The global financial crisis: Explaining cross-country differences in the output impact

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ABSTRACT

What explains differences in the crisis impact across developing countries and emerging markets? Using cross-country regressions to assess the factors driving the growth performance in 2009 (compared to pre-crisis forecasts for that year), we find that a small set of variables explain a large share of the variation in the growth impact. Countries with more leveraged domestic financial systems, stronger credit growth, and more short-term debt tended to suffer a larger effect on economic activity, although the relative importance of these factors differs across country groups. For emerging markets, this financial channel trumps the trade channel. For a broader set of developing countries, however, the trade channel seems to have mattered, with more open countries affected more strongly and those exporting food commodities being less hard hit. Exchange-rate flexibility helped in buffering the impact of the shock, particularly for emerging markets. There is also some evidence that countries with a stronger fiscal position prior to the crisis were impacted less severely. We find little evidence for the importance of other policy variables.

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1. Introduction

The global financial crisis, which originated in the advanced economies, hit the rest of the world strongly, with some developing countries being particularly affected. However, the impact on economic activity varied widely across countries. A priori, this may reflect differences in exposure and vulnerability to the real and financial jitters emanating from the financial centers, but also heterogeneity in the macroeconomic and institutional frameworks as well as in the policy responses. For example, some previously crisis-prone regions, such as Latin America, have avoided big collapses, suggesting that their efforts to reduce macroeconomic and financial vulnerabilities after previous crises may have paid off. It seems, however, important to understand these issues in more detail, both for formulating the current policy response and for guiding forecasts and policy advice looking forward.

This study is one of the first attempts at explaining the differences in the crisis impact across developing countries and emerging markets. To measure the impact of the crisis, we use the difference between the 2009 growth outturns and growth forecasts made before the crisis. Using these forecasting errors allows us to bypass many otherwise difficult issues – for example, controlling for variations in growth rates that are due to differences in levels of development or cyclical positions, or other factors unrelated to the impact of the crisis. We use both descriptive evidence and cross-country regressions, exploring a broad range of explanatory variables, to gain a comprehensive picture of the key factors shaping differences in the growth impact.

We find that financial vulnerabilities evidently contributed to the severity of the growth impact. Countries with more leveraged domestic financial systems and more short-term debt tended to suffer larger losses in output. For emerging markets, this financial channel trumps the trade channel. For a broader set of developing countries, the trade channel also seems to be important, with more open countries affected more strongly.

Moreover, exchange-rate flexibility helped to buffer the impact of the shock, and countries with pegged exchange-rate regimes fared significantly worse. There is also some evidence that countries with a stronger fiscal position prior to the crisis were hit less severely, possibly because they were able to conduct countercyclical fiscal policies more effectively. We find little evidence for the importance of other policy variables.

Some other studies have looked at different aspects of the crisis impact. An early example is a note by the World Bank (2009) examining the structural factors associated with the change in actual growth in 2007 and projected growth in 2009. Given that many countries were expected to experience a slowdown even prior to the crisis, this approach does not provide a clean picture of the distribution of growth collapses attributable to the global shock. Still, some conclusions of that study—in particular regarding the role of financial vulnerabilities as well as the role of trade—are in line with ours. Berglöf et al. (2009) analyze the effects of the global financial crisis on growth in emerging Europe. Using comparisons of pre-and post crisis growth rates for a limited set of countries, they find that external debt liabilities, a decline in export volumes in Q4 2008, real effective exchange rate appreciation relative to 2002, FDI liabilities as a share of GDP, and political instability tended to add to the depth of the output declines in Q4 2008 and Q1 2009. Rose and Spiegel (2009) find no evidence that international linkages have an impact on the incidence of the crisis.[2] Subsequently to our study, various papers have investigated related issues. See in particular Blanchard et al. (2010), IMF (2010), and Lane and Milesi-Ferretti (2010). None of these studies uses forecasts to assess the degree of the crisis impact. Blanchard, Das and Faruqee and IMF (2010) focus on emerging markets. Lane and Milesi-Ferretti (2010) is the only of these studies that covers a broad sample of countries.

2. Data

While modeling the channels of transmission of the global financial crisis to emerging market countries would be beyond the scope of this paper, conceptually we envisage a small open economy

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[2] For an assessment of the role of exchange rate regime in emerging markets during and after the crisis, see Tsangarides (2010). For examples of the literature on the behavior of output during and after crises more generally, see, Cerra et al. (2009) and Gupta et al. (2003).

framework broadly similar to the ones used in the sudden-stop literature. Specifically, an economy in the "periphery" is hit by the crisis through a variety of real and financial channels. In such a framework, the short-run dynamics depend on countries' structural characteristics, their initial position and vulnerabilities, and macroeconomic policies. While the existing financial and trade linkages shape the transmission of the shock from the advanced economies, the extent to which it gets amplified in turn depends on existing domestic financial vulnerabilities and the response of monetary and fiscal policies.

2.1. Forecasting errors

To measure the impact of the global crisis on an economy's output, we compare actual GDP growth outturns in 2009 with forecasts from prior to the Lehman collapse in September 2008. In the original version of this paper, we used revisions to 2009 growth forecasts between 2008 and 2009, and found similar results.

We use two datasets of projections: *Consensus Forecasts* (an international compilation of analysts' forecasts) and the IMF's *World Economic Outlook forecasts (WEO)*. *Consensus Forecasts* data are available monthly while WEO forecasts are revised twice a year, in April and October. For the baseline analysis, we use *Consensus* growth forecast changes which has the advantage of pooling across various fore-casters and potentially suffering from less bias than the WEO.[3] We focus on the error in the average forecast for 2009 made in January through June 2008 compared to the actual outturn. The WEO database has the advantage of covering a much broader range of countries, including those with limited access to international capital markets.

2.2. Explanatory variables

We employ a wide range of variables to capture alternative transmission mechanisms. We mainly explore four broad channels: (i) trade linkages; (ii) financial linkages; (iii) underlying vulnerabilities and financial structure; and (iv) and the overall policy framework. We use 2007 values for all explanatory variables in the regressions to avoid problems of endogeneity.

