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How resilient and countercyclical were emerging economies during the global financial crisis?

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A B S T R A C T

By studying the cross-country incidence of the 2008–2009 global financial crisis, we document a structural break in the way emerging economies responded to the global shock. Contrary to popular perceptions, emerging economies suffered growth collapses (relative to the pre-crisis levels) comparable to those experienced by developed economies, even when they continued growing. Afterwards, most economies returned to their pre-crisis growth rates. Although emerging economies were not able to avoid the collapse originated in the U.S. and then transmitted across countries, they were more resilient during the global crisis than during past crises. Namely, they resumed their higher growth rates earlier and converged more quickly to their pre-crisis growth trend. Moreover, breaking with the past, emerging economies did not fall more than developed economies during the global crisis and were able to conduct countercyclical policies, thus becoming more similar to developed economies.

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1. Introduction

In this paper, we document the extent to which emerging market economies were resilient to the 2008–2009 global financial crisis. We interpret resilience from both an *ex ante* and *ex post* perspective. From an *ex ante* point of view, resilience means that economies have a lower likelihood of being affected by an external shock. From an *ex post* perspective, it means a better recovery when there are contagion or spillover effects from external crises. We relate the behavior of emerging economies during the global crisis to the crisis transmission mechanisms (trade and finance) and a structural break in the way they conducted their policies. We describe some of the factors that might have facilitated (or hindered) the global transmission of the crisis and analyze the policies emerging economies adopted to become more resilient to crises.

We question the usual claim that, on impact, emerging market economies suffered less than advanced economies in terms of economic activity.² Even though emerging economies had a better performance when focusing on plain growth rates, the conclusions change when considering changes in growth rates relative to the pre-crisis growth rates. Emerging economies endured declines in real gross domestic product (GDP) growth comparable to those in advanced economies. Nonetheless, emerging economies were able to avoid the amplification of external shocks that were typical of past episodes that tended to end up in banking, currency, and/or debt crises. During the recovery phase, emerging economies were more resilient. At first sight, GDP data suggest that emerging economies recovered similarly to developed economies, with most economies rebounding during the crisis aftermath according to how much they collapsed. Yet, higher-frequency industrial production (IP) data suggest that emerging economies did recover more strongly than advanced economies. Still, there was significant heterogeneity among emerging economies, with Eastern Europe and Central Asia faring the worst. Overall, low-income economies were more isolated from the global shock.

Our findings put in perspective the concept of resilience to crises and how the arguments in the literature square with the evidence. The popular perception is that emerging economies fared, on average, substantially better than advanced economies during the 2008–2009 global crisis (Eichengreen, 2010). Researchers justify this claim by presenting evidence of a negative association between some indicators of economic performance around the crisis and the level of GDP per capita (Claessens et al., 2010; Frankel and Saravelos, 2010; Lane and Milesi-Ferretti, 2010; Rose and Spiegel, 2010, 2011, *in press*; Rose, 2011).

Our results differ from those in the literature for at least two reasons. First, when using GDP growth as an indicator of economic performance (as in Frankel and Saravelos, 2010; Rose and Spiegel, 2010, 2011, *in press*; Rose, 2011), it is true that advanced economies attained lower rates of GDP growth during the crisis. This measure, however, could be capturing that advanced economies grow slower on average than emerging economies independent of any crisis event. In contrast, the analysis of *collapses* in GDP growth suggests that, on impact, the crisis was not more severe in advanced economies. Second, although other studies measure crisis incidence in terms of changes in GDP growth (Blanchard et al., 2010; Claessens et al., 2010; Lane and Milesi-Ferretti, 2010), we identify a non-linearity between the collapse in GDP growth and GDP per capita that was ignored in those studies. Collapses in GDP growth around the global crisis did not increase monotonically with GDP per capita. Instead, the largest collapses in GDP growth occurred at income levels corresponding to those of the wealthier emerging economies and poorer high-income economies.

The analysis of high-frequency IP data is also important because the timing of the collapse and the recovery does not coincide with the calendar year and because it suggests that the post-crisis is one area where emerging economies displayed better performance. In particular, emerging economies

² Our data are comprised of 183 economies, classified as “advanced” (or “developed”) if they fall under the World Bank’s July 2010 classification of “high-income” economies. All others are “developing economies.” Within the latter, economies are classified as “emerging” if they have access to loans from the World Bank (IBRD) and as “low-income” if they only have access to funds from IDA (the World Bank’s branch that focuses on the poorest nations). Economies not falling under the “advanced economies” group are assigned to regions according to the World Bank’s July 2010 classification. The region “Middle East and Africa” includes economies in the Middle East and North and Sub-Saharan Africa. The region “Asia” includes economies in East Asia, South Asia, and the Pacific.

were typically under recessionary pressures for a fewer number of months than advanced economies. For example, by December 2010, IP in emerging economies had returned to its geometric trend, whereas in advanced economies it was still more than 13 percentage points below trend. This analysis of the post-crisis period complements the growing literature on the 2008–2009 global crisis that has concentrated mainly on the collapse and has typically analyzed low frequency GDP measures.

We conjecture that at least four factors are important in understanding the differentiated post-crisis behavior of emerging economies relative to advanced economies. The first and most obvious one is that the root of the problem was in the financial markets of the advanced economies, and emerging economies had a low exposure to these markets relative to other developed economies. The second reason is linked to the fact that, to the extent that there is a convergence process, emerging economies typically grow at a higher pace than advanced economies. Therefore, a recovery of their growth trajectory would make emerging economies' output converge to the pre-crisis level sooner.

The third reason is related to international trade. As the U.S. economy came to a standstill in late 2008, firms anticipated an accumulation of inventories and stopped their international orders.³ This generated a collapse in production in several emerging economies focused on supplying manufactures to the world. As inventories decreased, and it became more likely that global demand would stabilize, firms reignited their production and overall economic activity in emerging markets expanded. Thus, emerging economies were able to generate a faster recovery than developed economies, for which manufacturing accounts for a smaller share of GDP.

The fourth reason is a fundamental change in the way emerging economies conducted their policies relative to the past. Historical evidence suggests that emerging economies usually lack the policy tools to deal with external shocks that are available to advanced economies. Previous worldwide turbulent episodes found most emerging economies unable to perform countercyclical policies. In many cases, their own vulnerabilities and poor institutional frameworks amplified negative external shocks leading to sharper recessions.⁴ In contrast, we document a structural break in the way emerging economies conduct their policies, with more countercyclical policies pursued before and during the global crisis. The global crisis found many emerging economies with more fiscal space, better domestic balance sheets, and the required credibility to conduct expansionary fiscal and monetary policies. In sum, the resilience of emerging economies to the 2008–2009 crisis might be partly attributed to a combination of sounder macroeconomic and financial policy frameworks with a shift towards safer domestic and international financial stances. Frankel et al. (2011), Gourinchas and Obstfeld (2012), and Kose and Prasad (2010) make similar points from other angles.

Regarding the financial stance, emerging economies have, on average, made an effort to reduce the credit risk embedded in debt contracts as well as currency and maturity mismatches. On the external front, emerging economies became net creditors to the rest of the world as regards debt contracts while increasing their net debtor position as regards equity contracts. On the domestic front, several emerging economies extended the maturity profile of their debt and increased the relative size of domestic currency debt during the 2000s. The changes in the profile of their debt structures might have reduced the downside risks of financial integration. In the past, the exchange-rate depreciations typically observed around financial crises tended to increase the burden of foreign-currency debt that, coupled with high levels of short-term debt, led to rollover crises. In contrast, the exchange-rate devaluations observed during 2008 and 2009 implied an improvement in the external positions of emerging economies (measured in domestic currency) due to their net creditor stance. Lower currency and maturity mismatches also helped absorb the shock. Furthermore, as world equity prices

³ For example, Alessandria et al. (2010, 2012) document a large inventory adjustment in the U.S. automobile sector during the crisis.

⁴ For instance, the absence of access to world capital markets during turbulent times has hampered the ability of governments to raise funds and conduct countercyclical fiscal policies (Reinhart and Reinhart, 2008; Broner et al., in press). In addition, emerging economies usually follow procyclical policies during both good and bad times (Kaminsky et al., 2004a; Talvi and Vegh, 2005; Hutchinson et al., 2010).

plummeted, the external liability was reduced and the net debtor equity position shrank.⁵ These shifts in the domestic and international fronts might have also helped financially globalized emerging economies avoid the domestic amplification of the external shock. As a result, most emerging economies came out of the crisis with strong balance sheets. In contrast, advanced economies saw their recovery hampered by impaired balance sheets in financial intermediaries, households, and the public sector.

The rest of this paper is organized as follows. Section 2 describes the cross-country incidence of the crisis and the post-crisis recovery. Section 3 examines the transmission channels and provides an econometric analysis of the correlates of growth collapses and recoveries. Section 4 discusses the policy responses to the 2008–2009 crisis. Section 5 concludes.

2. Performance during the 2008–2009 crisis

2.1. Performance during the downturn

The 2008–2009 global crisis was one of the broadest, deepest, and most complex crises afflicting the world since the Great Depression (Almunia et al., 2009). The crisis originated in the relatively small U.S. subprime housing market, which represented about 15 percent of U.S. total residential mortgages in 2006. The latter, in turn, accounted for 25 percent of U.S. total debt (Agarwal and Ho, 2007). But after the Lehman Brothers' collapse in September 2008, the crisis quickly spread across institutions, markets, and borders. There were massive failures of financial institutions and a collapse in asset values. For example, stock markets around the world fell over 30 percent between September and December 2008, and about 18 trillion U.S. dollars in G-7 stock market capitalization vanished. These developments in the financial markets marked the end of the boom years of the mid-2000s. Moreover, while real world GDP grew, on average, at 3 percent between 2000 and 2008, real world GDP contracted 1.9 percent in 2009.

Although highly synchronized during this downturn, the behavior of real GDP growth was heterogeneous across economies. Research suggests that emerging economies performed substantially better than advanced economies during this phase of the crisis. In general, the evidence shows that economies with higher GDP per capita experienced lower GDP growth (Claessens et al., 2010; Frankel and Saravelos, 2010; Lane and Milesi-Ferretti, 2010; Rose and Spiegel, 2010, 2011, in press). For instance, in 2009 emerging economies and low-income economies grew, on average, 0.9 and 4.8 percent, respectively; whereas the growth rate observed across advanced economies was significantly lower at –3.6 percent (Table 1).⁶ Moreover, there was substantial heterogeneity across regions: while Asian economies experienced a growth rate of 5.1 percentage points, average GDP growth in the Latin America and the Caribbean region was –2 percentage points.

