as they are to a large extent imported in these economies.

63

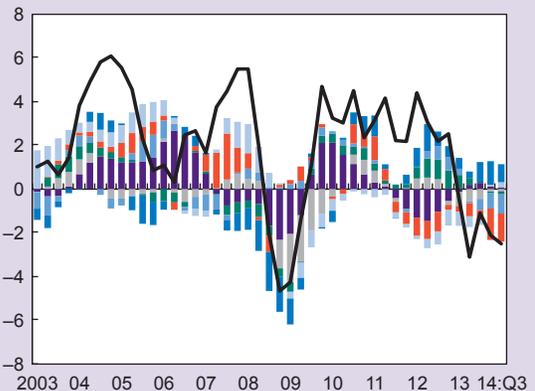are generally consistent with those obtained for investment at the firm level. Finally, the downturn in Brazil and Chile has been somewhat larger than predicted by the model, perhaps reflecting the confluence of policy uncertainty and weak private sector confidence in the case of Brazil. In Chile, uncertainty over the impact of ongoing policy reforms on the environment and the cancellation of large energy and mining projects may have been weighing on investment.

## Summary and Policy Implications

Although the investment slowdown in LAC has been consistent with historical patterns and thus does not represent a "puzzle," it is still a concern. First, prospects for a recovery of private investment are not favorable, as the outlook for most of its determinants is dim: commodity prices are expected to remain weak, capital inflows are likely to moderate, and external financial conditions are set to become tighter, including because of the normalization of U.S. monetary policy. The recent declines in potential growth estimates are also likely to be a drag on business investment going forward. Second, investment ratios remain structurally low in LAC, imposing a significant bottleneck on economic activity. Thus, boosting private investment (and saving) remains a crucial policy priority for the region. In light of this chapter's results on the importance of financing constraints, especially for smaller firms, business investment would arguably benefit from further deepening domestic financial systems, strengthening capital market development, and promoting access to finance. These goals should be subject to strict safeguards to preserve financial stability. Strengthening financial infrastructure and legal frameworks, and enhancing capital market access to small and mid-sized firms (which tend to face more severe funding constraints) would be positive measures in this regard.

More generally, although this chapter's focus lies elsewhere, there is a strong argument for tackling some of the structural weaknesses that hold back productivity and investment in LAC. As discussed

in Chapter 2, efforts should generally focus on improving infrastructure and human capital, strengthening the business climate, and fostering competition and open markets. These efforts would also support the broader objective of creating more diversified economies, as discussed in Chapter 5.
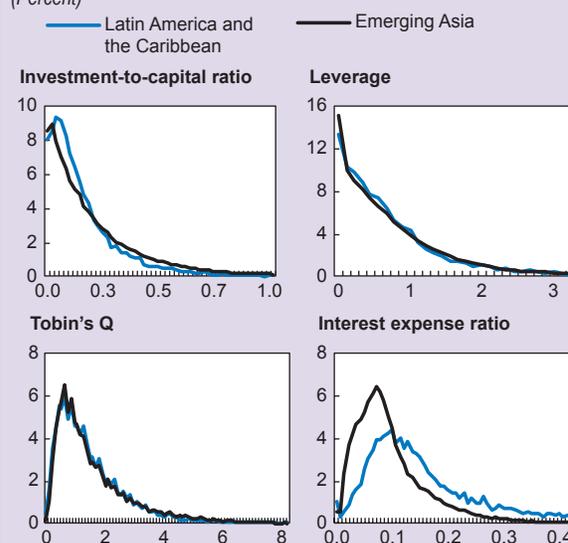
## Annex 4.1

**Table A4.1. Firm-Level Panels: List of Countries**

| Country | Number of Observations | 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 | Russia | 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 |
| | | Taiwan Province of China | 17,997 |
| Jordan | 1,538 | | |
| Kazakhstan | 223 | Thailand | 7,065 |
| South Korea | 17,245 | Turkey | 2,453 |
| Lithuania | 225 | Ukraine | 375 |
| Malaysia | 12,814 | Venezuela | 378 |
| Mexico | 2,096 | Vietnam | 3,515 |

Source: Worldscope.