The first channel is the trade channel. As the global recession caused a sharp decline in advanced economies' demand, the spillover effects are expected to be greater for developing countries with strong trade links with advanced economies. Moreover, countries exporting advanced goods appear to have suffered a sharper immediate drop in the demand for their exports than exporters of primary products. To capture various trade channels, we used three groups of variables, with variations within each set: (i) trade openness—such as exports to GDP or exports plus imports to GDP; (ii) trade composition—such as the share of commodities and manufactured products in total exports; and (iii) the direction of trade—e.g. the share of trade with advanced economies. The whole list of variables, their expected signs, and data sources are listed in Table A1.

The second channel comprises financial linkages. As the global crisis originated in the financial sector in these countries, emerging market economies with close financial ties with advance econo-mies are expected to have been affected severely. We explored various measures of financial openness, capital account restrictions, the stock of bank lending from advanced economies (relative to GDP), and the share of remittances from abroad in the economy.

The third set of variables includes various measures of underlying vulnerabilities and financial structure. Prior to the crisis, many developing countries were benefiting from favorable conditions in world markets and building up buffers against external shocks; meanwhile another group of countries entered the crisis in a riskier position. The compression of yields prior to the global financial crisis, coupled with easier access to cross-country borrowing, had fueled rapid credit growth around the world—in emerging markets, often based on foreign borrowing. When the crisis hit, capital flows reversed, and currencies depreciated. In many cases this translated into financial constraints and a collapse in credit, and in some cases into severe balance sheet problems. One would therefore presume to find that countries with high current account deficits, low reserves, high indebtedness, and strong

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[3] The correlation between consensus and WEO forecasts is very high (0.94).
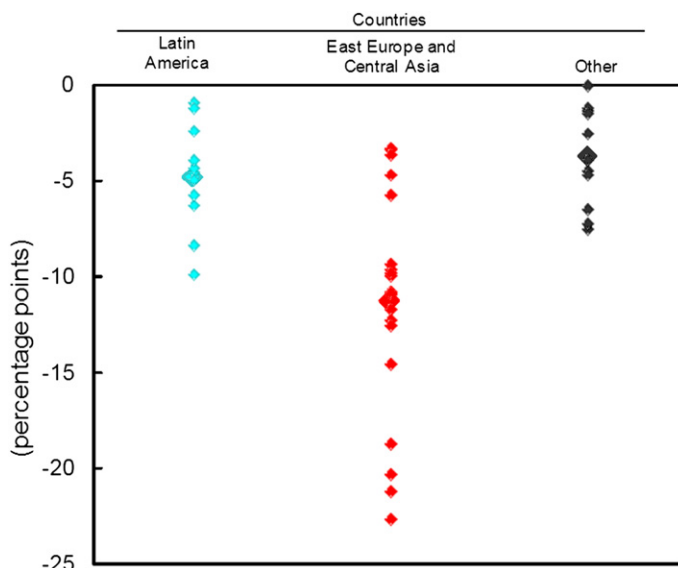
Fig. 1. Growth revisions (in percentage points).

credit growth experienced larger output collapses with the global recession. Similarly, spillovers from financial channels are expected to have been bigger for countries with complex financial structures.

The final set of variables seeks to capture the strength of the policy and institutional framework. Countries entered into the crisis with significant heterogeneity in fiscal and monetary policy setups, and we try to capture these differences by covering a broad range of variables measuring aspects of exchange rate and monetary policy, fiscal policy, and the general quality of institutions. For example, countries with more flexible exchange rates are expected to handle external shocks more easily. We also explore inflation levels, the volatility of reserves and exchanges rates, and a dummy for inflation targeting as measures of macroeconomic stability and a rules-based macroeconomic policy. Moreover, to measure a country's room for countercyclical fiscal policies, we focus on the primary fiscal gap (the difference between the actual primary balance and the balance consistent with a constant ratio of debt to GDP). Finally, we explore various other variables measuring the credibility of the macroeconomic framework and the strength of institutions.

3. Descriptive evidence

As a preliminary way of exploring the data, this section provides some descriptive, graphical evidence on the growth impact across countries. We first focus on a core sample of 43 emerging markets for which we have more complete data, and examine growth surprises using *Consensus Forecasts* data.

As is well known, the adverse growth impact for emerging markets was substantial. In this sample, the growth impact ranges from – 22.6 percentage points to +0.4 percent, with a median of −5.9 percent. The growth collapse in Eastern European and Central Asian countries stands out.[4] By contrast, the growth impact in Latin America was on average much more contained (Fig. 1).

3.1. Trade linkages

More open countries appear to have been affected more strongly by the crisis (Fig. 2). Within this sample of emerging market economies, however, there is little correlation between the share of food

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[4] The four strongest affected countries in the sample were Latvia, Ukraine, Lithuania, and Estonia. The least affected countries were China, Bolivia, Nigeria, and Egypt.
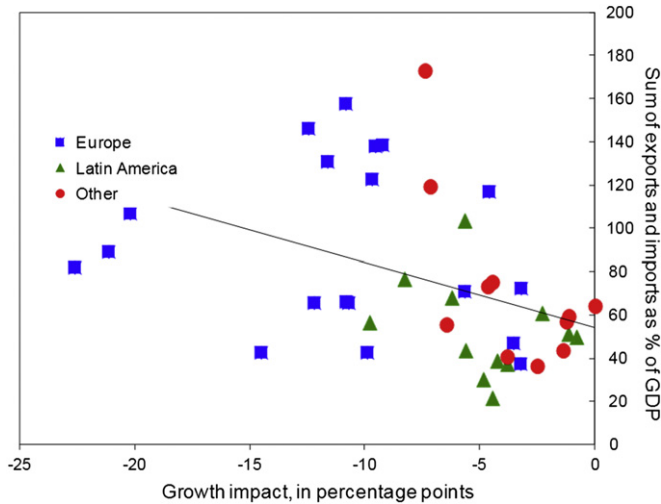
Fig. 2. Trade openness and growth impact.

commodities or manufacturing products in total exports and the growth impact. Meanwhile, among emerging market economies, those in Latin America clearly feature higher food commodity shares in their exports, which is in line with the region's relative resilience given that "soft commodity" prices held up relatively well.

3.2. Financial linkages

Countries that borrowed more from advanced economies were indeed hit harder (Fig. 3). While the top 25 percent most affected countries had liabilities to banks in advanced countries on average of about 73 percent of GDP, the 25 percent least affected countries had liabilities to advanced countries of only 19 percent of GDP. Reliance on foreign credit was particularly high in the Eastern European and Central Asian (EECA) countries, which borrowed double the amount of the other regions in 2007.