But these statistics on GDP growth do not take into account differences in pre-crisis growth rates, and thus do not capture the extent of growth deceleration during the crisis. In particular, there is a greater degree of cross-country similarities if we measure economic performance in terms of growth collapses, defined as the percentage point difference in real GDP growth between 2007 and 2009. In contrast to the standard view, growth collapses were in fact larger in emerging economies relative to advanced economies, 7.2 versus 6.1 percentage points, respectively. On the bright side, low-income economies suffered a smaller decline in GDP growth of just 3.2 percentage points (Table 1).⁷

A geographical parsing of the data confirms this pattern: no financially integrated emerging region was immune to the global crisis, and declines in real GDP growth rates are observed across the globe.

⁵ This shift in the net foreign asset position of emerging economies is the reverse of the exorbitant privilege documented for the U.S. (Gourinchas and Rey, 2007). Namely, the observation that the U.S. has increased its share of low yield short-term liabilities on its total gross foreign liabilities and simultaneously increased its share of high-yield assets on its total gross foreign assets. This change in the balance sheet allowed the U.S. to earn a significant excess return on assets over liabilities.

⁶ Throughout this section, each economy's observation within each group is weighted by its level of GDP in 2007 measured in U.S. dollars relative to the group aggregate.

⁷ If simple averages are used instead, advanced economies actually have greater collapses. However, the difference in growth collapses between advanced and emerging economies is not statistically different from zero.

Table 1

Growth, growth volatility, collapse, and recovery.

		Advanced economies	Emerging economies	Low-income economies
Average GDP growth in 2000–2007		2.4	6.2	6.9
GDP growth in 2008		0.0	5.3	6.2
GDP growth in 2009		–3.6	0.9	4.8
GDP growth in 2010		2.5	6.7	5.8
GDP growth in 2011		2.1	5.8	5.9
GDP growth collapse				
GDP growth in 2009 minus GDP growth in 2007		–6.1	–7.2	–3.2
GDP growth in 2009 minus average		–6.0	–5.4	–2.3
GDP growth in 2000–2007				
GDP growth recovery				
GDP growth in 2010 minus GDP growth in 2009		6.1	5.9	1.0
GDP growth in 2011 minus GDP growth in 2009		5.7	4.9	1.1
Change in real GDP growth – average				
All sample – 1980–2007	All observations	0.1	0.3	0.2
	Positive	1.6	3.9	4.8
	Negative	–1.5	–3.6	–4.8
Tranquil years	All observations	0.1	0.1	0.3
	Positive	1.5	3.2	4.3
	Negative	–1.5	–3.1	–3.9
Crisis years	All observations	0.2	–0.8	0.5
	Negative	–1.7	–5.8	–5.1
Post-crisis years	All observations	0.0	2.0	–0.4
	Positive	2.2	6.0	4.7
2009	All observations	–4.4	–5.2	–2.0
	Negative	–4.4	–5.9	–4.1
2010	All observations	5.4	5.2	1.3
	Positive	5.8	5.8	3.1
Mean tests				
2009 (Negative) vs tranquil years (Negative)		–2.9 ***	–2.8 ***	–0.2
2009 (Negative) vs crisis years (Negative)		–2.8 ***	–0.2	0.6
2010 (Positive) vs tranquil years (Positive)		4.4 ***	2.7 ***	–1.2
2010 (Positive) vs post-crisis years (Positive)		3.7 ***	–0.3	–1.7 **
Average pre-crisis IP growth (Jan. 02–Apr. 08)		1.7	7.9	5.7
Extent of collapse (2008's peak to trough)				
Collapse in IP level		–21.0	–13.8	–11.9
Collapse in IP growth		–25.4	–24.0	–18.7
Length of recovery (since trough)				
No. of months to recover half of the collapse in IP level		12.6	5.7	3.7
No. of months to recover half of the collapse in IP growth		6.4	6.7	2.6
No. of months to recover to average pre-crisis IP growth		9.6	8.6	1.1

This table shows statistics on real GDP growth rates, changes in real GDP growth rates, and the extent and length of industrial production (IP) collapse and recovery around the 2008–2009 crisis. Except for the number of months, the figures shown are in percent. For the changes in real GDP growth rates, the figures correspond to the unweighted cross-country mean of the within-country averages. The mean tests show the differences in the mean change in real GDP growth rate between the 2009 collapse and tranquil and crisis years, respectively, pooling all observations within each category. Similar estimates are reported for the 2010 recovery. The tests condition for positive or negative values of the change in growth rates. See the main text for the sources and definitions of the other crises. Collapse in IP level (IP growth) is defined as the percentage change between the within-country's IP level (IP growth rates) peak during 2008 and its trough between January 2009 and June 2010, averaged across income levels. IP growth rates are year-on-year based on monthly data. Average pre-crisis IP growth rates are calculated across the January 2002 to April 2008 period. GDP data come from the IMF's World Economic Outlook (October 2010). When actual GDP data are not available for 2010 or 2011, we use estimates from Consensus Forecasts (January 2010) or World Economic Outlook (October 2010). IP data come from the World Bank's Global Economic Monitor. Real GDP growth rates income-level averages are weighted by 2007 nominal GDP in U.S. dollars from the World Economic Outlook (October 2010).

Economies in Latin America and the Caribbean and in Eastern Europe and Central Asia experienced greater growth collapses than those observed in advanced economies (7.7 and 12.6 percentage points, respectively, in comparison to 6.1 percentage points). Growth collapses were somewhat smaller in Asian economies and Middle East and African ones (4.9 percentage points in both regions). Overall, these are significant declines in GDP growth rates that are obscured by the evidence based on plain GDP growth rates. That is, the deceleration in growth observed in 2009 was highly homogeneous around the world.

Fig. 1 shows that most of the (relatively few) economies that grew faster in 2009 than in 2007 were in fact low-income economies. The figure also shows a statistically significant U-shape pattern of growth collapses against GDP per capita. That is, the largest growth collapses did not occur among the richest economies. We consider several robustness tests to support this claim. First, the U-shape remains even after dropping economies with a GDP growth collapse greater than 19 percentage points (Angola, Armenia, Estonia, Latvia, Lithuania, and Ukraine). Second, the slope coefficient of a linear regression of growth collapse on the logarithm of GDP per capita for those economies with GDP per capita above 8000 PPP-adjusted U.S. dollars is slightly positive but not statistically different from zero; thus, if anything, the richest economies tended to have smaller, not greater growth collapses.⁸ Third, Table 2 shows regressions of growth collapses on income dummies. Again, the dummies for advanced and emerging economies are not statistically different from each other. If anything, emerging economies suffered greater collapses. On the contrary, low-income economies did suffer smaller collapses.⁹

These findings stand in contrast with the performance of emerging and advanced economies around previous crisis episodes. The upper-right panel of Table 2 shows regressions of growth collapses on income and regional dummies during the Russian and Asian crises of 1997–1998, which we use as benchmark. During those crises, emerging and low-income economies across all regions suffered large growth collapses, while advanced economies suffered only modest growth decelerations. In addition, collapses do not seem to be associated to the level or the square of GDP per capita. The results in Table 2 for both the 1997–1998 and 2008–2009 crises are robust to weighting observations by population and by pre-crisis GDP measured in U.S. dollars. Moreover, the results are robust to excluding some or all European economies, as they may disproportionately affect the coefficients for advanced economies.

The timing of the 2008–2009 crisis renders annual data on GDP inadequate for a thorough analysis of the economic cycle that includes, for instance, the duration of downturns: peaks and troughs in economic activity do not necessarily coincide with calendar years. Hence, we turn to data on IP at a monthly frequency. These data allow us to construct different measures of the severity and duration of the recession that cannot be built using data at the annual frequency. Fig. 2 displays the evolution of IP indexes across income groups relative to geometric pre-crisis trends. We normalize these indexes to 100 in April 2008, the pre-crisis peak of IP in advanced economies. The top panel shows the level of IP in advanced economies together with a geometric trend between January 1995 and April 2008. The middle and bottom panels report analogous series for emerging and low-income economies, respectively. For the case of emerging economies, however, there is a clear break in the trend around 2002. Therefore, we also add a geometric trend between January 2002 and April 2008. Clearly, the 2008–2009 crisis was more severe than typical business-cycle fluctuations in both developed and emerging economies. In contrast, IP in low-income economies during the crisis does not appear to be very different from the usual fluctuations.

While a casual inspection of the data might suggest that the level of IP in advanced economies dropped substantially more than in emerging economies, collapses in the growth rate of industrial production are similar in both groups of economies. In particular, the lower panel of Table 1 shows that the collapse in year-on-year growth rates during the crisis was similar across advanced and emerging

⁸ This result also holds if we drop the economies with growth collapses greater than 19 percentage points.

⁹ As a consistency check, we report in Table 1 several measures of GDP growth, collapse, and recovery. For example, we arrive at a similar conclusions if we define growth collapse as real GDP growth in 2009 minus the average real GDP growth rate during 2000–2007.

