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**Working Paper**

## Recessions and recoveries in Asia: What can the past teach us about the present recession?

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## **ADB Working Paper Series**

### **Recessions and Recoveries in Asia: What Can the Past Teach us About the Present Recession?**

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Souvik Gupta and  
Jacques Miniane

No. 150  
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**Asian Development Bank Institute**

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**Abstract**

With the global economy still in recession, two important questions arise for Asia: how soon will the recession end, and how vigorous will the region's recovery be? The purpose of this paper is to look at past recessions and recoveries in Asia in order to shed light on these issues. Several important stylized facts emerge from this study: (i) recessions accompanied by financial stress—notably, stress in domestic banking sectors—have been substantially longer and deeper than the norm, suggesting that the current recession could have been even costlier and more drawn out had Asia's banks not entered the downturn in such strong shape; (ii) recoveries in Asia have been weak because they were typically driven by a single engine: exports. In contrast, other emerging economies have tended to experience more vigorous recoveries because of a stronger contribution from domestic demand, notably investment; (iii) in Asia, deep recessions have resulted in substantial declines in potential output growth, meaning that their effects are not just cyclical but permanent. A clear lesson emerges from past experience: given the expected weak recovery in the eurozone and the United States, Asia should not count on exports to rebound strongly as it did in previous upturns. Rather, a fundamental rebalancing towards domestic demand is needed if Asia wants to preserve the high growth rates that have characterized its recent past. Finally, it remains to be seen whether potential output will fully recover from pre-crisis levels in the countries most affected by the crisis.

**JEL Classification: E32, E65, G01**

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## 1. INTRODUCTION

The world at large is still in recession, as are a number of Asian countries. With external demand for Asia's products vanishing as a result of a sharp deleveraging in advanced economies, export and industrial production growth in the region plunged in late 2008 to unimaginable levels. In turn, weakness in exports spilled over to domestic demand, with investment in particular showing signs of decline at a high rate. Major policy efforts in Asia and abroad appear to have averted the worst, and there are now some tentative signs of stabilization.

In this context, two key questions emerge: how soon will the recession end, and how vigorous is the recovery likely to be? The purpose of this paper is to look at past recessions and recoveries in Asia in order to shed light on these important questions.<sup>1</sup> In particular, we look at past episodes and assess how long and deep the typical recession has been, why some recessions have been noticeably longer and deeper, if and why some countries within Asia have suffered deeper recessions than others, how strong or weak have recoveries typically been, and what leads these recoveries.

The key findings of this paper can be summarized as follows:

- Recessions accompanied by financial stress—notably, stress in domestic banking sectors—are substantially longer and deeper than the norm. The fall in credit deprives corporations of working capital and households of the means to smooth consumption, greatly exacerbating the downturn that may have been under way.
- Recoveries in Asia have been weak because they were typically driven by a single engine: exports. In contrast, other emerging economies have tended to experience more vigorous recoveries because of a stronger contribution from domestic demand, notably investment.
- In Asia, deep recessions have resulted in substantial declines in potential output growth, meaning that their effects are not just cyclical but permanent.

In other words, had Asian banks not entered the recession with such strong balance sheets, the current recession, already among the most severe in recent decades, could have been substantially deeper and longer. Given the expected weak recovery in the eurozone and the United States (US), Asian countries should not count on exports to rebound rapidly as they have in past recoveries—a slow return to pre-crisis growth levels looks to be the more likely outcome at this stage. In this context, fiscal and monetary stimuli in the region are welcome to help sustain the recovery. More fundamentally, given the risk that the eurozone's and the US' growth might be less consumption-driven in the medium-term, many economies in Asia will need structural reforms such as expansion of social safety nets in order to become less export dependent and sustain healthy growth rates going forward.

The rest of this paper is structured as follows. Section 2 explains the methodology used to identify recessions and recoveries, and reviews some of their general characteristics. Section 3 looks at past recessions in Asia with emphasis on two questions: what distinguishes the most severe recessions, and whether some countries are more vulnerable than others. Section 4 looks at past recoveries in Asia, showing in particular why they have tended to be weak compared with recoveries in other regions. Section 5 discusses policy responses and their effects in past recessions, and Section 6 gives concluding remarks.

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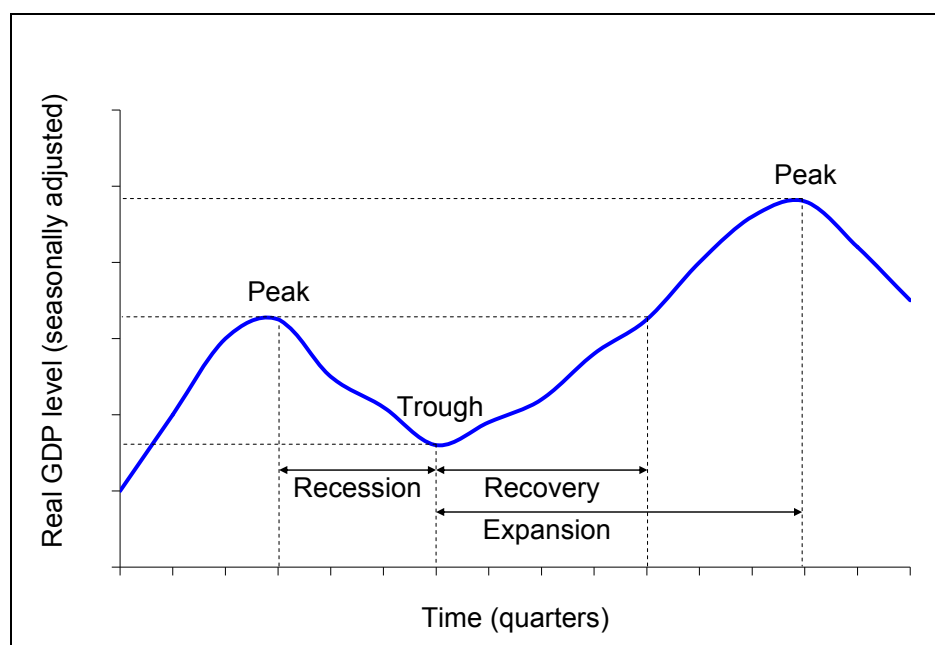
<sup>1</sup> While some papers such as Kim, Kose, and Plummer (2003) have looked at business cycle dynamics in Asia, there are fewer studies looking specifically at recession and recovery episodes in the region. One of these is Hong, Lee, and Tang (2009), who use annual rather than quarterly data as is done in this paper. The use of annual data allows the authors to cover a longer data span, but at the cost of a less precise identification of business cycle turning points and hence the dynamics of different components around these key dates.