3.3. Vulnerabilities

Both leverage (as measured by the credit-to-deposit ratio) and the cumulative growth in bank credit in the period 2005–07 are clearly positively correlated with the severity of the growth impact. Among regions, EECA countries exhibited higher vulnerabilities in both regards. The average cumulative growth rate in credit in EECA countries was about four times the growth rate in other regions, and Latin America had the lowest rate (Fig. 4).

Regarding external vulnerabilities, there is also some evidence that lower current account deficits prior to the crisis were associated with better growth outcomes. The overall correlation between the current account balance and the growth outcome is positive (Fig. 5). Moreover, the top 25 percentile growth performers according to our metric on average had surpluses, and the EECA region recorded larger deficit in comparison with the other regions. The data also suggest that countries with higher international reserves tended to experience smaller adverse effects, although this relationship appears weak (Fig. 6).

3.4. Policy frameworks

Our scatter plots support the notion that more flexible exchange rates helped to buffer the shock. Countries with pegs were hit particularly strongly; on average, EECA countries had the least flexible exchange-rate regimes (Fig. 7).
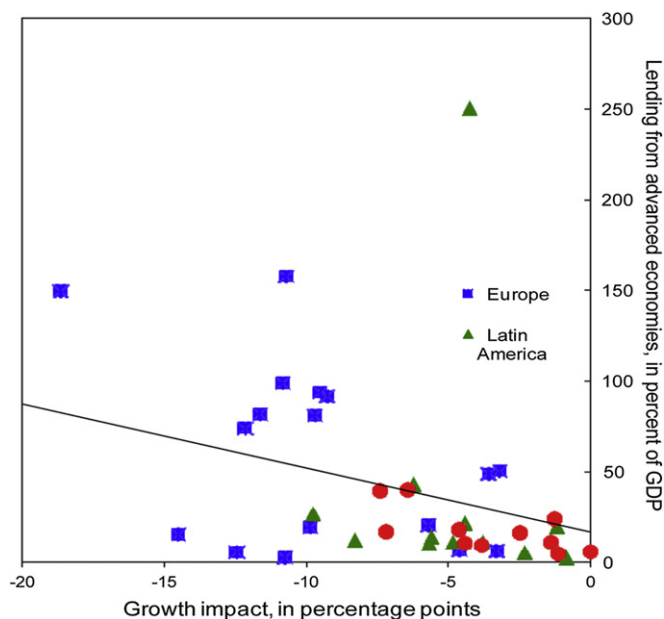
Fig. 3. Lending from advanced economies and growth impact.

Countries with significant negative growth surprises tended to feature weaker fiscal positions, as measured by the primary fiscal gap (Fig. 8). On average, Latin America exhibited the most favorable position, according to this measure. We find little correlation between institutional variables and the size of the output impact, except for corruption perceptions.[5]

4. Regression results

4.1. Regressions for emerging markets

In this section, we present our assessment of the relevance of the different factors discussed so far more formally, using cross-country regressions. Here, we use as the dependent variable the difference between the *Consensus* forecast for 2009 averaged over the January–June 2009 reports and the actual 2009 growth outcome for 40 emerging market countries.[6]

In our empirical strategy, we group all variables into the categories mentioned earlier – trade and financial linkages, vulnerabilities, and policy frameworks – and retain within each category the two to three variables that show the strongest bivariate correlations with growth outcomes. Next, we perform regressions of combinations of these variables to distil those that are robust to changes in the specifications.

In summary, we find that financial vulnerabilities—specifically the degree of leverage, the share of short-term debt, and (to a lesser extent) lending from advanced economies—as well as exchange rate policy explain a large share of the variation in the growth impact across these countries. Moreover, a strong fiscal position helped shield countries from the effect of the global financial crisis.[7]

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[5] There is a significant correlation between indices measuring institutional transparency and the extent to which financial markets were hit in the months of most pronounced global financial turbulence.

[6] See Table A2 for a list of the countries in the consensus sample.

[7] We tested all the other variables listed in Table A1, but none of them turned out to be statistically significant on a consistent basis for this sample. Interestingly, institutional variables, including institutional frameworks and the quality of policy measures, did not provide robustly significant explanatory power.
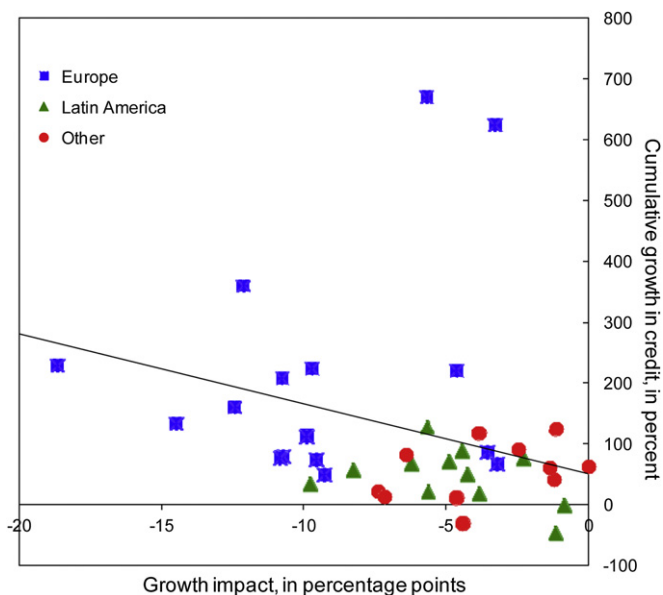
Fig. 4. Credit growth and growth impact.

Specification (1) in Table 1 is our preferred regression. For additional information, and given differences in sample size, we also show specification (2).

4.1.1. Financial linkages and vulnerabilities

The regressions confirm that for emerging markets, financial factors appear to have been key in determining the size of the growth impact of the crisis. In particular, leverage (measured as the credit-to-deposit ratio) and the share of short-term debt in GDP, turn out to be significant explanatory variables across various specifications.[8] Lending from advanced economies also enters significantly in some but not all specifications (for example, as shown in Table A3, it does not enter significantly when added to the variables in specification 1).

With a few variables, specification (1) explains close to two thirds of the variation observed in the data.

Broadly speaking, an increase in leverage of ten percentage points is associated with a reduction in growth forecasts of 0.5 percentage points (specification 1, Table 1). Put another way, if the countries in the most-levered quartile of the sample (with average leverage of 185 percent of GDP) had had the same leverage ratios as the countries in the least-levered quartile (83 percent), their 2009 growth would have been, on average, around 5 percentage points higher.