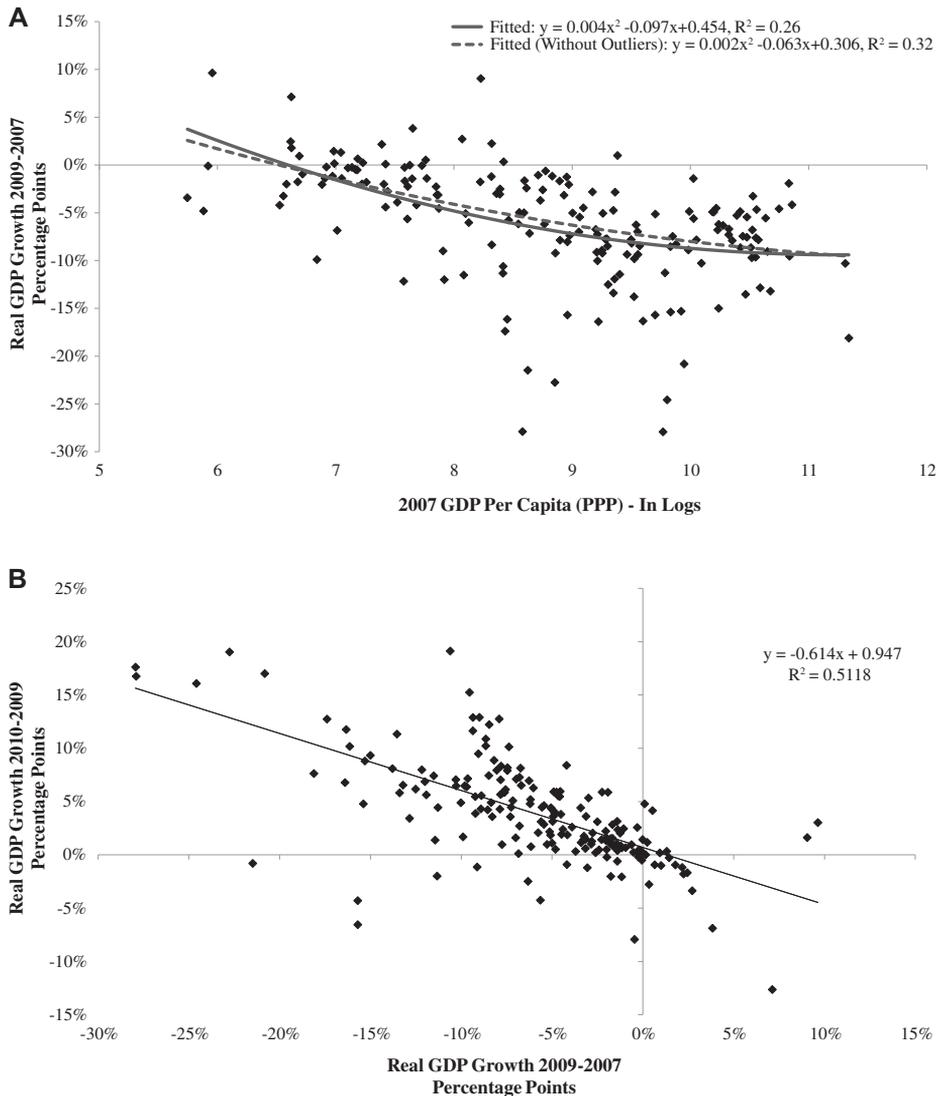


Fig. 1. Real GDP growth collapse and recovery. Panel A: Real GDP growth collapse and income level. Panel B: Real GDP growth collapse and recovery. This figure shows the cross-country relation between real GDP growth collapse around the 2008–2009 crisis and income level (panel A); and the cross-country relation between real GDP growth collapse and recovery around the 2008–2009 crisis (panel B). In panel A, the Y-axis depicts the real GDP growth collapse defined as the real GDP growth rate in 2009 minus the real GDP growth rate in 2007, while the X-axis depicts the natural logarithm of the 2007 GDP per capita (PPP adjusted). In panel B, the Y-axis depicts the real GDP growth recovery, defined as the real GDP growth rate in 2010 minus the real GDP growth rate in 2009; while the X-axis depicts the real GDP growth collapse. The numbers are shown as percentage points of GDP. The fitted lines in panel A estimate quadratic relations between the GDP growth rate and the natural logarithm of GDP per capita. “Fitted (without outliers)” excludes economies with extreme collapses (i.e., negative growth rate higher than 19%). All coefficients are significant at a 5% level.

economies at 25.4 and 24 percent, respectively. On the other hand, low-income economies suffered relatively small declines in IP.

These findings suggest that, within the group of financially and trade integrated economies, the systemic and global dimensions of the crisis dominated country-specific strengths that led to a highly

Table 2

Income and regional differences in real GDP growth collapse and recovery.

Panel A: collapse								
	2008–2009 Crisis				Asian–Russian crises			
	Real GDP growth 2009	Collapse	Collapse	Collapse	Real GDP growth 1999	Collapse	Collapse	Collapse
Advanced economies	–3.830 (0.454)***	–7.157 (0.580)***			3.733 (0.443)***	–1.236 (0.307)***		
Emerging economies	–1.099 (0.568)*	–7.643 (0.662)***			2.841 (0.460)***	–5.553 (0.505)***		
Low-income economies	3.122 (0.564)***	–2.879 (0.686)***			3.235 (0.477)***	–5.386 (0.766)***		
Advanced economies			–7.157 (0.583)***				–1.236 (0.309)***	
Middle East and Africa			–2.666 (0.626)***				–5.557 (0.557)***	
Asia			–4.576 (1.013)***				–6.410 (1.090)***	
Eastern Europe and Central Asia			–12.520 (1.294)***				–5.518 (0.883)***	
Latin America and Caribbean			–6.772 (0.655)***				–4.498 (0.633)***	
Log of GDP per capita				–4.558 (0.987)***				–0.101 (0.929)
Squared log of GDP per capita				0.688 (0.269)**				0.181 (0.228)
Constant				–1.000 (0.693)				–5.677 (0.921)***
Number of observations	170	170	170	170	172	170	170	170
R-squared	0.211	0.573	0.670	0.253	0.389	0.528	0.535	0.021
Adjusted R-squared	0.197	0.565	0.660	0.244	0.378	0.520	0.521	0.009
Wald test: advanced = emerging	14.092***	0.305			1.950	53.383***		
Wald test: advanced = low-income	92.112***	22.681***			0.586	25.276***		
Wald test: emerging = low-income	27.774***	24.947***			0.353	0.033		

Panel B: recovery								
	2008–2009 Crisis				Asian–Russian crises			
	Real GDP Growth 2010	Recovery	Recovery	Recovery	Real GDP Growth 1999	Recovery	Recovery	Recovery
Advanced economies	1.605 (0.465)***	5.435 (0.639)***			4.277 (0.286)***	1.191 (0.292)***		
Emerging economies	3.810 (0.362)***	4.909 (0.520)***			4.550 (0.356)***	4.151 (0.613)***		
Low-income economies	4.653 (0.375)***	1.531 (0.550)***			2.842 (0.638)***	1.916 (0.864)**		
Advanced economies			5.435 (0.643)***				1.191 (0.294)***	
Middle East and Africa			1.524 (0.391)***				2.049 (0.800)**	
Asia			3.330 (0.986)***				4.942 (1.214)***	
Eastern Europe and Central Asia			7.421 (1.147)***				5.911 (1.321)***	
Latin America and Caribbean			4.407 (0.779)***				1.730 (0.675)**	
Log of GDP per capita				2.356 (0.755)***				2.048 (1.150)*
Squared log of GDP per capita				–0.234 (0.202)				–0.435 (0.280)

Table 2 (continued)

Panel B: recovery								
	2008–2009 Crisis				Asian–Russian crises			
	Real GDP Growth 2010	Recovery	Recovery	Recovery	Real GDP Growth 1999	Recovery	Recovery	Recovery
Constant				0.674 (0.595)				1.382 (1.122)
Number of observations	170	170	170	170	173	172	172	172
R-squared	0.617	0.473	0.523	0.177	0.528	0.245	0.282	0.026
Adjusted R-squared	0.610	0.464	0.508	0.167	0.520	0.232	0.260	0.015
Wald test:	13.997***	0.408			0.358	18.994***		
advanced = emerging								
Wald test:	26.003***	21.462***			4.216**	0.633		
advanced = low-income								
Wald test:	2.620	19.934***			5.469**	4.451**		
emerging = low-income								

This table shows ordinary least square regressions of real GDP growth rates, collapse measures, and recovery measures around different crises against income-level and regional dummies and GDP per capita. Collapse during the 2008–2009 crisis is defined as the difference between the real GDP growth rate in 2009 vis-à-vis the real GDP growth rate in 2007. Collapse during the Asian and Russian crises is defined as the difference between the maximum and minimum growth rates between 1996 and 1999, considering the monotonic declines in growth rate. Recovery during the 2008–2009 crisis is defined as the difference between the expected real GDP growth rate in 2010 vis-à-vis the real GDP growth rate in 2009. Recovery during the Asian and Russian crises is defined as the difference between the real GDP growth rate in 2000 vis-à-vis the minimum growth rate used to calculate the collapse. The bottom lines show *F* statistics for Wald tests on whether the coefficient of the different income-level dummies are equal. Robust standard errors are in parentheses. *, **, and *** mean significance at the 10%, 5%, and 1% levels respectively.

synchronized and homogeneous deceleration of growth. In this context, low-income economies that were less integrated to the rest of the world were relatively more isolated from the global shock and thus suffered smaller growth collapses.

2.2. Performance during the recovery

Annual GDP data show a large bounce-back effect in economic activity: economies that suffered greater collapses were typically those that enjoyed larger growth recoveries defined as GDP growth in 2010 minus that in 2009 (Fig. 1).¹⁰ Only a few economies suffered a decline in growth rates between 2007 and 2009 and a consecutive decline between 2009 and 2010.¹¹

Nevertheless, the degree of cross-country heterogeneity observed during the recovery has been greater than that of the downturn. In particular, as the effects of the global systemic shock faded, the relative strengths of individual economies might have started to play a more fundamental role. Heterogeneity in the rebound is observed not just between advanced and emerging economies, but also across emerging regions. Even though advanced economies and economies in the Eastern Europe and Central Asia region suffered large collapses, their recovery was not as strong as that observed in other emerging regions.

This last observation predicts that, by 2010 or 2011, not all economies would recover all the losses derived from the crisis; and that is what we observe. One way of capturing this cost is assessing where economies stand relative to some reference level of GDP. To do this, we consider two reference levels for GDP: (i) the GDP level that was reached in 2008 (i.e., the pre-crisis annual peak), and (ii) the level that would have been reached in 2010–2011 had economies maintained their average growth rates registered during 2000–2007. The latter reference level is an estimate of trend GDP.

¹⁰ We use Consensus Forecasts or World Economic Outlook estimates when actual 2010 GDP data are not available.

¹¹ These economies are Albania, Azerbaijan, Equatorial Guinea, Djibouti, Greece, Guyana, Haiti, Kyrgyz Republic, Pakistan, The Gambia, Uganda, and Vanuatu.