## 2. PRELIMINARY CONSIDERATIONS

In a study of recessions and recoveries, the first obvious question is: what type of recession? The academic literature typically distinguishes between classical recessions, which entail a decline in GDP *levels*, and growth slowdowns, which deal with declines in GDP *growth*. This paper focuses on classical recessions, mainly because most economies in the region are expected to experience declines in GDP levels in the current cycle.

Recession episodes are identified through an extension of the “two-quarters-of-negative-growth” rule. As general terminology, a “recession” begins when the level of GDP starts declining after a “peak” and ends when the level of GDP reaches a “trough.” A “recovery” begins when the level of GDP starts rising after the trough and ends when the level of GDP returns to its peak level; an “expansion” lasts until GDP reaches its next peak (Figure 1). This paper identifies peaks and troughs by means of the Bry-Boschan (1971) algorithm, which has become standard methodology in the study of classical recessions.<sup>2</sup> Strictly speaking, the algorithm does not require two consecutive quarters of negative growth after a peak to identify a recession, but it does require GDP growth to be negative over the combined two-quarter period following the peak.

**Figure 1: Recessions, Recoveries, and Expansions**



This paper also differentiates recessions alongside various dimensions that appear relevant at the current juncture. We define a financial crisis recession as a recession episode associated with a domestic banking crisis (as identified in Laeven and Valencia [2008]), or as a recession associated with higher-than-normal levels in our measure of global financial conditions (the financial stress index for advanced economies used in Cardarelli, Elekdag, and Lall [2009]).<sup>3</sup> We also differentiate between export recessions—defined as those during which export levels fall by at least 5% relative to peak level—and nonexport recessions. One objective of this paper is to assess whether there are clear differences in length, depth, and dynamics between financial stress and nonfinancial stress recessions, and between export and nonexport recessions.

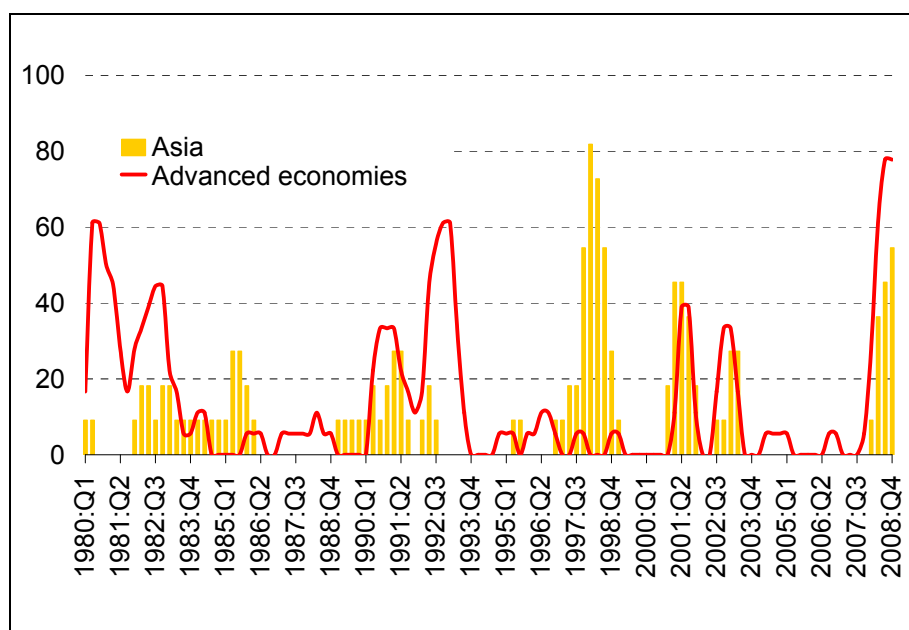
<sup>2</sup> See the Appendix for details on the Bry-Boschan algorithm.

<sup>3</sup> See the Appendix for details on the construction of the global Financial Conditions Index, as well as the banking crisis indicator.