In some specifications, a currency mismatch measure, proxied by foreign assets minus foreign liabilities over GDP, enters significantly and with the expected sign (a larger currency mismatch is associated with a sharper growth impact). However, this effect is closely associated with EU countries and fixed exchange rate regimes, and when these factors are controlled for, its statistical significance disappears. Similarly, the share of foreign currency deposits among total deposits is significant in some specifications and with the expected negative sign, but the effect is weaker than for the variables above.

Many of the countries with high leverage ran sizable external current account deficits. In various specifications, the size of the current account balance is statistically significant even when the

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[8] See Table A3 for the robustness of specification (1) in Table 1 to the inclusion of additional variables.
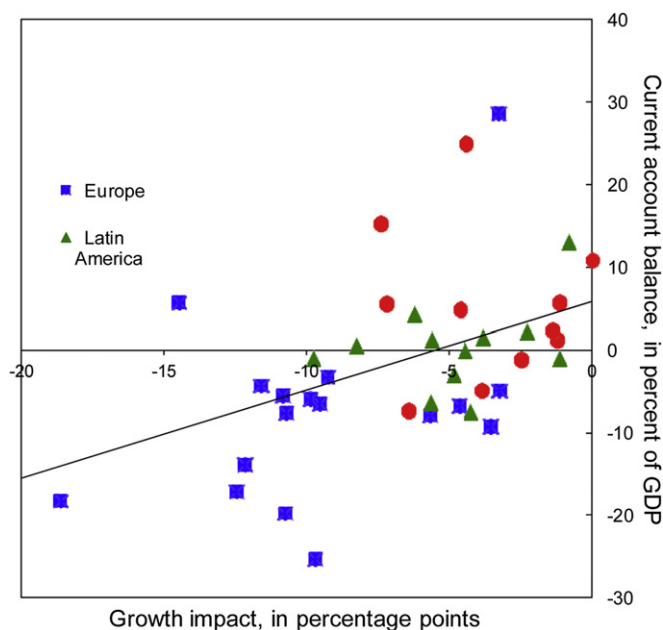
Fig. 5. Current account balances and growth impact.

exchange rate regime or net open position in foreign assets is controlled for, implying that while leverage was the crucial financial linkage, the degree of external imbalances was important.

Interestingly, the stock of international reserves—measured in numerous ways, including the share of GDP, exports, or short-term debt—did not enter in a consistent manner in our equations. This result is similar to that subsequently found by Blanchard et al. (2010) and Lane and Milesi-Ferretti (2010). This result may reflect a nonlinear relationship between international reserves and reduced vulnerabilities. The value of international reserves may diminish sharply once they move above a threshold considered sufficient to guard against risks. In fact, several of the countries experiencing the largest adverse impact, particularly in Central and Eastern Europe, had levels of international reserves similar to those prevailing in some of the less affected countries in Europe or Latin America.

4.1.2. Monetary and fiscal policy frameworks

There is somewhat stronger evidence for the importance of exchange rate and monetary policy than for fiscal policy in dampening the impact of the crisis. Among alternative monetary policy indicators, such as a dummy for inflation targeters, inflation levels, and inflation volatility, only exchange rate flexibility seems to matter.

Countries with more flexible exchange rates as measured under the IMF classification system tended to experience smaller growth declines.[9] However, the benefits of exchange rate flexibility appear limited to moving from a peg toward a more flexible regime; distinguishing between crawls and floats does not improve the fit. For this reason, the baseline specification uses a dummy variable for pegged exchange rates. In most regressions, countries with pegged exchange rates experienced, on average, a larger growth impact (close to four percentage points) compared to countries with more flexible exchange rates.[10]

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[9] See International Monetary Fund *Annual Report on Exchange Arrangements and Exchange Restrictions.*
[10] Exchange-rate pegs were defined as AREAER classifications under which the currency is pegged to a specific value rather allowed to fluctuate within a band or floating either under management or freely.
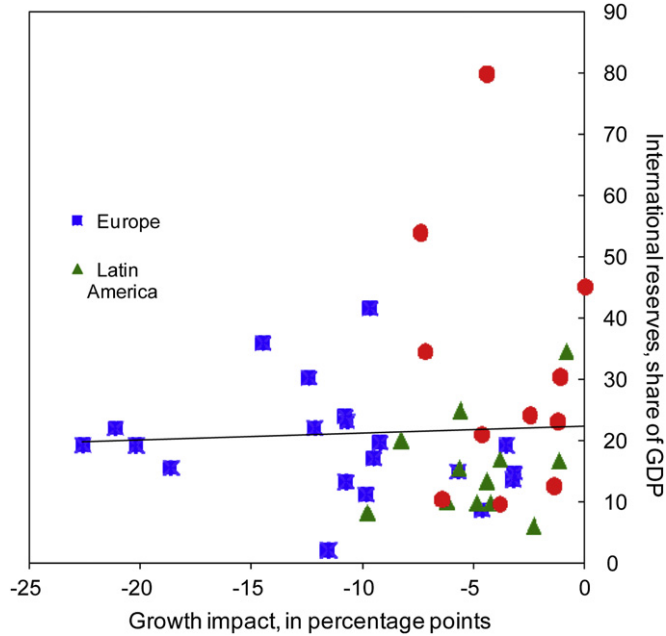
Fig. 6. International reserves and growth impact.