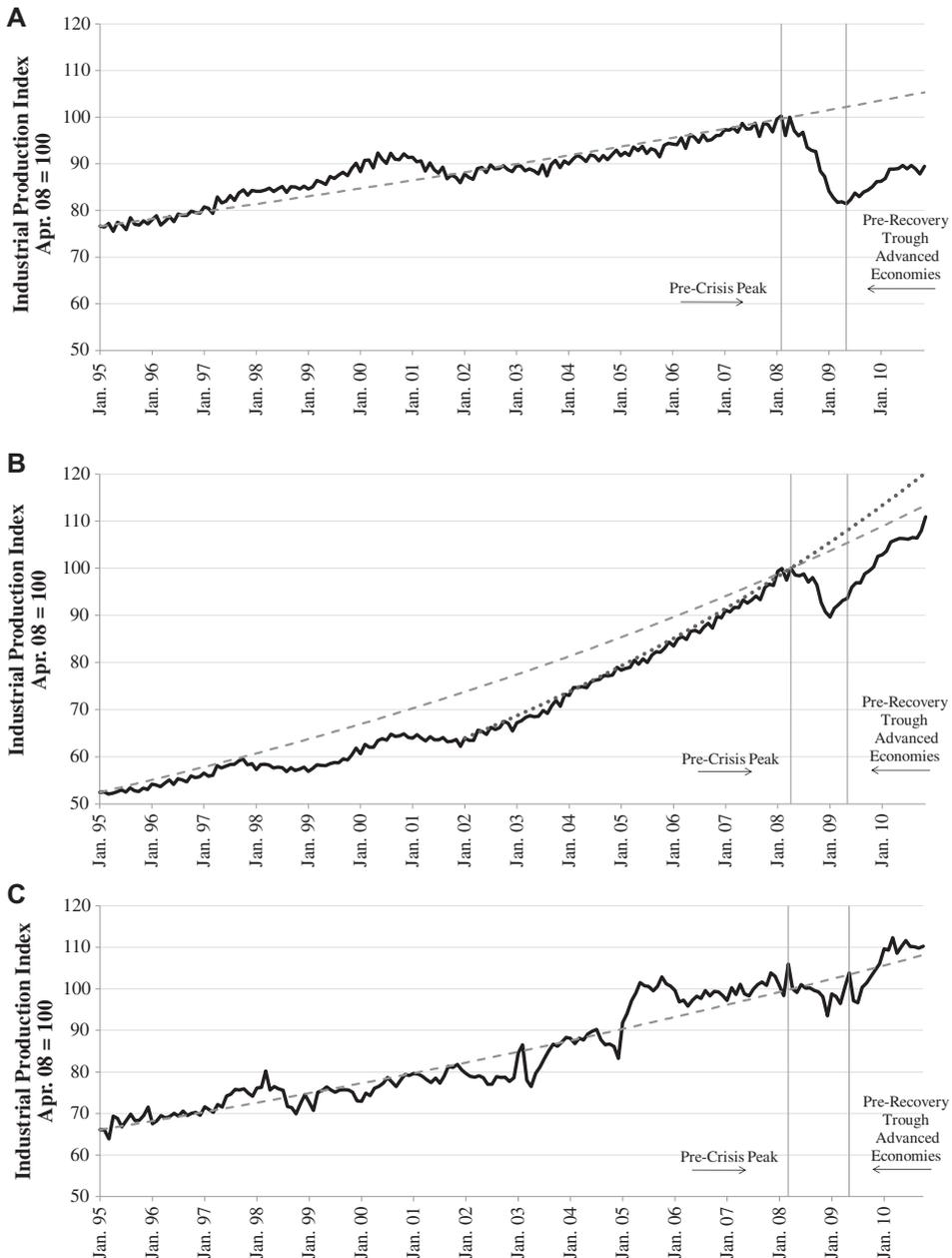


Fig. 2. Industrial production. Panel A: Industrial production level – advanced economies. Panel B: Industrial production level – emerging economies. Panel C: Industrial production level – low-income economies. This figure shows the industrial production (IP) level (indexed to 100 in April 2008) and the IP level pre-crisis' geometric trend during the 2008–2009 crisis by income level. The pre-crisis trend for each income level is constructed by calculating the pre-crisis compounded annual growth rate between January 1995 and April 2008 and extrapolating it until the end of the sample. An additional IP-level pre-crisis geometric trend between January 2002 and April 2008 is shown for emerging economies. The IP data come from the World Bank's Global Economic Monitor. Income-level averages are weighted by 2007 nominal GDP in U.S. dollars from the World Economic Outlook (October 2010).

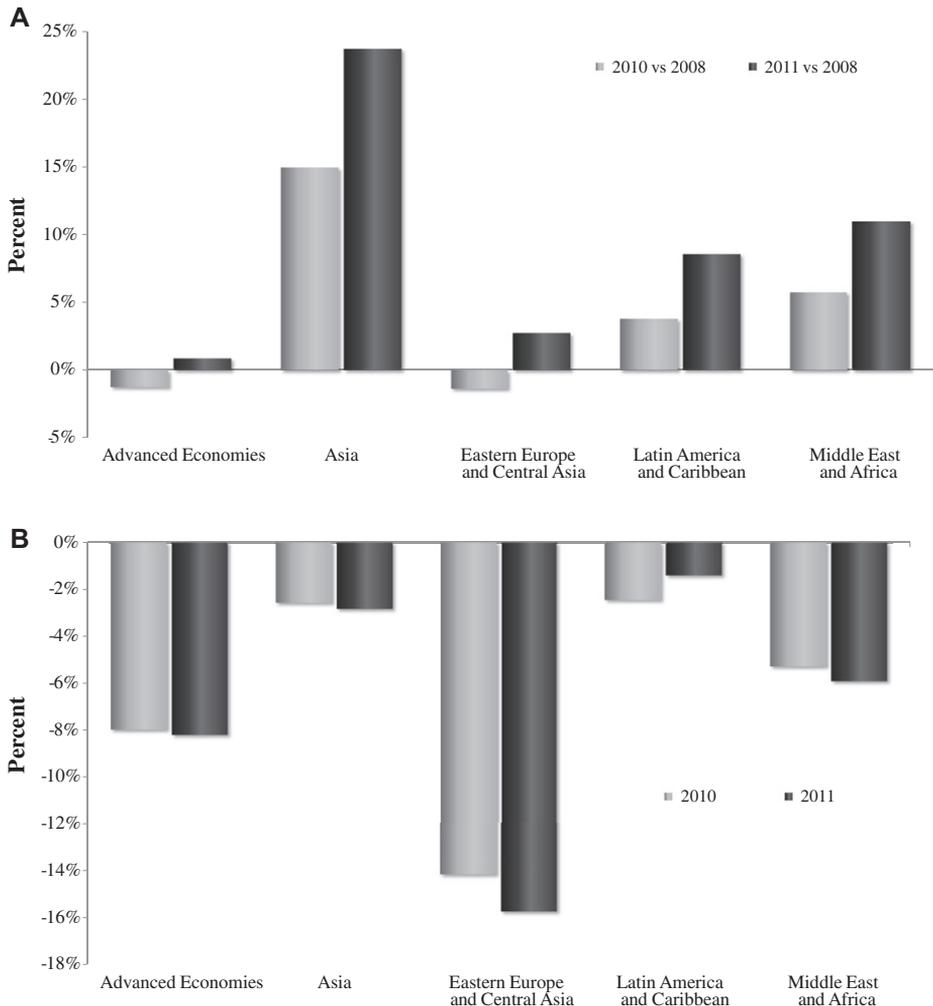


Fig. 3. Real GDP growth rates and output losses relative to pre-crisis trend. Panel A: Post-crisis GDP levels relative to peak. Panel B: Real output losses relative to pre-crisis real GDP growth trends. This figure shows real GDP in 2010 and 2011 in comparison with previous trends. Panel A shows the projected real GDP in 2010 and 2011 as a percentage of the 2008 real GDP. Panel B shows the projected real output losses relative to the real GDP trend for 2010 and 2011 defined as the difference between projected real GDP for 2010 (2011) and the counterfactual real GDP for 2010 (2011), expressed as a percentage of counterfactual real GDP for 2010 (2011). Projected real GDP is calculated based on the 2009 real GDP level and 2010–2011 growth projections (and actual figures for some economies for 2010). Counterfactual real GDP is constructed by extrapolating pre-crisis average growth rates through the 2008–2011 period (i.e., as if there had been no crisis event). Data for the counterfactual real GDP are thus calculated based on the 2007 real GDP level and the 2000–2007 average growth rate extrapolated through 2008–2011.

Consider first the expected level of GDP in 2010–2011 relative to that of 2008 (Fig. 3). In 2010, the average levels of GDP in advanced economies and in Eastern Europe and Central Asia are estimated to remain below their 2008 levels by -1.2 and -1.6 percent, respectively. In contrast, the GDP of the remaining developing regions comfortably exceeded that of 2008 by 2010. All regions are expected to exceed their 2008 GDP levels by 2011, although with substantial heterogeneity: at one extreme, the 2011 level of GDP in Asia is expected to be 24 percentage points above its 2008 value; at the other extreme, GDP in advanced economies is expected to be just 0.87 percentage points above its 2008 value. Similar patterns emerge if the comparison is made against the GDP levels that would have been achieved had economies continued to grow at the average rates achieved during 2000–2007 (Fig. 3,

bottom panel). The difference between expected GDP, calculated based on forecast growth rates, and the counterfactual GDP levels is a rough measure of the output cost of the crisis. By far, the region most affected by the crisis is Eastern Europe and Central Asia, whose expected GDP level is about 14 and 16 percent below the counterfactual trend in 2010 and 2011, respectively.

Annual GDP data suggest that emerging economies recovered similarly to developed economies, at least during 2010. However, analysis of higher-frequency IP data suggests that emerging economies did recover more strongly than advanced economies. While the collapse in IP was similar in advanced and emerging economies, the recovery began earlier in emerging economies. The peak in IP took place around April 2008 for both advanced and emerging economies. But by January 2009, emerging economies had started a sustained recovery; while advanced economies started to rebound only in May 2009 (Fig. 2 and Table 1). Thus, the downward phase of the cycle lasted, on average, nine months for emerging economies and 13 months for advanced economies. As a consequence, emerging economies achieved their pre-crisis levels of IP by November 2009, whereas advanced economies were still well below their pre-crisis levels by December 2010.¹² Moreover, during the rebound, emerging economies witnessed growth rates in IP sometimes even larger than pre-crisis rates, a phenomenon not observed in advanced economies. For example, using the data in Fig. 2, we observe that IP in advanced economies was over sixteen percentage points below its geometric trend by December 2010, but in emerging economies it was about nine percentage points below trend by that date.¹³

2.3. Volatility or resilience?

One important difference between emerging and developed economies is their degree of volatility in economic activity. To the extent that typical business-cycle fluctuations are more volatile in emerging economies, we expect larger declines and recoveries in these economies. To address this issue, we report in Table 1 (middle panel) statistics on yearly changes in GDP growth during crisis and non-crisis years over 1980–2010.¹⁴ We first observe that GDP growth in emerging economies is twice as volatile as that of advanced economies during tranquil periods: the average positive (negative) change in GDP growth is 3.2 (–3.1) percentage points in the former and 1.5 (–1.5) in the latter. This difference becomes more acute during crisis years (excluding the 2008–2009 crisis) as the average decline in GDP growth is –5.9 and –1.7 percentage points in emerging and advanced economies, respectively. In contrast, in 2009, the average change in GDP growth was –5.9 and –4.4 percentage points, respectively. These numbers show that the 2008–2009 crisis was not a typical business-cycle fluctuation: the average cross-country decline in GDP growth during 2009 was almost twice as large as that during tranquil times in emerging economies. More formally, *t*-test statistics of equality of means comfortably reject the null hypothesis that these averages are the same.¹⁵ In addition, the table also discloses one way in which emerging economies have become better, at least in relative terms. During previous crises, the decline in the change in GDP growth was about 247% (5.9/1.7) larger in the typical emerging economy than in the typical advanced economy. In contrast, during 2009, the collapse in GDP growth was only 34% (5.9/4.4) larger in the typical emerging economy relative to the typical advanced economy.

3. Transmission channels of the global shock

For the most part, the classic literature on the transmission of shocks across economies focuses on shocks that originate in emerging economies that spill over to other emerging economies. But this time

¹² Alternative measures capturing the length of the recession, displayed in the bottom panel of Table 1, confirm that emerging economies started to recover earlier than advanced economies.

¹³ In making this comparison, we use the emerging economies' geometric trend over the period January 2002–April 2008.

¹⁴ The crisis years are defined using a composite crisis indicator that takes into account banking, currency, and domestic and external debt crises on an annual basis. The beginning of a crisis event is considered as the first year with any of these crisis events, provided that no other crisis has been observed in the preceding two years. For more details, see Broner et al. (2011).