The sample of recessions identified in this paper is quite diverse, with one surprising finding: export shocks have been an important but not the main cause of recessions in Asia. Limiting our analysis to the post-1980 period because of rapid changes in economic structure in the region, we identify 33 recessions in the Asian economies in the sample, excluding the current recession ongoing in several of these economies.<sup>4</sup> Of these 33 recessions, 10 occurred in industrialized Asian and Pacific economies—Japan, Australia, and New Zealand—and 23 in emerging Asian economies (see Table A1 in the Appendix). Of note is that no classical recession occurred in the People’s Republic of China (PRC) or India during the sample period. Seventeen out of the 33 recessions are associated with financial stress, but only 7 of these 17 coincided with a banking crisis. The latter have typically resulted from the bust of large imbalances in the domestic economy, as was the case in Japan in the 1990s or in the Asian crisis. Finally, 8 of the 33 were export recessions according to our definition, suggesting that export shocks have been an important but far from exclusive driver of recessions in the region. Needless to say, the current recession in Asia—which, again, is not included in this study—is, first and foremost, an export recession.

Asia’s business cycles appear increasingly coordinated with global business cycles. The incidence of recessions in Asia has by and large been uncorrelated with the incidence of recessions in advanced economies, either contemporaneously or with lags, when measured over the whole sample (Figure 2). At the same time, every US recession has coincided with at least 20% of the Asian economies in our sample being in recession, and often more (Figure 3). Moreover, the correlation between the incidence of recessions in Asia and globally appears to have increased over the past decade, a possible consequence of Asia’s deepening integration with the global economy.<sup>5</sup>

**Figure 2: Recession Timeline since 1980  
(Percent of in-sample economies in recession)**



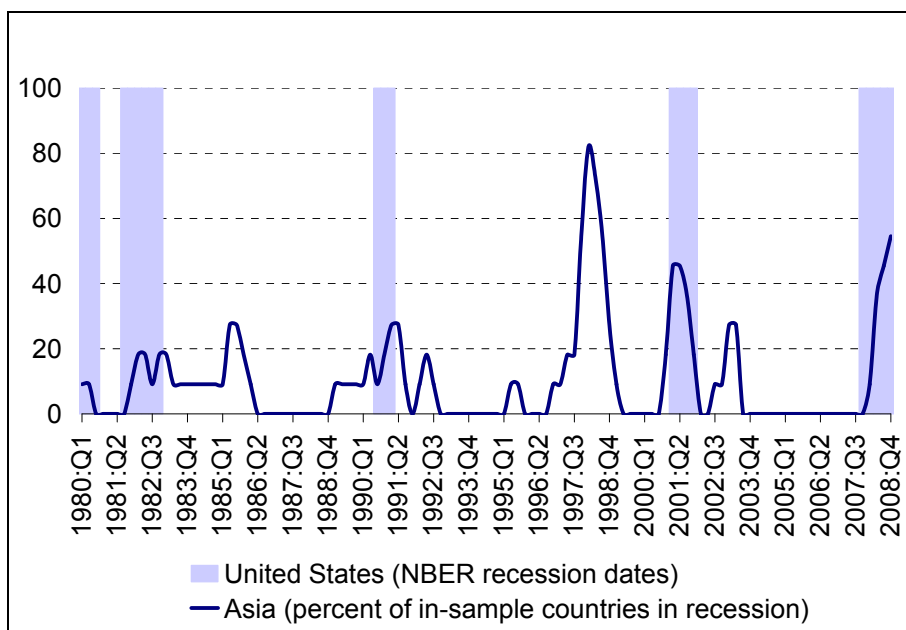
Source: IMF staff estimates.

<sup>4</sup> We exclude the current recession precisely because it is still ongoing and hence of unknown depth and duration. Note that Viet Nam was excluded from the sample because its quarterly GDP series is too short and appears too smooth.

<sup>5</sup> See Guimarães-Filho et al. (2008) for discussion on Asia’s deepening integration with the global economy.



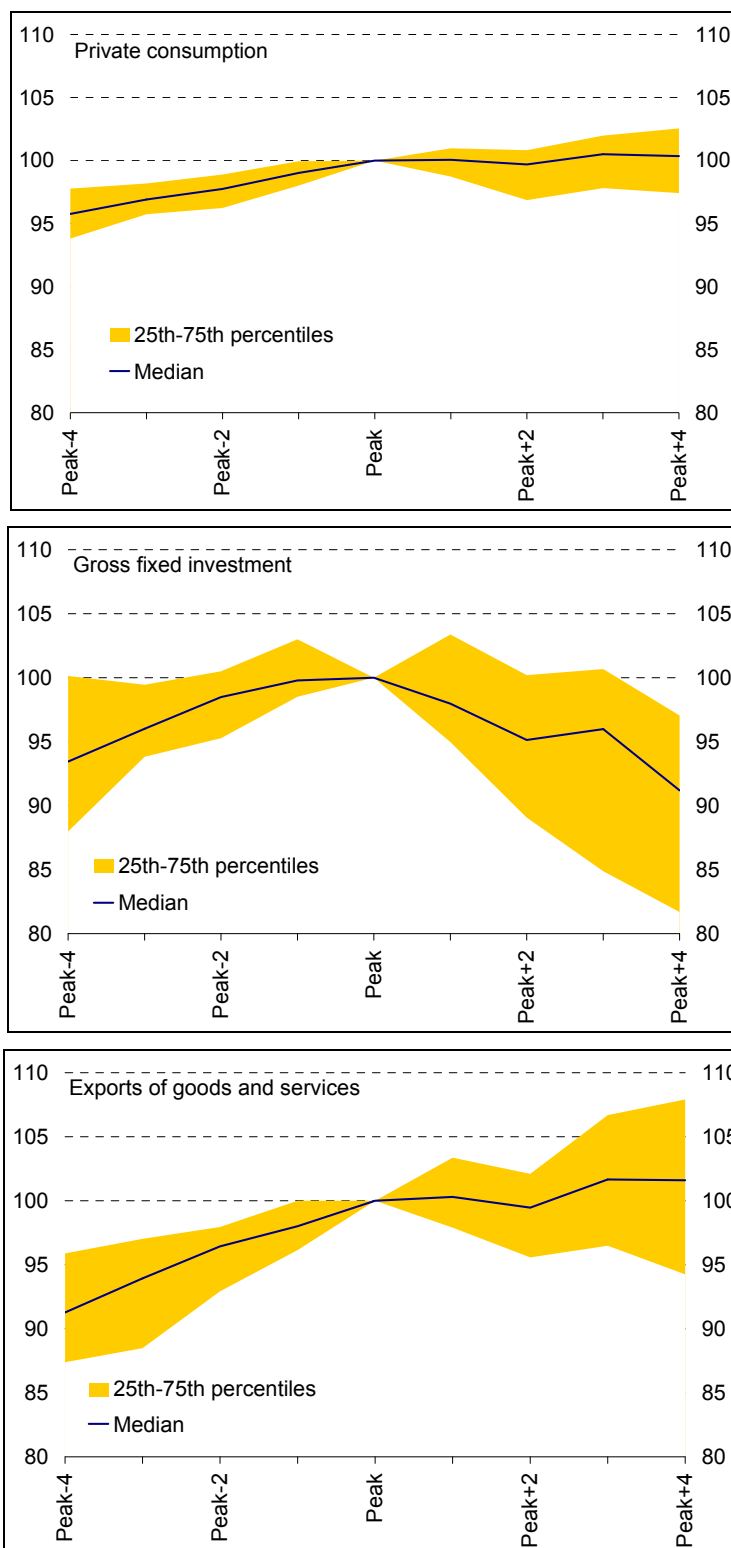
**Figure 3: Asia and United States: Recession Timeline since 1980**