The primary fiscal gap is positively associated with better growth performances, in line with the notion that countries with sufficient fiscal space before the crisis were able to adopt more effective countercyclical fiscal policies during the crisis. In fact, the quartile of countries with the largest primary gaps had on average output drops that were 6.2 percentage points less negative than the quartile with
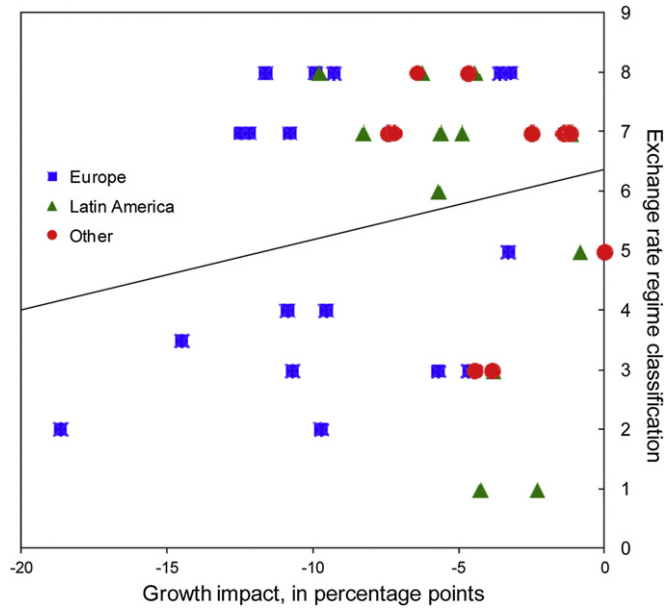
Fig. 7. De-facto exchange-rate regime and growth impact.
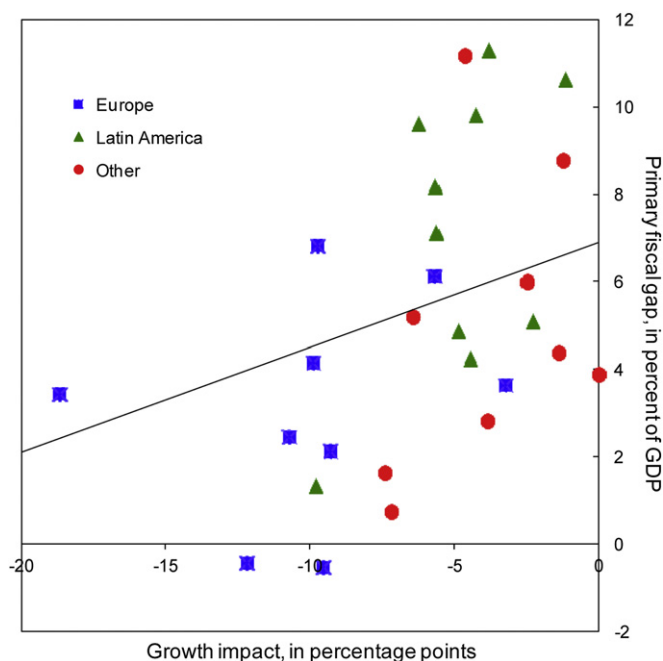
Fig. 8. Primary fiscal gap and growth impact.

the smallest primary gaps. Other fiscal variables, such as various measures of the fiscal balance or the size of the government, do not appear to matter once other factors are controlled for. Although the level of public debt enters significantly in certain specifications, it has a counterintuitive sign, associating higher debt with better growth performances. In several of the countries hit hardest by the crisis, the effect came from imbalances in the private sector—not fiscal imbalances and high public debt. Also, some of the countries that fared relatively well during the crisis had relatively high levels of public debt—in some cases combined with credible fiscal frameworks and in others with high domestic savings. In some cases, financial systems with large shares of government-controlled banks may have facilitated the build up of debt while later dampening the effects of the global credit crunch; the exploration of these issues is beyond the scope of our paper.

4.1.3. Summary

In summary, for the emerging market countries the main avenue of transmission of the shock appears to have been financial channels, particularly through high leverage and short-term debt, with the damage aggravated by pegged exchange rates. Leverage explains a substantial fraction of the

Table 1

Regression Results for Emerging Markets Dep. Variable: Actual minus forecasted 2009 GDP growth (Consensus Forecasts).

Specification	(1)	(2)
Leverage	−0.042* (0.021)	−0.052** (0.021)
Pegged ER	−3.830** (1.577)	–
Primary gap	0.472** (0.228)	–
Short-term debt/GDP	−19.233** (7.523)	−17.454** (8.372)
Lending from Adv Econ	–	−0.039* (0.022)
Constant	−1.64 (3.054)	1.85 (2.450)
No. of obs	29	33
R^2	0.67	0.55

Standard errors in parentheses.

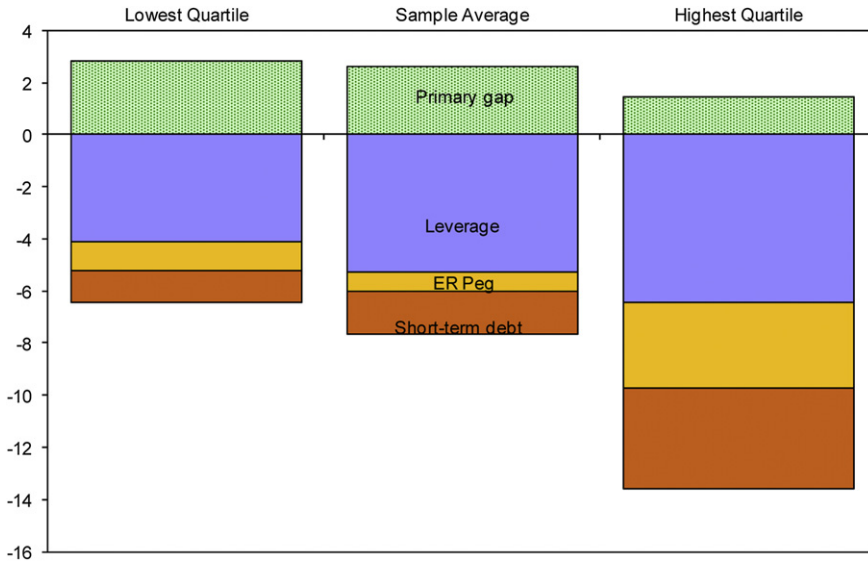[***]$p < 0.01$, [**]$p < 0.05$, [*]$p < 0.1$.

Fig. 9. Decomposing the Growth Impact for Emerging Markets (Based on Equation (1)).

growth impact across strongly and less strongly affected countries. The share of short-term debt in GDP explains a considerable share of the growth surprise for the average country as well as those most affected. Limited exchange rate flexibility also explains a significant share of the growth impact of the most affected countries (Fig. 9).

4.2. Did trade linkages play a role? Regressions for a broader set of developing countries

We also estimate regressions with the WEO forecast dataset to examine the growth impact for 121 countries, including low-income as well as emerging market countries, and to explore whether other channels, such as trade linkages, mattered for a broader set of countries.