¹⁵ The statistics to test the equality of means are calculated by taking the difference between averages for each category. This might differ from the differences of the means reported as those were calculated by first averaging within economies and then across regions.

the shock starts in the center of the world financial system, is of a larger scale, and is transmitted worldwide mostly through trade and financial factors.

3.1. *The trade channel*

Early signs of a downturn in advanced economies started to appear early in 2008 when IP showed weakening performance in the second quarter. The recession in these economies continued to deepen during the second half of 2008.¹⁶ Consumers in advanced economies suffered a large negative wealth effect as stock markets plummeted, and they abruptly demanded fewer goods from the rest of the world. As global demand collapsed, the price of these goods declined as well. In other words, the large decline in export volumes was accompanied by a drop in commodity prices that hit all commodity exporters regardless of the final destination of their exports. These lower export prices might have amplified the direct impact of lower global demand, which spread the global crisis even further. Moreover, the negative income shock suffered by commodity exporters might have lowered their demand for imports from other economies that then reinforced the decline in global demand. Naturally, economies more open to trade and more dependent on exports (such as those in East Asia) were hit more severely.

The worldwide collapse in trade flows occurred almost simultaneously with the generalized fall in IP levels. Global export volumes fell by around 25 percent between April 2008 and January 2009, and started to rebound thereafter, mirroring the observed trends in IP. For instance, emerging economies suffered a collapse in trade volumes similar to that in advanced economies: between April 2008 and January 2009, export volumes declined by around 22 percent in both groups of economies. In advanced economies, however, the decline in export volumes lasted longer than in other regions, consistent with the slower recovery observed in their IP. Perhaps surprisingly, low-income economies suffered a collapse in trade similar to that of advanced and emerging economies but lower GDP collapses. This could be at least in part explained by a lower degree of trade integration of these economies; that is, the drop in export volumes might have had only a small impact on their level of economic activity.

3.2. *The financial channel*

The financial channel of shock transmission operates through the financial account that connects economies to the international financial system. When the large global shock, namely the post-Lehman Brothers panic, affected the world economy the negative wealth effect suffered in high-income economies led to a decrease in foreign investments and, therefore, to less available capital around the world. This direct financial effect can be amplified by mechanisms that affect how financial intermediaries typically operate. For instance, international investors (banks, mutual funds, hedge funds, and so forth) might have to reduce their exposures to emerging economies in response to shocks affecting the size, liquidity, and quality of their assets. Leveraged investors, such as banks and hedge funds, might face regulatory requirements, internal provisioning practices, or margin calls that prompt them to rebalance their portfolios by selling their foreign assets. In addition, international banks and other agents might generate capital outflows during crises; for example, if a parent bank in another economy finds itself in need of a boost to its capital. Therefore, losses in a crisis-hit economy might lead international investors to sell off assets or curtail lending in other economies as well.

Several developments in the global financial system during the last two decades might have amplified the transmission of the shock. Financial globalization and securitization (the process of transforming illiquid assets into traded securities) led to a complex net of interconnections among financial institutions across economies. The complex and multiple-layer structure of the securitization process generated opaque and hard-to-value assets on their balance sheets. Simultaneously, financial institutions increased their leverage and financed their portfolios with less capital and more short-term debt, which might have reflected a moral hazard problem due to implicit government

¹⁶ Taylor (2009, 2010) argues that the U.S. government's announcement that "there is systemic risk" and that "the Great Depression is coming" led to worldwide panic and extreme uncertainty.

guarantees. With Lehman Brothers' bankruptcy in September 2008, investors reassessed their expectations of whether large and complex financial institutions would be allowed to fail, which led to more uncertainty about the consequences of possible failures of highly interconnected banks. As a consequence, spreads in the interbank market skyrocketed and banks with large exposures to nonperforming loans suffered large declines in their short-term funding. New information from Lehman's collapse, along with the uncertainty involved in the true value of the assets of financial institutions, prompted a re-pricing of risk that induced a cycle of deleveraging as financial institutions found difficulties in rolling over their short-term liabilities. As large financial institutions deleveraged, credit to the nonfinancial sector declined as well. Simultaneously, as a response to higher risks, investors pulled out of risky assets, both in advanced and emerging economies, and purchased assets perceived to be safer (mostly, U.S. T-bills).¹⁷

The increase in uncertainty, re-pricing of risk, and flight-to-quality effects were manifested in large declines in asset prices and capital flows around the world. There were large declines in capital inflows by foreign investors across advanced and emerging economies. Advanced economies experienced a large drop in capital inflows between the first and last quarter of 2008 of 13 percentage points of GDP. The decline in emerging economies, of about 11 percentage points of GDP, was concentrated between the third and fourth quarters of the same year. In contrast, low-income economies suffered a sudden but short-lived drop in capital inflows in the first quarter of 2009; flows returned to their previous levels over the next quarter. Moreover, while capital was flowing out of financially open economies during the peak of the turmoil, stock markets collapsed in a highly synchronized way across regions; and credit stagnated. This suggests a reinforcing pattern in which a decline in capital flows might have triggered collapses in asset prices and a generalized deterioration in conditions in domestic financial systems that in turn could have amplified the international flow of capital due to margin calls and capital requirements, among other triggers.

3.3. Correlates of growth collapses and growth recoveries

To shed light on the impact of different variables related to the trade and financial mechanisms discussed above on growth collapses and recoveries, we present cross-country regressions for the 2008–2009 global financial crisis and, for comparison purposes, regressions for the Asian and Russian crises of the late 1990s. To mitigate some of the endogeneity concerns, we measure the explanatory variables at their pre-crisis values, namely 2007 values in the case of the 2008–2009 crisis and 1996 values for the Asian and Russian crises.¹⁸

Table 3 reports regressions of growth collapses during the 2008–2009 crisis and the Asian and Russian crises on a number of variables capturing transmission channels. These regressions suggest that economies more open to trade, with larger current account deficits, with higher growth rates of domestic credit relative to GDP over 2003–2007, and more financially open suffered greater growth collapses during the 2008–2009 crisis. Although reserves in 2007 seem to be positively associated with growth collapses (top panel), the effect disappears after controlling for trade openness (bottom panel). Besides being statistically significant, these estimated coefficients are also economically significant. For example, the estimated coefficient of 0.06 for trade openness during the global crisis means that, on average, an increase in trade openness of 10 percentage points of GDP is associated with an additional drop of 0.6 percentage points in GDP growth during this turbulent episode. Results for the Asian and

¹⁷ Many observers have argued that the financial channel has been the main channel of transmission of shocks across economies during the 1990s (Baig and Goldfajn, 1999; Kaminsky and Reinhart, 2000; Van Rijckeghem and Weder, 2001; Caramazza et al., 2004). See also Kaminsky and Reinhart (2000) and Martinez Peria et al. (2005) on the role of banks; Borensztein and Gelos (2003), Kaminsky et al. (2004b), Broner et al. (2006), and Raddatz and Schmukler (in press) on the role of mutual funds, among many others. Similar channels also operated during the global crisis.

¹⁸ Our goal in this section is to consider a reduced set of, arguably, uncontroversial explanatory variables. There are several papers focused on uncovering the different possible variables affecting the incidence of the 2008–2009 crisis (Blanchard et al., 2010; Claessens et al., 2010; Frankel and Saravelos, 2010; Lane and Milesi-Ferretti, 2010; Rose and Spiegel, 2010, 2011, in press; Rose, 2011). Moreover, Aizenman and Spiegel (2010) argue that being a commodity exporter might also have an impact on the incidence of crises.

Table 3
Correlates of real GDP growth collapse.

	2008–2009 Crisis					Asian–Russian crises				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
<i>Panel A: without income-level dummies</i>										
De facto trade openness (exports + imports, % of GDP)	–0.063 (0.005)***					–0.050 (0.004)***				
Reserves (% of GDP)		–0.194 (0.028)***					–0.194 (0.054)***			
Current account surplus (% of GDP)			0.162 (0.052)***					0.094 (0.123)		
Credit growth (% of GDP)				–0.110 (0.013)***					0.007 (0.012)	
Log of de facto financial openness (% of GDP)					–1.189 (0.085)***					–2.956 (0.701)***
Number of observations	159	164	170	162	164	166	153	144	145	167
R-squared	0.541	0.299	0.073	0.395	0.534	0.407	0.243	0.023	0.002	0.108
Adjusted R-squared	0.539	0.295	0.068	0.391	0.531	0.403	0.238	0.016	–0.004	0.102
<i>Panel B: with income-level dummies</i>										
Advanced economies	–4.440 (1.037)***	–4.634 (1.048)***	–3.957 (0.928)	–5.853 (4.897)	–3.563 (4.295)	–1.248 (0.824)	–1.574 (0.857)*	–1.415 (0.799)*	–0.686 (0.848)	–1.427 (0.975)
Emerging economies	–5.151 (1.335)***	–4.786 (1.282)***	–3.974 (1.010)***	–5.700 (3.960)	–4.087 (3.417)	–5.689 (1.161)***	–6.264 (1.129)***	–5.543 (1.059)***	–6.038 (1.191)***	–6.508 (1.365)***
Low-income economies	–0.718 (0.904)	0.030 (0.892)	0.698 (0.877)	–1.433 (3.673)	0.904 (3.266)	–5.744 (1.293)***	–6.612 (1.434)***	–5.258 (1.262)***	–5.781 (1.258)***	–6.356 (1.447)***
De facto trade openness (exports + imports, % of GDP)	–0.034 (0.011)***	–0.029 (0.011)***	–0.024 (0.009)***	–0.035 (0.014)**	–0.024 (0.014)*	–0.003 (0.012)	0.007 (0.013)	0.003 (0.011)	0.009 (0.014)	0.018 (0.017)
Reserves (% of GDP)	0.031 (0.027)				0.018 (0.035)	0.027 (0.025)				0.011 (0.031)
Current account surplus (% of GDP)		0.062 (0.039)			0.011 (0.039)		–0.060 (0.062)			0.025 (0.076)
Credit growth (% of GDP)			–0.061 (0.013)***		–0.062 (0.016)***			0.001 (0.008)		–0.003 (0.008)
Log of de facto financial openness (% of GDP)				0.271 (0.910)	–0.079 (0.788)				–1.118 (0.899)	–1.047 (1.097)
Number of observations	153	159	152	155	145	151	142	143	163	123
R-squared	0.616	0.617	0.706	0.608	0.704	0.527	0.524	0.509	0.533	0.496
Adjusted R-squared	0.603	0.604	0.696	0.595	0.687	0.511	0.507	0.491	0.519	0.461

(continued on next page)

Table 3 (continued)

	2008–2009 Crisis					Asian–Russian crises				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
Wald test: advanced = emerging	0.479	0.031	0.000	0.013	0.166	40.441***	43.185***	37.664***	22.324***	17.528***
Wald test: advanced = low-income	15.249***	21.651***	32.714***	8.539***	9.351***	22.220***	21.976***	19.213***	16.481***	14.386***
Wald test: emerging = low-income	16.618***	18.151***	25.965***	16.533***	22.783***	0.003	0.102	0.092	0.088	0.026

This table shows ordinary least square regressions of a real GDP growth collapse measure around the 2008–2009 crisis and the Asian and Russian crises against trade and financial variables. Panel B includes income-level dummies. Collapse during the 2008–2009 crisis is defined as the difference between the real GDP growth rate in 2009 vis-à-vis the real GDP growth rate in 2007. Collapse during the Asian and Russian crises is defined as the difference between the maximum and minimum growth rates between 1996 and 1999, considering the monotonic declines in growth rate. Explanatory variables are measured at their 1996/2007 values to mitigate endogeneity concerns. “Credit Growth” is calculated across the five years previous to the start of each crisis. “Log of de Facto Financial Openness” is defined as the sum of the stock of foreign assets and liabilities scaled by GDP. The data come from Lane and Milesi-Ferretti (2007). The bottom lines show F statistics for Wald tests on whether the coefficient of the different income-level dummies are equal. Robust standard errors are in parentheses. *, **, and *** mean significance at the 10%, 5%, and 1% levels, respectively.