Sources: National Bureau of Economic Research (NBER); and IMF staff estimates.

Finally, recessions in Asia have had one common characteristic, regardless of the shock that caused them: investment tends to decline during a recession. Looking across all recessions, exports do not appear to have fallen on average, nor does consumption. Investment, however, falls with high probability (Figure 4). Why? The reason has to do with the fact that investment is tied both to exports and to domestic demand, and it suffers when recessions are caused by shocks to export demand, shocks to consumption, or shocks to financial conditions. Indeed, contrary to consumption and exports, investment fell both in the 1997–1998 and the 2000–2001 recession, which at their roots were very different.

**Figure 4: Asia: Previous Recessions since 1980  
(Median real level, peak of the recessions = 100)**



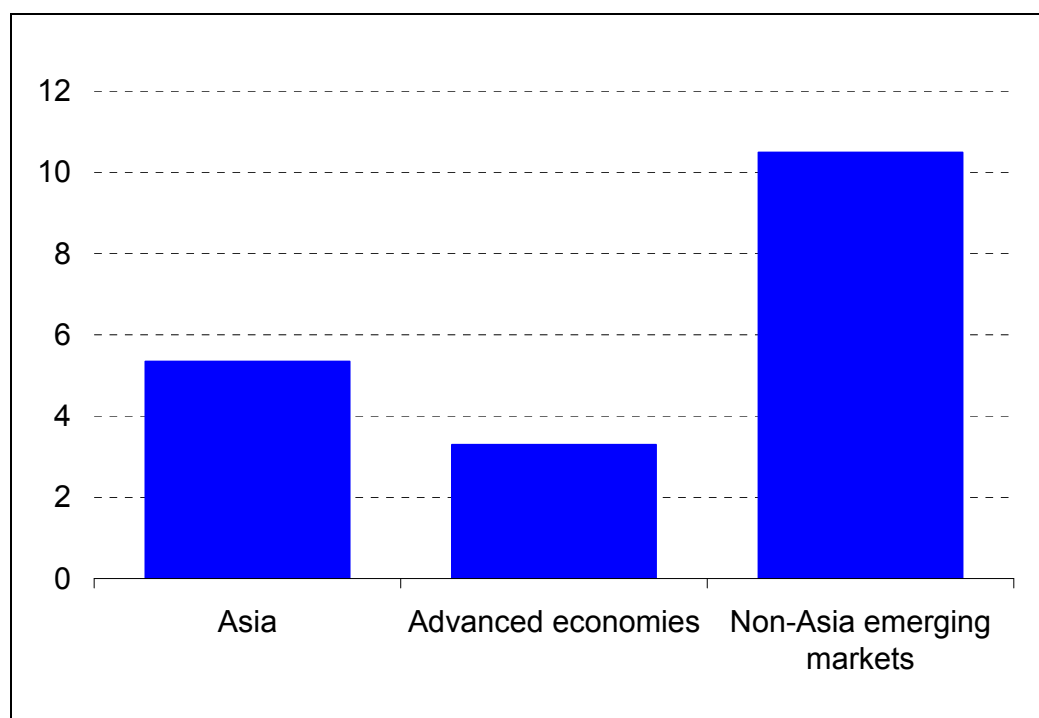
Source: IMF staff estimates.