Interestingly, the trade channel appears to matter in this sample. The degree of trade openness enters with a negative, statistically significant coefficient across specifications.[11] Quantitatively, a ten-percentage-point increase in a country's sum of exports and imports as a share of GDP is associated with 2–3 percentage-point lower growth performance in 2009. There is some evidence that the composition of trade makes a difference. In particular, the share of manufacturing products in total exports is correlated with worse growth performance. This is consistent with the notion that countries exporting manufacturing goods to advanced countries seem to have been hit hard by the decline in demand from these markets, while countries exporting food appear to have fared better. However, the trade channel appears to have worked differently for emerging markets: regressions with interaction terms with a dummy for emerging markets indicate that higher "soft commodity" shares are not associated with better growth performances for emerging markets, while the share of manufacturing mattered only for emerging markets.

Financial vulnerabilities also have a statistically significant effect on the growth impact in this sample, with leverage and the cumulative credit growth prior to the crisis associated with a stronger crisis impact.[12] However, exchange rate flexibility appears to be less important. We also found some indication that in this sample, political stability mattered for the strength of the crisis impact, but the effect is not consistently robust across specifications. (Table 2)

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[11] See Lane and Milesi-Ferretti (2010) for a similar finding.

[12] Some of the variables used in Table 1, such as the share of short-term debt in total debt, were not included in the regression, as they were not available for a large set of countries. Leverage ceased to be statistically significant when excluding the Baltic countries.

Table 2

Regression Results: All Developing Countries Dependent Variable: Actual minus forecasted 2009 GDP growth (WEO Forecasts).

	(1)	(2)	(3)	(4)
Trade openness	−0.022** (0.009)	−0.021* (0.011)	−0.025** (0.011)	−0.020* (0.010)
Share of "soft" commodities in total exports			0.049* (0.026)	
Cum. Credit Growth	−0.011*** (0.003)	−0.014*** (0.003)	−0.012*** (0.003)	−0.014*** (0.003)
Leverage	−0.024*** (0.009)	−0.027** (0.012)	−0.031** (0.012)	−0.018 (0.012)
Share of manufacturing in total exports		−0.031* (0.016)		−0.005 (0.018)
Share of "soft" com. in total exp. × EM dummy			−0.078** (0.034)	
Share of manufact. in total exp. × EM dummy				−0.048*** (0.017)
Constant	0.321 (1.223)	1.894 (1.594)	0.770 (1.610)	0.814 (1.584)
Observations	121	86	86	86
R^2	0.24	0.34	0.36	0.39

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

Table 3

Robustness Tests: Changing Dates Dep. Var.: Actual minus forecasted 2009 GDP growth (Consensus Forecasts, Emerging Markets).

	(1)	(2)	(3)	(4)
	Using April 08 Forecasts		Using Aug 08 Forecasts	
Leverage	−0.042* (0.021)	−0.054** (0.021)	−0.028 (0.021)	−0.042* (0.021)
Pegged ER	−3.959** (1.569)		−3.818** (1.580)	
Primary Gap	0.468** (0.226)		0.504** (0.228)	
Short-term debt/GDP	−20.432** (7.489)	−18.396** (8.449)	−18.042** (7.538)	−15.643** (8.466)
Lending from Adv. Econ.		−0.038* (0.023)		−0.038* (0.023)
Constant	−1.458 (3.039)	2.162 (2.473)	−3.207 (3.059)	0.798 (2.477)
No. of obs.	29	33	29	33
R^2	0.68	0.56	0.62	0.48

Standard errors in parentheses.
***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

5. Robustness tests

The results are largely robust to changes in the dates of the *Consensus Forecasts* data used. Moving from the average to April or to August does not make much difference. Although leverage loses its statistical significance in one specification, its economic magnitude remains similar. (Table 3)

We also ran regressions with WEO forecasts using the same set of countries that we used for the *Consensus Forecasts* sample. The basic results are the same. (Table 4)

We further explored the robustness of the main specifications to the inclusion of additional variables. These are shown in Table A3 and A4. The results remain basically unaltered.

Lastly, given that the Baltic countries were among the strongest hit, and given that they share various common features, we examined how the regression results were affected when excluding them.[13] Clearly, in the small sample of emerging markets, this makes inference more difficult as the sample size shrinks further and we lose cross-country variation. Still, while the statistical significance of the results is weakened somewhat, they remain largely unaltered. Leverage loses its significance in specification (1) from Table 1 and short-term debt is no longer statistically significant in specification (2) (Table A5), but coefficient sizes remain broadly the same. The results for the broader sample of

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[13] We exclude Estonia, Latvia, and Lithuania.

Table 4
Robustness Tests – Using WEO forecasts for EM sample Dep. Var.: Actual minus forecasted 2009 GDP growth.

	(1)	(2)
Leverage	−0.03* (0.020)	−0.046** (0.022)
Pegged ER	−4.173** (1.900)	
Primary gap	0.483** (0.180)	
Short-term debt/GDP	−14.281** (6.401)	−13.234** (6.131)
Lending from Adv. Econ		−0.031* (0.016)
Constant	−3.175 (2.356)	0.492 (2.525)
No. of obs.	29	33
R^2	0.63	0.43

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

developing countries remain qualitatively unchanged, with the exception of the leverage variable, which is no longer statistically significant (Table A6). This reflects the fact that the ratio of lending to deposits was indeed much higher in the Baltic countries than in most other countries. Our sample does not allow us to answer with certainty whether this reflects a true casual vulnerability or whether it is an artifact of the data.

6. Conclusion

The results of this paper show that a relatively small set of variables can explain much of the difference in countries' prospects after the financial crisis intensified in September 2008. A simple specification explains two thirds of the variation in the growth impact. Despite the inherent limitations of the exercise, these results are robust across a wide variety of specifications and country samples. While financial factors were strongly associated with the crisis impact, there is also some evidence that trade linkages played a role in the transmission of the crisis, especially for non-emerging market developing countries.

This attempt to explain why some developing countries and emerging markets fared better than others suggests drawing some—preliminary—policy lessons:

- Reliance on short-term debt should be avoided as it is associated with higher vulnerability; similarly, the evidence from this crisis is consistent with the lessons learned about the dangers associated with strong credit booms;
- Exchange-rate flexibility proved important for emerging markets in dampening the impact of large shocks;
- A solid fiscal position during "good times" creates a buffer to conduct countercyclical fiscal policies after adverse shocks.

However, as more data become available and the global economy enters a recovery, more research will be needed to understand in greater detail the effect of policy responses and other institutional and structural factors on the duration of recessions in each country and the speed and size of the recovery in economic activity.

Appendix

Table A1
List of Explanatory Variables.