Figure A4.1

**Distribution of Selected Variables**
*(Percent)*



Source: IMF staff calculations.

**Table A4.2. Extended Firm-Level Panel Regressions**

| | (1)<br>ICR | (2)<br>ICR | (3)<br>ICR | (4)<br>ICR | (5)<br>ICR | (6)<br>ICR | (7)<br>ICR |
|---|---|---|---|---|---|---|---|
| Tobin's Q | 0.0191*** | 0.0187*** | 0.0183*** | 0.0181*** | 0.0236*** | 0.0234*** | 0.0191*** |
| | (0.00435) | (0.00431) | (0.00426) | (0.00424) | (0.00276) | (0.00275) | (0.00446) |
| Cash flow | 0.00394** | 0.0113*** | −0.00210 | 0.00137 | 0.0146*** | 0.0162*** | 0.00756 |
| | (0.00189) | (0.00309) | (0.00471) | (0.00485) | (0.00214) | (0.00270) | (0.00523) |
| Leverage ($t-1$) | −0.0313*** | −0.0315*** | −0.0465*** | −0.0463*** | −0.0269*** | −0.0268*** | −0.0306*** |
| | (0.00312) | (0.00316) | (0.00405) | (0.00402) | (0.00644) | (0.00641) | (0.00305) |
| Change in debt | 0.00254*** | 0.00218** | 0.00534*** | 0.00531*** | 0.00350*** | 0.00344*** | 0.00275*** |
| | (0.000903) | (0.000893) | (0.00162) | (0.00160) | (0.00117) | (0.00118) | (0.000932) |
| Net capital inflows | 0.00243*** | 0.00239*** | 0.00233*** | 0.00232*** | 0.00222*** | 0.00221*** | 0.00210** |
| | (0.000670) | (0.000658) | (0.000684) | (0.000682) | (0.000798) | (0.000796) | (0.000975) |
| Commodity export price ($t-1$) | 0.000441*** | 0.000446*** | 0.000499*** | 0.000499*** | 0.000621*** | 0.000621*** | 0.000451*** |
| | (9.69e-05) | (9.74e-05) | (9.31e-05) | (9.29e-05) | (0.000153) | (0.000153) | (9.78e-05) |
| Size 1: Assets | 0.000437*** | 0.000641*** | | | | | |
| | (0.000154) | (0.000177) | | | | | |
| Assets × cash flow | | −1.29e-05*** | | | | | |
| | | (4.03e-06) | | | | | |
| Size 2: Gross income | | | 0.00976** | 0.0102** | | | |
| | | | (0.00460) | (0.00482) | | | |
| Gross income × cash flow | | | | −5.63e-05* | | | |
| | | | | (2.85e-05) | | | |
| Share of foreign assets holdings | | | | | 0.647*** | 1.254*** | |
| | | | | | (0.124) | (0.179) | |
| Share of foreign assets holdings × cash flow | | | | | | −0.0358*** | |
| | | | | | | (0.00460) | |
| Nontradables × cash flow | | | | | | | −0.00109 |
| | | | | | | | (0.00505) |
| Nontradables × net capital inflows | | | | | | | 0.000930 |
| | | | | | | | (0.000828) |
| Cash flow × financial account balance | | | | | | | −1.47e-05 |
| | | | | | | | (0.000252) |
| Nontradables × net capital inflows × cash flow | | | | | | | −0.00101*** |
| | | | | | | | (0.000235) |
| Constant | 9.870*** | 10.12*** | 9.206*** | 9.255*** | 7.636*** | 7.665*** | 9.458*** |
| | (0.954) | (0.967) | (1.084) | (1.088) | (0.929) | (0.913) | (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: IMF staff calculations.
Note: ICR = investment-to-capital ratio. The regressions include time effects and firm-level fixed effects. Robust standard errors (clustered by country) in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.