### 3. RECESSIONS IN ASIA: HOW LONG AND DEEP?

#### 3.1 Are Some Recessions Deeper Than Others?

In Asia, recessions have typically been neither very long nor very deep. The median duration of recessions in Asia has been three quarters, similar to those in advanced economies as well as in non-Asia emerging markets. In terms of the cumulative output loss during a recession, Asian episodes have been more costly than those in advanced economies—the median loss during an Asian recession has been around 5% of peak GDP, compared with about 3% in advanced economies (Figure 5). This is consistent with the considerable literature showing that emerging markets are exposed to larger and more persistent volatility than advanced economies—see Aghiar and Gopinath (2007) among others—owing to the former’s less diversified economic structures and their limited ability to use domestic financial systems or international markets to smooth the impact of shocks. At the same time, recessions in Asia have been less costly than in other emerging markets, where the median cumulative loss has been about 10% of peak GDP.<sup>6</sup>

**Figure 5: Cumulative Output Loss in Previous Recessions since 1980  
(Median, in percent)**



Source: IMF staff estimates.

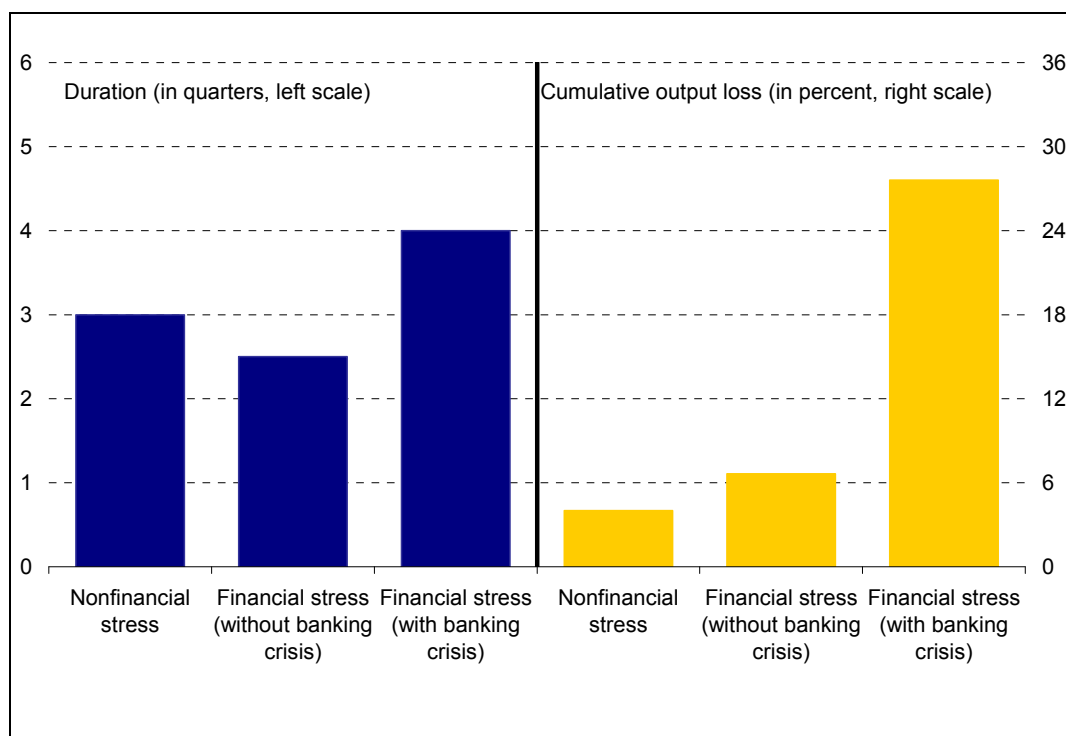
Yet these median statistics mask an important fact: a substantial number of recessions in Asia have been both long and very deep. In particular, 25% of recessions in Asia (i.e., 9 of the 33) have lasted longer than a full year and entailed cumulative output losses larger than 12% of peak GDP, more than double the median loss.

These long and deep recessions are all associated with financial stress. Indeed, when we separate our sample between financial stress and nonfinancial stress recessions, the former led to output losses 8% of GDP higher in the median. At the same time, it is important to

<sup>6</sup> Given Asia’s higher trend growth pre-crisis, however, it is not clear that recessions in Asia have been less costly if measured not in terms of output loss relative to peak, but in terms of the output gap. We did not use the output gap as a measure of the cost of recessions because of the difficulty in properly estimating potential output during a recession.

note that not all financial stress matters statistically for the length and depth of recessions. Recessions associated with global financial stress that were not accompanied by a domestic banking crisis are barely different in their severity to recessions with no financial stress, at least in our sample. It is recessions associated with banking crises that are of a more severe order of magnitude, entailing a 20% of GDP higher median cumulative output loss (Figure 6).<sup>7</sup> Indeed, the recessions in our sample with the largest 25% output losses were all associated with a banking crisis.