Category	Exp. Sign	Source
Trade linkages		
Trade openness	–	IMF – Direction of Trade and WEO
Share of total exports in GDP	–	World Economic Outlook
Share of exports to advanced economies in GDP	–	IMF – Direction of Trade and WEO
Share of exports to US in GDP	–	IMF – Direction of Trade and WEO
Share of manufacturing products in total exports	–	World Trade Organization
Share of food commodities in total exports	+	World Trade Organization
Share of non-fuel commodities in total exports	+	World Trade Organization
Share of non-fuel commodities in GDP	+	World Trade Organization
Share of advanced manufacturing in GDP	–	World Trade Organization and World Economic Outlook
Change in export volumes in 2008	–	World Economic Outlook
Change in growth forecasts for trading partners	+	World Economic Outlook
Financial linkages		
Stock of bank lending from advanced economies as a share of GDP	–	Bank for International Settlements and World Economic Outlook
Stock of bank lending from U.S. as a share of GDP	–	Bank for International Settlements and World Economic Outlook
Financial integration measures (capital account restriction indices for both inflows and outflows)	–	Schindler (2009), "Measuring Financial Integration: A New Data Set" IMF Staff Papers, Vol. 56, No. 1, pp. 222–238. Available at http://www.palgrave-journals.com/imfsp/journal/v56/n1/abs/imfsp200828a.html
Received remittances as a share of GDP	–	BOPS/IIP Balance of Payments and International Investment Position Statistics – WEO
Net remittances as a share of GDP	–	BOPS/IIP Balance of Payments and International Investment Position Statistics – WEO
Foreign assets and liabilities as a share of GDP	–	Balance of Payments Statistics and World Economic Outlook
Vulnerabilities/financial structure		
Stock of international reserve assets as a share of GDP, as share of external debt, as share of exports of goods and services	+	World Economic Outlook
Domestic credit/domestic deposits (leverage)	–	International Financial Statistics- Monetary Survey
Cumulative credit growth 2003–2007	–	International Financial Statistics- Monetary Survey
Public debt as share of GDP	–	World Economic Outlook
Overall balance to GDP	+	World Economic Outlook
Current account balance as a share of GDP	+	World Economic Outlook
National savings to GDP	+	World Economic Outlook
Investment to GDP	–	World Economic Outlook
Inflation	–	World Economic Outlook
Degree of financial sophistication	–	The Global Competitiveness Report 2007–08 (page 468)
General government overall balance as percent of GDP	–	World Economic Outlook
ICRG risk indices for political, financial, economic, and overall country risk	–	International Country Risk Guide, The PRS Group
Opacity Index	–	Milken Institute
CDS and EMBI spreads	–	Datastream
Institutional investors credit rating	+	Institutional Investors
Foreign assets minus foreign liabilities as a share of GDP	–	Balance of Payments Statistics and World Economic Outlook
Policy framework		
Degree of exchange-rate flexibility	+	International Monetary Fund, 2009, Exchange Arrangements and Exchange Restrictions 2008.
Inflation targeting dummy	+	IMF–MCM
Primary gap	+	The Vulnerability Exercise for Emerging Markets, IMF.
Structural balance	+	World Economic Outlook
Transparency International corruption perceptions	+	Transparency International
Transparency of economic policymaking	+	The Global Competitiveness Report 2007–08 (page 385)
Opacity Index	–	Milken Institute
Country Policy and Institutional Assessment Rate	–	World Bank

Table A2. Countries Considered for Forecast.

Table A2.1
Countries Considered from Consensus Forecast.

Albania	Croatia	Lithuania	Romania
Argentina	Czech Republic	Malaysia	Russia
Azerbaijan, Rep. of	Ecuador	Mexico	Saudi Arabia
Belarus	Egypt	Moldova	Slovak Republic
Bolivia	Estonia	Nigeria	Slovenia
Brazil	Georgia	Pakistan	South Africa
Bulgaria	Hungary	Panama	Thailand
Chile	India	Paraguay	Turkey
China,P.R.: Mainland	Indonesia	Peru	Ukraine
Colombia	Kazakhstan	Philippines	Uruguay
Costa Rica	Latvia	Poland	

Table A2.2
Countries considered from WEO database.

Afghanistan, I.R. of	Czech Republic	Lebanon	Senegal
Albania	Djibouti	Libya	Seychelles
Algeria	Dominica	Lithuania	Sierra Leone
Angola	Dominican Republic	Macedonia, FYR	Slovak Republic
Antigua and Barbuda	Ecuador	Madagascar	Slovenia
Argentina	Egypt	Malawi	Solomon Islands
Armenia	El Salvador	Malaysia	South Africa
Azerbaijan, Rep. of	Equatorial Guinea	Maldives	Sri Lanka
Bahamas, The	Estonia	Mali	St. Kitts and Nevis
Bahrain, Kingdom of	Ethiopia	Mauritania	St. Lucia
Bangladesh	Fiji	Mauritius	St. Vincent & Grens.
Barbados	French Polynesia	Mexico	Sudan
Belarus	Gabon	Moldova	Suriname
Belize	Gambia, The	Mongolia	Syrian Arab Republic
Benin	Georgia	Morocco	Tajikistan
Bolivia	Ghana	Mozambique	Tanzania
Bosnia & Herzegovina	Grenada	Myanmar	Thailand
Brazil	Guatemala	Nepal	Togo
Brunei Darussalam	Guinea	Nicaragua	Tonga
Bulgaria	Guinea-Bissau	Niger	Trinidad and Tobago
Burkina Faso	Guyana	Nigeria	Tunisia
Burundi	Haiti	Oman	Turkey
Cambodia	Honduras	Pakistan	Turkmenistan
Cameroon	Hungary	Panama	Uganda
Cape Verde	India	Papua New Guinea	Ukraine
Central African Rep.	Indonesia	Paraguay	United Arab Emirates
Chad	Iraq	Peru	Uruguay
Chile	Jamaica	Philippines	Uzbekistan
China, P.R.: Mainland	Jordan	Poland	Vanuatu
Colombia	Kazakhstan	Qatar	Venezuela, Rep. Bol.
Comoros	Kenya	Romania	Vietnam
Congo, Dem. Rep. of	Kiribati	Russia	Yemen, Republic of
Congo, Republic of	Kuwait	Rwanda	Zambia
Costa Rica	Kyrgyz Republic	Samoa	
Côte d'Ivoire	Lao People's Dem. Rep	São Tomé & Príncipe	
Croatia	Latvia	Saudi Arabia	