Russian crises are similar except that the current account and credit growth are statistically insignificant.

Note that the coefficients on income dummies (bottom panel) suggest that, even after controlling for some of the variables believed to be related to the growth collapse, there is no difference in the GDP growth collapse experienced by advanced and emerging economies during the 2008–2009 crisis. Low-income economies, however, indeed fell less. In contrast, during the Asian and Russian crises, growth declines in advanced economies were modest if compared to those in emerging and low-income economies, which suffered collapses of similar magnitude.

Table 4 reports cross-country regressions analyzing the recovery from both crises, with and without the extent of the growth collapse as an explanatory variable. Consistent with the graphical analysis in Fig. 1, we find that economies that suffered larger collapses in real GDP growth experienced stronger growth recoveries both during the 2008–2009 crisis and the Asian and Russian crises. In addition, there is some evidence that economies more open to trade, with higher ratios of international reserves to GDP, and more financially open experienced stronger recoveries. Most of the estimated coefficients on explanatory variables are not statistically different from zero after controlling for the extent of the collapse during the 2008–2009 crisis, except perhaps for trade openness. When this bounce-back effect is not controlled for (top panel), the variables statistically significant in the collapse regressions (Table 3) also tend to be statistically significant in explaining the growth recovery. Similar results are observed for the growth recovery around the Asian and Russian crises. Once we control for the growth collapse, most of the variables are no longer statistically significant in explaining the growth recovery.

4. Resilience and policy responses to the crisis

Once an economy is hit by an external shock, the way it performs and how resilient it is depends to a large extent on its economic fundamentals. In previous crisis episodes, many emerging economies were usually caught with substantial macroeconomic and financial vulnerabilities that sapped their ability to undertake countercyclical policies. They were instead compelled to respond procyclically: to raise interest rates, cut fiscal spending, and/or hike taxes to cope with capital outflows, currency pressures, and low international reserve levels. Furthermore, in many cases, even these measures were unable to prevent financial meltdowns. As argued by Reinhart and Reinhart (2008), the lack of access to world capital markets during turbulent times might have hampered the ability of governments to conduct countercyclical fiscal policies.¹⁹

In stark contrast with this past, and at least in part exactly because of it, many emerging economies were better prepared to withstand external shocks and were consequently in relatively stronger positions when the global financial crisis erupted. The crisis found many emerging economies with the required credibility and space to conduct countercyclical monetary and fiscal policies and a more consolidated financial stance. Several factors proved to be useful during late 2008 and early 2009, creating buffers between the external conditions and the local economy. Broadly speaking, these factors comprise developments in (i) monetary and exchange-rate policies, (ii) fiscal policy, and (iii) external and domestic financial positions.²⁰

4.1. Monetary and fiscal policy

Perhaps one of the most surprising features of the emerging economies' responses to the global crisis was the drastic reduction in interest rates. During previous crises, emerging economies were typically forced to increase interest rates to contain capital outflows and the drainage in international reserves as their currencies were attacked. During the global crisis, the acquired credibility and institutional capacity of their central banks seemed essential to conduct active countercyclical

¹⁹ Kaminsky et al. (2004a) provide additional evidence documenting that emerging economies have typically followed procyclical policies in bad times.

²⁰ For more details on descriptive statistics and additional anecdotal evidence suggesting a structural break in emerging market policies, see the working paper version of this article (Didier et al., 2011).

Table 4
Correlates of real GDP growth recovery.

	2008–2009 Crisis					Asian–Russian crises				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
<i>Panel A: not controlling for real GDP growth collapse</i>										
De facto trade openness (exports + imports, % of GDP)	0.040 (0.004)***					0.031 (0.005)***				
Reserves (% of GDP)		0.129 (0.019)***					0.112 (0.042)***			
Current account surplus (% of GDP)			−0.100 (0.032)***					−0.107 (0.068)		
Credit growth (% of GDP)				0.060 (0.010)***					0.003 (0.009)	
Log of de facto financial openness (% of GDP)					0.783 (0.066)***					1.930 (0.622)***
Number of observations	159	164	170	162	164	167	153	144	145	167
R-squared	0.421	0.257	0.053	0.233	0.446	0.189	0.107	0.040	0.001	0.054
Adjusted R-squared	0.418	0.252	0.047	0.228	0.442	0.184	0.101	0.034	−0.006	0.048
<i>Panel B: controlling for real GDP growth collapse</i>										
Real GDP growth collapse	0.512 (0.069)***	0.531 (0.072)***	0.570 (0.073)***	0.502 (0.072)***	0.558 (0.076)***	0.682 (0.102)***	0.708 (0.088)***	0.699 (0.107)***	0.644 (0.106)***	0.717 (0.101)***
De facto trade openness (exports + imports, % of GDP)	0.007 (0.005)	0.007 (0.004)*	0.007 (0.004)*	0.000 (0.007)	−0.002 (0.008)	0.001 (0.006)	0.010 (0.006)*	−0.005 (0.006)	0.000 (0.009)	−0.007 (0.009)
Reserves (% of GDP)	0.009 (0.014)				0.009 (0.017)	−0.034 (0.017)**				−0.032 (0.018)*
Current account surplus (% of GDP)		0.005 (0.027)			−0.004 (0.035)		−0.066 (0.031)**			−0.048 (0.040)
Credit growth (% of GDP)			−0.013 (0.008)		−0.012 (0.010)			0.008 (0.007)		0.006 (0.007)
Log of de facto financial openness (% of GDP)				0.184 (0.141)	0.170 (0.155)				−0.090 (0.596)	0.144 (0.572)
Number of observations	153	159	152	155	145	151	142	143	163	123
R-squared	0.676	0.670	0.690	0.676	0.690	0.575	0.607	0.583	0.492	0.607
Adjusted R-squared	0.669	0.664	0.684	0.670	0.676	0.567	0.598	0.574	0.482	0.587

This table shows ordinary least square regressions of a real GDP growth recovery measure around the 2008–2009 crisis and the Asian and Russian crises against trade and financial variables. Panel B includes the real GDP growth collapse measure as an additional control. Recovery during the 2008–2009 crisis is defined as the difference between the expected real GDP growth rate in 2010 vis-à-vis the real GDP growth rate in 2009. Recovery during the Asian and Russian crises is defined as the difference between the real GDP growth rate in 2000 vis-à-vis the minimum growth rate used to calculate the collapse. See Table 3 for real GDP growth collapse definitions. Explanatory variables are measured at their 1996/2007 values to mitigate endogeneity concerns. "Credit Growth" is calculated across the five years previous to the start of each crisis. "Log of de Facto Financial Openness" is defined as the sum of the stock of foreign assets and liabilities scaled by GDP. The data come from Lane and Milesi-Ferretti (2007). Robust standard errors are in parentheses. *, **, and *** mean significance at the 10%, 5%, and 1% levels, respectively.

monetary policies when the world economy came to a halt. For example, inflation-targeting economies in Asia and Latin America implemented drastic reductions in their monetary policy rates. Instead, during previous crises these economies had to increase their interest rates. In contrast to Asian and Latin American economies, money market rates increased considerably during the 2008–2009 crisis in economies in Eastern Europe and Central Asia.

The exchange-rate regime was a key factor behind economies' ability to lower interest rates. With the exception of Eastern Europe, most financially globalized emerging economies have moved towards more flexible exchange-rate regimes, especially after the emerging market crises of the 1990s. This change in exchange-rate policy was feasible for at least two reasons: first, central banks improved their independence, credibility, and institutional capacity; and second, these economies were able to reduce currency mismatches in the government and private sectors' balance sheets through the deepening of local currency debt markets. These developments implied that exchange-rate fluctuations had less adverse balance-sheet effects. As a result of these more flexible monetary regimes, exchange rates were allowed to depreciate significantly in 2008 thereby cushioning the global shock and, at the same time, helping mitigate the deterioration of the external balance. In previous crisis episodes, many emerging economies had to devalue their currencies not as a choice but as the result of a run on their currencies.

Regarding fiscal policy, many emerging economies improved their fiscal stances during the 2000s and acquired enough fiscal space to design and implement packages to counteract the sharp contraction in the world economy. In fact, during the 2008–2009 crisis, many emerging and low-income economies had more fiscal space than developed economies, and a number announced strong countercyclical fiscal policies even larger than those in several advanced economies.²¹ The strong expansion in fiscal balances in emerging economies contrasts with the typical fiscal consolidations observed during previous crises episodes. In the past, emerging economies usually followed procyclical fiscal policies (Kaminsky et al., 2004a) and particularly so during periods of turmoil.

4.2. Financial factors

Two key developments in the management of their financial accounts have helped emerging economies reduce their vulnerabilities to external shocks. First, many economies improved their current account positions, thereby becoming less dependent on foreign financing. Second, and perhaps more importantly, many emerging economies have steadily changed the structure of their external assets and liabilities, which made balance-sheet effects work in their favor during the global crisis. There was a switch of foreign liabilities from debt to equity while debt assets in foreign currency were accumulated to levels that exceeded foreign-debt liabilities. As currencies depreciated, the local currency value of their external assets increased, while that of their debt liabilities shrank. In addition, with the collapse in economic activity and the decline in equity prices, the local currency value of emerging economies' equity liabilities also contracted. Of course, emerging economies were able and willing to let their currencies depreciate precisely because of this change in the composition of their foreign assets and because liabilities did not create concerns for negative balance-sheet effects. In contrast, developed economies saw increased debt liabilities vis-à-vis emerging economies in part as a reflection of large debt flows used to finance the U.S. current account deficit. Simultaneously, advanced economies became net claimants on emerging economies on the equity side.