**Figure 6: Asia: Previous Recessions since 1980  
(Median)**

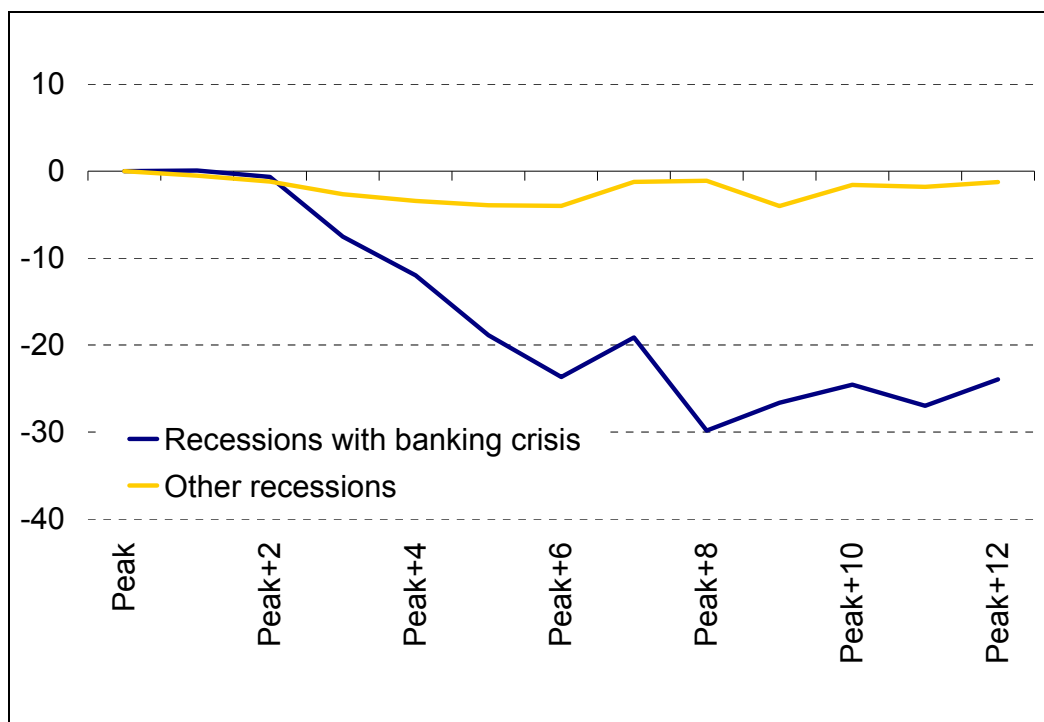


Source: IMF staff estimates.

Credit curtailment appears to be the channel through which bank impairment amplifies recessions. In the case of Asia, credit growth remains by and large unaffected during standard recessions, but plummets during banking crises. At its lowest point during these recessions, median credit growth is 30 percentage points below its level before the recession started (Figure 7). Therefore, firms are deprived of working capital and consumers of the means to smooth consumption, explaining why the two decrease substantially more during banking crises. The relationship between credit and the real economy, however, should in no way be seen as uni-directional: banking crises are themselves caused by severe stresses in the real economy. What matters, then, is the feedback loops between real shocks and credit.

<sup>7</sup> This result thus confirms for Asia what had been previously found for advanced economies in general in Cardarelli, Elekdag, and Lall (2009) and Reinhart and Rogoff (2009).

**Figure 7: Asia: Credit to Private Sector during Previous Recessions since 1980  
(Median, year-on-year percent change, peak of the recessions =0)**



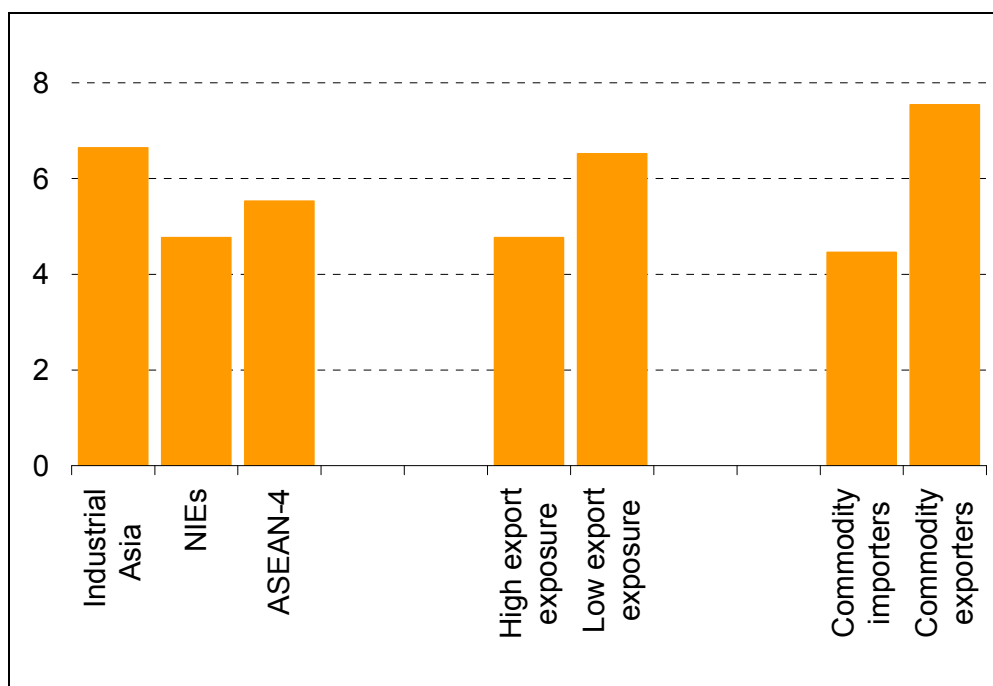
Source: IMF staff estimates.

The lesson for the current cycle is clear. While the region has suffered from the global reappraisal of risk in the form of capital outflows, declines in equity prices, and tight domestic liquidity conditions among other symptoms, core banking systems have remained stable and have been able to re-intermediate credit in the face of limited external funding. Without this stability, the current recession, already of historical proportions owing to the size of the external shock, would most certainly have been even longer and deeper.

### 3.2 Do Some Economies Suffer Deeper Recessions?

Different economies in Asia seem to suffer comparable recessions on average. Decomposing Asian economies in different subgroups—regional groupings, commodity importers versus exporters, high export exposure versus low export exposure, etc.—does not signal major differences in median duration or output loss of recessions across groups (Figure 8). Commodity exporters—Australia, New Zealand, Indonesia, Malaysia—seem to suffer deeper losses, but this is because two of the three recessions in Indonesia and Malaysia were banking crises.