Table A3
Robustness of Regression for Emerging Markets to Inclusion of Further Variables.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Leverage	−0.041*	−0.037	−0.037	−0.039*	−0.047**	−0.059**	−0.040*	−0.040*	−0.042*	−0.042*
	(0.021)	(0.023)	(0.022)	(0.021)	(0.022)	(0.023)	(0.022)	(0.022)	(0.021)	(0.021)
Pegged ER	−3.871**	−4.352**	−4.071**	−3.521**	−4.164**	−3.788**	−3.535*	−4.046**	−4.249**	−3.799**
	(1.598)	(1.802)	(1.628)	(1.629)	(1.657)	(1.529)	(1.814)	(1.667)	(1.629)	(1.622)
Primary gap	0.422*	0.492**	0.499**	0.402	0.491**	0.409*	0.456*	0.403	0.622**	0.467*
	(0.243)	(0.233)	(0.233)	(0.244)	(0.231)	(0.224)	(0.236)	(0.273)	(0.271)	(0.234)
Short-term debt/GDP	−17.674**	−17.574**	−17.388**	−16.745*	−22.882**	−13.990*	−18.669**	−18.813**	−22.751**	−19.678**
	(8.001)	(8.070)	(8.029)	(8.126)	(9.101)	(8.003)	(7.834)	(7.702)	(8.276)	(8.171)
Trade Openness	−0.015									
	(0.023)									
TI Corruption Index		−0.405								
		(0.647)								
ICRG Political Risk			−0.070							
			(0.098)							
Lending from Adv Econ				−0.020						
				(0.024)						
Current Account Balance as % of GDP					−0.093					
					(0.128)					
International Reserves as % of GDP						−0.123				
						(0.077)				
Cum. credit growth							−0.002			
							(0.006)			
Share of Manufacturing in total Exp.								−0.018		
								(0.038)		
Foreign Asset and Liabilities as % of GDP									0.035	
									(0.034)	
Gross national savings as % of GDP										−0.019
										(0.118)
Constant	−0.548	−0.726	2.296	−1.193	−0.979	2.724	−1.648	−0.523	−3.164	−1.111
	(3.532)	(3.419)	(6.305)	(3.118)	(3.214)	(4.032)	(3.112)	(3.903)	(3.400)	(4.537)
Observations	29	29	29	29	29	29	29	29	29	29
R^2	0.67	0.67	0.67	0.68	0.67	0.70	0.67	0.67	0.68	0.67

Standard errors in parentheses.
***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table A4
Robustness of Regression for Broader Set of Countries to Inclusion of Other Variables.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Trade openness	−0.022** (0.011)	−0.020* (0.012)	−0.022* (0.012)	−0.024** (0.011)	−0.024* (0.013)	−0.026** (0.011)	−0.025** (0.011)	−0.023* (0.013)
Share of "soft" commodities in total exports	0.062*** (0.017)	0.043** (0.019)	0.034* (0.019)	0.059*** (0.018)	0.055** (0.024)	0.048** (0.019)	0.049*** (0.017)	0.046*** (0.017)
Share of "soft" commodities in total exports × EM dummy	−0.085*** (0.024)	−0.073*** (0.026)	−0.064** (0.028)	−0.082*** (0.024)	−0.084*** (0.028)	−0.077*** (0.025)	−0.078*** (0.023)	−0.076*** (0.024)
Cumulative credit growth	−0.012** (0.005)	−0.014*** (0.005)	−0.013** (0.005)	−0.013** (0.005)	−0.012** (0.005)	−0.012** (0.005)	−0.012** (0.005)	−0.012** (0.005)
Leverage	−0.027** (0.013)	−0.027** (0.013)	−0.028* (0.014)	−0.030** (0.013)	−0.035** (0.015)	−0.031** (0.013)	−0.031** (0.013)	−0.032** (0.013)
Current account balance as % of GDP	0.047 (0.048)							
TI Corruption Index		−0.494 (0.325)						
ICRG Political Risk			−0.093** (0.045)					
Gross national savings as % of GDP				0.042 (0.053)				
Foreign assets + liabilities as % of GDP					−0.011 (0.013)			
ER Peg dummy						0.168 (1.028)		
Lending from adv. Economies							−0.000 (0.001)	
International Reserves as % of GDP								−0.021 (0.055)
Constant	0.097 (1.760)	1.940 (1.854)	6.507** (2.865)	−0.453 (2.173)	1.492 (1.909)	0.723 (1.736)	0.762 (1.723)	1.236 (1.789)
Observations	86	84	74	86	67	86	86	86
R^2	0.37	0.37	0.37	0.36	0.37	0.36	0.36	0.36

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

Table A5

Robustness Tests - Excluding the Baltic Countries Dep. Var.: Actual minus forecasted 2009 GDP growth (Consensus).

	(1)	(2)
Leverage	−0.033 (0.026)	−0.046* (0.024)
Pegged ER	−2.899* (1.654)	–
Primary Gap	0.419* (0.231)	–
Short-term debt/GDP	−23.175** (10.727)	−20.260 (12.593)
Lending from Adv. Econ.	–	−0.025 (0.027)
EU Accession Dummy	–	–
Constant	−2.079 (3.876)	1.148 (3.162)
Observations	26	30
R^2	0.44	0.27

Standard errors in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A6

Excluding the Baltics – Results for all developing countries Dependent Variable: Actual minus forecasted 2009 GDP growth (WEO Forecasts).

	(1)	(2)	(3)	(4)
Trade openness	−0.019** (0.008)	−0.018* (0.009)	−0.022** (0.010)	−0.017* (0.009)
Share of "soft" commodities in total exports			0.044** (0.017)	
Share of "soft" commodities in total exports × EM			−0.071*** (0.024)	
Cumulative credit growth	−0.010*** (0.003)	−0.012*** (0.004)	−0.011** (0.004)	−0.012*** (0.004)
Leverage	−0.014 (0.011)	−0.012 (0.012)	−0.015 (0.012)	−0.004 (0.011)
Share of manufacturing in total exports		−0.027** (0.013)		−0.004 (0.017)
Share of manufacturing in total exports × EM				−0.043** (0.016)
Constant	−0.790 (1.519)	−0.091 (1.605)	−1.041 (1.628)	−0.937 (1.517)
Observations	118	83	83	83
R^2	0.16	0.23	0.25	0.29

Robust standard errors in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

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