The other side of the coin of this safer form of international financial integration among emerging economies was the accumulation of foreign reserves, which picked up dramatically in the emerging world after the Asian and Russian crises of the late 1990s. Reserve accumulation has served two purposes in emerging economies: first, it slowed down the appreciation of the domestic currency during the pre-crisis expansionary period; and second, it served as a self-insurance mechanism during the crisis that deterred currency and banking panics. In fact, when the global crisis erupted, many emerging economies held international reserves in excess of their stock of short-term foreign

²¹ Using the fiscal space measure of Aizenman and Jinjarak (2010), Didier et al. (2011) show that in 2007 the groups of emerging and low-income economies had larger fiscal space than the group of advanced economies. Eastern European economies, however, had very low fiscal space according to the proposed measure.

liabilities. In practice, this eliminated concerns about debt-rollover difficulties, which gave investors less incentives to attack emerging market currencies. At the same time, international reserves also gave central banks significant room to contain the depreciation of their currencies during the period of turmoil.

Another important factor behind the flexibility in exchange rates among many emerging economies in the aftermath of Lehman Brothers' demise was the shift in emerging economies' borrowing from foreign currency towards domestic currency. This change in the currency denomination of debt contracts has minimized the negative balance-sheet effects commonly observed in previous crisis episodes when devaluations led to debt-overhang problems. Moreover, some emerging economies were able to increase the average maturity of their domestic and international private debt, also reducing concerns about debt-rollover difficulties. For example, relative to the 1990s, economies in the Latin America and Caribbean region have been able to increase the average maturity of international debt from 5.4 years to 7.7 years. Note that this increase in the maturity of debt across emerging regions, while widespread in local markets, was not as homogeneous in international markets. For instance, while maturity of international debt has increased on average across economies in Latin America and the Caribbean and in Eastern Europe and Central Asia, declines have been observed among economies in Asia and in the Middle East and Africa.

The soundness of domestic financial sectors also improved significantly during the pre-crisis years in several emerging economies due to better regulation and supervision, more prudent practices by financial intermediaries, and abundant local liquidity. When the international wholesale interbank market dried up in the last quarter of 2008, banks that relied more on this short-term wholesale market were hit harder and suffered rollover problems (Raddatz, 2010). Thus, even as the external environment deteriorated sharply, local financial systems remained on sound footing and depositors did not flee the domestic banking system (unlike during previous crises). Perhaps for the first time in recent decades, the domestic financial systems of many emerging economies at least did not amplify the shock emanating from the international financial system.

4.3. A systematic analysis of the structural breaks in policies

In this subsection, we study the structural break in policies across emerging economies by comparing more systematically the responses of key variables during the 2008–2009 crisis vis-à-vis the Asian and Russian crises. To do so, we perform a graphical and statistical comparison of nonparametric densities. We also estimate quantile regressions to document differences across the percentiles of the distribution of policies between the two crisis episodes. We perform the analysis for the sample of all economies and separately for the sample of emerging economies.

Fig. 4 displays nonparametric density estimates of nine monetary, fiscal, and financial indicators for the sample of all economies. Each figure has two density estimates that correspond to the 2008–2009 crisis (black line) and the Asian and Russian crises (grey line), and each has the p -value of the nonparametric Kolmogorov–Smirnov test of equality of the two density functions. On the monetary side, more economies were able to perform countercyclical monetary policy through reductions in their money market rates during the 2008–2009 crisis than in the past. In addition, relative to the Asian and Russian crises, economies suffered lower depreciations but more volatile exchange-rate movements during the 2008–2009 crisis. Moreover, economies lost substantially less reserves during the 2008–2009 crisis than during the Asian and Russian crises. On the fiscal side, while the ratio of revenues to GDP—a measure of average tax rates—was almost identical in the three episodes, there is an increase in the mass of economies with higher deficits and higher changes in government expenditures as a fraction of GDP. Moreover, the figure shows that, during the Asian and Russian crises, many economies had to contract their government expenditures relative to GDP, while during the 2008–2009 crisis relatively few economies had to contract fiscal expenditures.

We also report densities for two measures of wealth effects from debt and equity holdings of each economy. These measures try to capture the change in the local currency value of debt and equity holdings due to changes in nominal exchange rates and in local and international (debt and equity) prices. For these calculations, we use U.S. prices as a proxy for international prices. In particular, we define the wealth effect from debt holdings as:

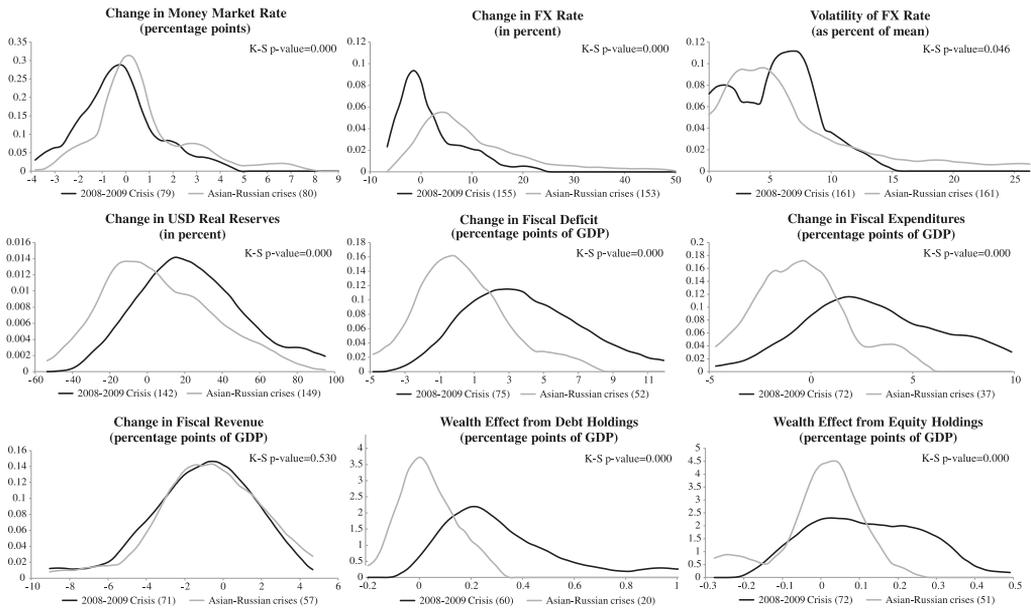


Fig. 4. Density plots. This figure shows the density plots of different policy variables during the Asian and Russian crises and the 2008–2009 crisis. All available economies are included in the density estimations. In the case of the 2008–2009 crisis, policy variables are calculated for the 2007–2009 period. In the case of the Asian and Russian crises, policy variables are calculated during the period used for the collapse variable, defined as the difference between the maximum and minimum growth rates between 1996 and 1999, considering the monotonic declines in growth rate. The wealth effect variables capture the change in the local currency value of debt and equity holdings due to changes in nominal exchange rates and local and international (debt and equity) prices. In particular, the 1996–2007 stock of debt (equity) assets is multiplied by the combined change in the local nominal exchange rate and the change in an international debt (stock) index denominated in U.S. dollars. Similarly, the 1996–2007 stock of debt (equity) liabilities is multiplied by the combined change in the local nominal exchange rate and the change in a local debt (stock) index denominated in U.S. dollars. Both terms are then combined to obtain the net wealth effect. Debt and equity holdings are scaled by GDP. Changes in exchange rates (FX) and debt and stock indexes are calculated across the duration of each crisis as described above. For these calculations, we use the U.S. for the international prices. See the main text for more details. For each variable and crisis, the top and bottom 5 percent of observations are excluded as outliers. “K–S p-value” shows the p-value from a Kolmogorov–Smirnov test of equality of distributions between the two crises for each policy variable. Densities are estimated using the Epanechnikov kernel function. The number of observations included in each density estimation is shown in parentheses.

$$WD_t^i = DA_t^i \left[(1 + \Delta BP_t^{US}) (1 + \Delta FX_t^i) - 1 \right] - DL_t^i \left[(1 + \Delta BP_t^i) (1 + \Delta FX_t^i) - 1 \right],$$

where i denotes an economy; $t = 1996, 2007$ is a time index; DA_t^i denotes debt assets, including foreign reserves, and DL_t^i is debt liabilities, both expressed as a percentage of GDP; ΔBP_t^{US} and ΔBP_t^i denote percentage changes across the crisis period in a debt-price index from the U.S. and economy i , respectively; and ΔFX_t^i is the percentage change across the crisis period in the nominal exchange rate in economy i . The wealth effect from equity holdings is defined as

$$WE_t^i = EA_t^i \left[(1 + \Delta EP_t^{US}) (1 + \Delta FX_t^i) - 1 \right] - EL_t^i \left[(1 + \Delta EP_t^i) (1 + \Delta FX_t^i) - 1 \right],$$

where EA_t^i and EL_t^i denote equity assets and liabilities, respectively, as a percentage of GDP, ΔEP_t^{US} is the percentage change across the crisis period from a U.S. stock-price index, and ΔEP_t^i is the percentage change across the crisis period from a stock-price index in economy i , measured in U.S. dollars. Fig. 4 shows that, during the 2008–2009 crisis, more economies enjoyed positive debt and equity wealth effects relative to the Asian and Russian crises. Moreover, while in the latter crises several economies suffered very large negative wealth effects on debt holdings, inducing negative balance-sheet effects, almost no economy suffered a negative wealth effect on debt holdings during the 2008–2009 crisis relative to the U.S.

Table 5
Quantile regressions.