**Figure 8: Asia by Regional Groups: Cumulative Output Loss during Previous Recessions since 1980**  
(Median, in percent)



Industrial Asia = Japan, Australia, New Zealand; Association of Southeast Asian Nations (ASEAN)-4 = Indonesia, Malaysia, Philippines, Thailand; newly industrialized economies (NIEs) = Hong Kong, China; Korea; Singapore; Taipei, China.

Source: IMF staff estimates.

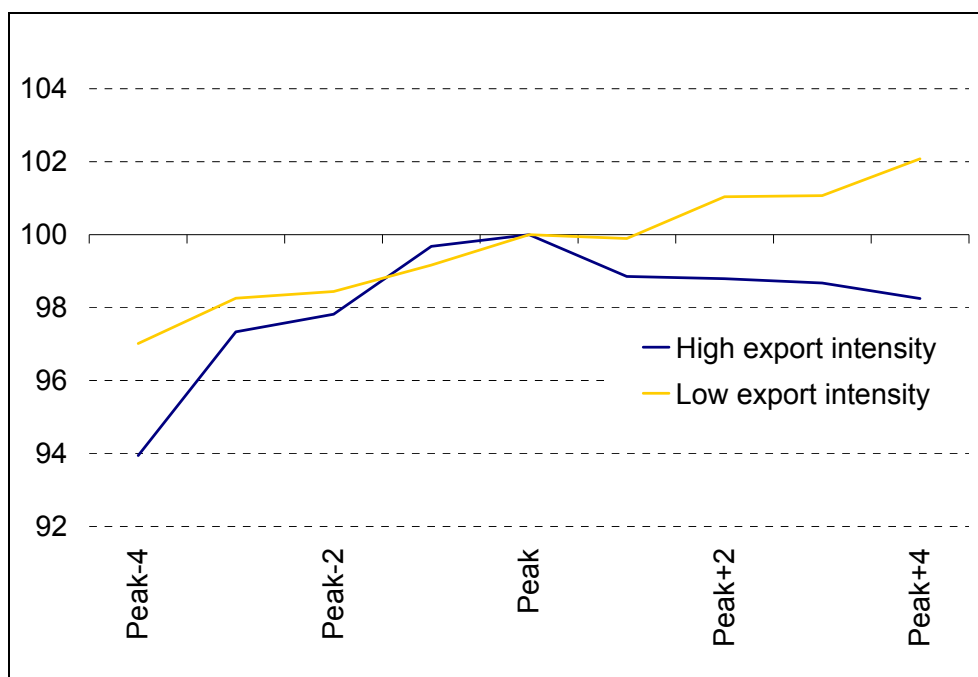
However, of relevance to the current context, export-dependent economies are doubly vulnerable to export shocks because their domestic demand seems less autonomous from the export cycle.<sup>8</sup> Not only did GDP fall by more in these countries during export recessions, but consumption and investment fell as well (Figure 9). Given the limited number of export-led recessions, we estimated the dynamic impact of export shocks on consumption and investment growth in the two sets of economies over the entire sample, by means of a panel vector autoregression (VAR).<sup>9</sup> The results confirm that export shocks have substantially larger effects in the high export exposure group. In terms of magnitude, a 15 percentage point decline in year-on-year growth of real exports—a decline of similar magnitude to that experienced in Asia in recent months—leads in the estimated model to a 6 percentage point decline in real investment growth in high export exposure countries, versus a 2 percentage point decline in low export exposure economies (Figure 10). Moreover, the impact in the former group is persistent, with investment growth returning to pre-shock levels only a year and a half after the shock. The impact on consumption growth is smaller in magnitude but still not trivial: in trade-dependent economies, consumption growth declines by about 1.5 percentage points following the shock.

<sup>8</sup> Highly export dependent economies are the newly industrialized economies (NIEs) and Malaysia. Low export dependent economies are Australia, Indonesia, Japan, New Zealand, Philippines, and Thailand. This classification uses data on Asian countries' direct and indirect export exposure to the US and the euro area presented in Guimarães-Filho et al. (2008).

<sup>9</sup> See the Appendix for details on the VAR.