	Change in money market rate (percentage points)	Change in FX rate (percent)	Volatility of FX rate (percent of mean)	Change in USD real reserves (percent)	Change in fiscal deficit (percentage points of GDP)	Change in fiscal expenditures (percentage points of GDP)	Change in fiscal revenue (percentage points of GDP)	Wealth effect from debt holdings (percentage points of GDP)	Wealth effect from equity holdings (percentage points of GDP)
<i>Panel A: all economies</i>									
2008–2009 crisis dummy:									
Average effect	–1.379 (0.389)***	–9.920 (1.194)***	–1.510 (0.584)**	19.860 (3.404)***	3.878 (0.552)***	3.851 (0.626)***	–0.631 (0.510)	0.315 (0.058)***	0.135 (0.025)***
20th Quantile	–1.108 (0.376)***	–4.327 (0.966)***	–0.972 (0.953)	19.570 (4.059)***	3.240 (0.640)***	2.801 (0.789)***	–0.930 (0.687)	0.201 (0.032)***	0.038 (0.050)
40th Quantile	–0.702 (0.284)**	–6.346 (0.962)***	–0.051 (0.490)	21.930 (2.900)***	3.372 (0.631)***	3.502 (0.553)***	–0.037 (0.565)	0.277 (0.041)***	0.072 (0.030)**
60th Quantile	–0.690 (0.325)**	–9.500 (1.421)***	1.279 (0.641)**	18.790 (5.225)***	3.692 (0.666)***	3.550 (0.784)***	–0.410 (0.645)	0.301 (0.054)***	0.131 (0.038)***
80th Quantile	–1.773 (0.780)**	–11.770 (2.161)***	–2.831 (1.347)**	16.990 (5.372)***	4.701 (0.963)***	5.559 (1.017)***	–0.657 (0.798)	0.394 (0.094)***	0.193 (0.025)***
Constant:									
Average effect	1.051 (0.274)***	11.600 (0.847)***	6.545 (0.413)***	5.491 (2.378)**	0.163 (0.424)	–0.601 (0.509)	–0.520 (0.380)	0.024 (0.050)	–0.008 (0.019)
20th Quantile	–0.463 (0.270)*	1.424 (0.967)	1.968 (0.750)***	–19.270 (2.811)***	–1.761 (0.440)***	–2.565 (0.550)***	–2.456 (0.479)***	–0.052 (0.025)**	–0.060 (0.044)
40th Quantile	0.000 (0.024)	5.195 (0.306)***	4.031 (0.107)***	–6.137 (1.598)***	–0.662 (0.343)*	–1.411 (0.428)***	–1.417 (0.493)***	–0.008 (0.031)	–0.007 (0.015)
60th Quantile	0.563 (2.516)**	9.961 (1.287)***	5.485 (0.633)***	11.060 (4.368)**	0.717 (0.472)	0.290 (0.522)	0.085 (0.529)	0.036 (0.035)	0.029 (0.013)**
80th Quantile	2.516 (0.575)***	17.960 (1.697)***	10.020 (1.197)***	31.000 (4.163)***	2.276 (0.584)***	1.001 (0.642)	1.702 (0.637)***	0.091 (0.048)*	0.078 (0.016)***
Number of observations	159	308	322	291	127	109	128	80	123
<i>Panel B: emerging economies</i>									
2008–2009 crisis dummy:									
Average effect	–1.906 (0.585)***	–11.210 (1.848)***	–1.414 (0.866)	13.700 (4.336)***	2.930 (0.708)***	2.961 (0.902)***	–0.089 (0.672)	0.258 (0.050)***	0.157 (0.033)***
20th Quantile	–1.502 (0.399)***	–2.963 (0.951)***	0.016 (0.679)	11.290 (4.756)**	2.370 (0.684)***	1.503 (0.891)*	–0.199 (0.830)	0.195 (0.050)***	0.043 (0.070)
40th Quantile	–0.797 (0.348)**	–5.509 (1.446)***	0.715 (1.091)	14.980 (5.609)***	2.502 (0.930)***	2.265 (0.806)***	–0.289 (0.801)	0.208 (0.045)***	0.111 (0.033)***

60th Quantile	−0.709 (0.701)	−10.700 (1.996)***	0.180 (1.246)	4.328 (5.840)	2.921 (0.850)***	2.515 (1.111)**	0.732 (0.945)	0.200 (0.062)***	0.151 (0.038)***
80th Quantile	−1.897 (1.212)	−14.540 (5.233)***	−1.767 (1.868)	15.960 (9.685)	3.912 (1.0172)***	5.909 (1.874)***	−0.326 (1.143)	0.281 (0.077)***	0.198 (0.032)***
Constant:									
Average effect	1.940 (0.429)***	12.560 (1.303)***	6.115 (0.605)***	7.361 (3.086)**	1.176 (0.551)**	0.080 (0.740)	−1.390 (0.521)***	0.028 (0.042)	−0.009 (0.026)
20th Quantile	0.000 (0.258)	0.000 (0.869)	0.000 (0.229)	−13.480 (3.624)***	−0.891 (0.496)*	−1.679 (0.690)**	−3.252 (0.383)***	−0.059 (0.038)	−0.034 (0.061)
40th Quantile	0.352 (0.249)	5.195 (1.154)***	3.064 (0.806)***	−5.084 (4.610)	0.675 (0.710)	−0.577 (0.635)	−1.752 (0.627)***	−0.008 (0.038)	−0.007 (0.012)
60th Quantile	1.024 (0.651)	10.700 (1.976)***	6.042 (1.069)***	16.180 (4.375)***	1.499 (0.607)**	0.448 (0.642)	−1.196 (0.769)	0.042 (0.043)	0.019 (0.018)
80th Quantile	3.587 (1.110)***	20.000 (4.751)***	9.729 (1.681)***	29.170 (5.168)***	3.044 (0.859)***	1.432 (1.108)	1.054 (0.791)	0.126 (0.054)**	0.076 (0.021)***
Number of observations	95	157	164	156	71	61	70	57	73

This table shows OLS and 20th, 40th, 60th, and 80th quantile regressions of different policy variables against a 2008–2009 crisis dummy. Panel A includes all available economies; panel B includes only emerging economies. “Average effect” corresponds to the OLS regressions. In the case of the 2008–2009 crisis, policy variables are calculated for the 2007–2009 period. FX means foreign exchange. See the main text and Fig. 4 for more details on the calculation of the wealth effects. For each variable, the top and bottom 5 percent of observations are excluded as outliers. *, **, and *** mean significance at the 10%, 5%, and 1% levels, respectively.

We complement the above analysis by running quantile regressions to check whether there is a significant change in some key quantiles of the distributions (Table 5). We focus on the 20th, 40th, 60th, and 80th quantiles, and also report the change in the average values of the distributions. In particular, we pool the information of the variable of interest across crises and run quantile regressions on a constant and a dummy variable taking the value of one during the 2008–2009 crisis. The constant is interpreted as the level of the j th quantile of the variable of interest during the Asian and Russian crises, and the coefficient on the dummy variable represents the change in the location of that quantile between the 2008–2009 crisis and the Asian and Russian crises.²² We find that there are statistically significant changes in most quantiles of the distributions. For example, all quantiles and the mean show a significant improvement in the debt and equity wealth effects during the 2008–2009 crisis relative to the Asian and Russian crises (except for the 20th quantile of the equity wealth effect). Likewise, there is a significant decline (although to varying degree of significance) in money market rates in all quantiles.

Overall, the above findings show a significant change in the stance of policies during the 2008–2009 crisis relative to the Asian and Russian crises. Although these are encouraging results, they are based on the sample of all economies, some of whom were not strongly affected by the Asian and Russian crises but were so during the 2008–2009 crisis. This observation could be biasing the results toward finding a significant change in policies for the simple reason that during the 1990s several economies did not have the need to conduct countercyclical policies. For that reason, we restrict the sample to emerging economies. Arguably, this set of economies suffered output declines both during the Asian and Russian crises and the 2008–2009 crisis.

Quantile regressions within the group of emerging economies (Table 5) show important changes in policies in these countries as well. For example, there is a significant decline in the average money market rates and the 20th, 40th, and 80th quantiles (the latter at the 10 percent significance level). Emerging economies expanded their fiscal expenditures during the 2008–2009 crisis, resulting in statistically significant increases in the average effect (of about 3 percentage points of GDP) and in all quantiles. The size of the coefficients on the 2008–2009 crisis dummy increases for higher quantiles, implying both a shift to the right and a spread of the distribution. Consider, for example, the typical economies located in the 20th and 80th quantiles of the distribution of changes in fiscal expenditures during the Asian and Russian crises. During the 2008–2009 crisis, the economies in the 20th quantile increased fiscal expenditures by about 1.5 percentage points of GDP relative to an increase of almost 6 percentage points observed in the economies in the 80th quantile. We also find significant improvements in the average effect and in all quantiles of debt and wealth effects. Furthermore, densities analogous to those in Fig. 4 but for the group of emerging economies yield similar conclusions.²³

5. Conclusions

Contrary to common perceptions, emerging economies were hit by the global crisis as much as advanced economies. As the world economy collapsed, both emerging and advanced economies witnessed declines in growth rates of similar magnitude when compared to their own pre-crisis rates, even when emerging economies kept growing at a higher rate than advanced economies. Furthermore, because the size of the collapse in each economy explains a significant part of the post-crisis performance, the rebound from the crisis was similar in emerging and advanced economies. One sign of resilience for emerging economies is that they started their recovery earlier than advanced economies, returning to their higher pre-crisis growth rates and, consequently, converging faster to their long-run output trend. Still, there is significant heterogeneity among emerging economies, with Eastern Europe

²² The level of the j th quantile of the variable of interest in the 2008–2009 crisis is recovered by adding the constant and the coefficient on the dummy variable.

²³ These densities (not reported in the paper) show that emerging economies were more able to decrease their money market rates and increase government expenditures as a fraction of GDP during the 2008–2009 crisis relative to the past. Moreover, while about 50 percent of the economies contracted government expenditures as a fraction of GDP, only 22 percent did so during the 2008–2009 crisis. Furthermore, emerging economies enjoyed more positive wealth effects, both in equity and debt, relative to the Asian and Russian crises.

and Central Asia faring much worse. The crisis seems to have been transmitted mostly through trade and financial factors, which likely contributed to the better performance of the less-connected low-income economies.

The evidence suggests that it was difficult for emerging economies to decouple from the world economy at the same time that they were part of the global production system, used foreign funds to finance investments, and held assets abroad. Any significant collapse in global demand and financial centers was likely to get transmitted to all economies linked to them. The faster recovery of IP in emerging economies could be partly explained by a recomposition of inventories that were initially depleted and needed restocking once it became obvious that the world economy would eventually stop its freefall.

Notwithstanding the large collapse, emerging economies indeed made progress during the 2000s not so much relative to advanced economies but relative to their own past. Namely, emerging economies were able to become more similar to advanced economies and therefore the 2008–2009 external shock was not magnified. While during past crises emerging economies fell more than advanced economies with the financial system and the public sector amplifying the shock, this time the two groups of economies fell similarly. Furthermore, emerging economies were able to use a wide range of countercyclical policies. While these tools have been available to advanced economies for a long time, emerging economies had to overcome their past history of procyclicality. The good stance of emerging economies before the global crisis and the policies implemented during it were likely reflected in their improved performance.

To conclude, the continuing integration in global trade and global financial markets poses a trade-off to emerging economies. While integration tends to be associated with higher growth and other positive spillover effects, it also makes economies susceptible to foreign shocks and contagion effects. This vulnerability makes the lessons from the global crisis more telling. Emerging economies will probably try to keep improving their external positions, expanding their fiscal space, reducing credit mismatches, building buffers in the financial system, and gaining credibility in their monetary policy among other things. These policies seemed to have helped during the global downturn and the incentives to continue them only became more obvious. Unfortunately, some of these countercyclical policies entail pecuniary and opportunity costs, like those related to hoarding reserves, developing local currency and long-term debt markets, and slowing down the growth rate of credit and consumption. Moreover, the actions by some economies may have negative spillover effects. For example, by limiting foreign capital some economies might push capital to flow to neighboring economies, exerting additional upward pressure on their domestic currencies during good times. Having a broad framework to understand the general equilibrium effects (within and across economies) of the policies adopted to deal with globalization and crises is an avenue for fruitful new research.

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