**Figure 9: Asia by Type of Export Activity: Real Gross Domestic Product during 2000–2001 Recession<sup>a</sup>**

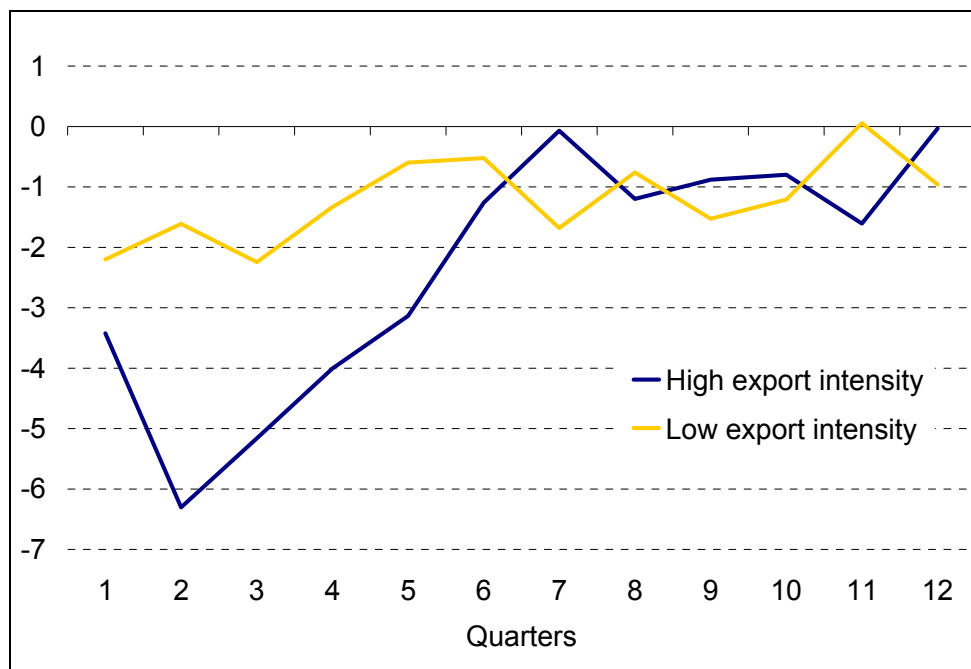
(Median level, peak of the recession =100)



<sup>a</sup> Includes countries that were not in recession in 2000–2001, excluding the People’s Republic of China and India.

Source: IMF staff estimates.

**Figure 10: Asia: Response of Real Gross Fixed Investment Growth to a Shock to Real Export Growth<sup>a</sup>**  
(In percentage points)



<sup>a</sup> A shock of 15 percentage points is considered here.

Source: IMF staff estimates.

Thus, past recession patterns yield two meaningful insights: (i) export-dependent economies are more vulnerable in the face of external demand shocks, and (ii) banking sector stress greatly amplifies recessions. What lessons can be learned from the pattern of past recoveries? This is the purpose of the next section.

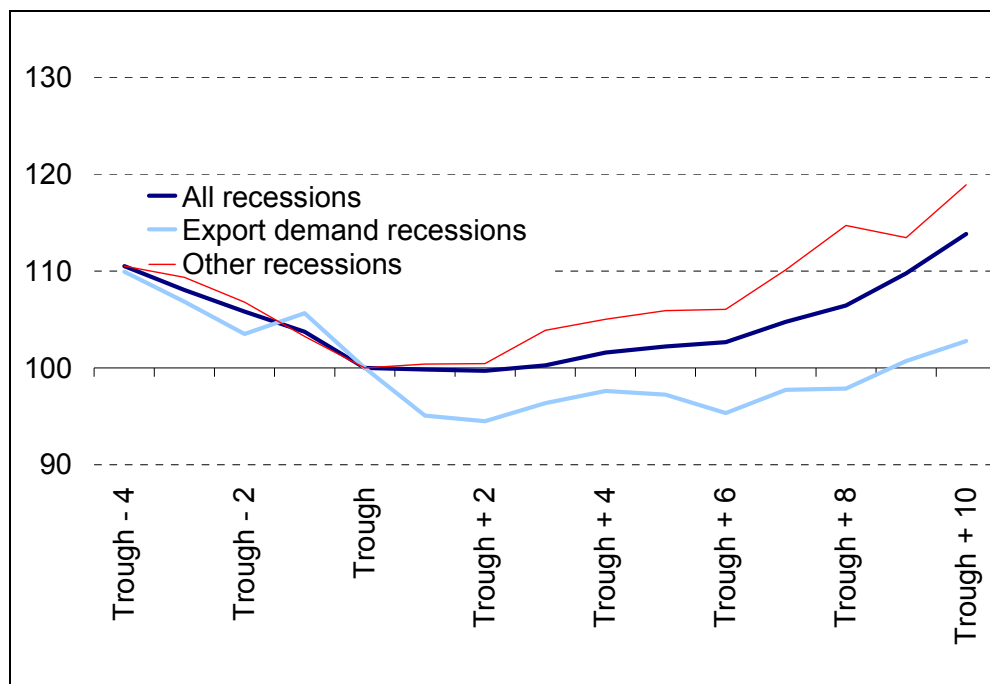
#### 4. PAST RECOVERIES: HOW VIGOROUS?

Patterns of recovery in Asia are relatively more homogeneous than those of recessions, and tend to be characterized by a strong rebound in exports and a relatively weak contribution from domestic demand. More specifically:



- Many recoveries in Asia have been “investment-less.” In the typical recovery, investment remains flat post-trough for about three quarters, and then picks up the pace very gradually (Figure 11). Moreover, only 4 out of the 33 recoveries in the sample were led by a recovery in investment, defined as an upturn in investment post-trough that preceded the upturn in consumption and exports. Why has investment been so sluggish to recover? Excess pre-recession capacity may be part of the answer. Numerous studies have pinned excess investment before the Asian financial crisis as one reason investment appeared to be so weak after the crisis.<sup>10</sup> In fact, the collapse of investment in Asia following the 1997–1998 crisis has often been cited as one of the root causes of the current account imbalances that have dominated the global economy in the past decade. Yet this crisis was not the only one during which investment failed to recover strongly. For instance, the recovery after the 2000–2001 recession was even weaker, with investment stuck at trough levels for a full three years.<sup>11</sup> Once again, excess capacity before the crisis, in this case concentrated in the information technology (IT) sector, led to weak investment after the crisis. It is an open and important question why investment in Asia appears to follow such pronounced boom and bust cycles.

**Figure 11: Asia: Real Gross Fixed Investment during Previous Recessions since 1980**  
**(Median level, trough of the recessions =100)**



Source: IMF staff estimates.

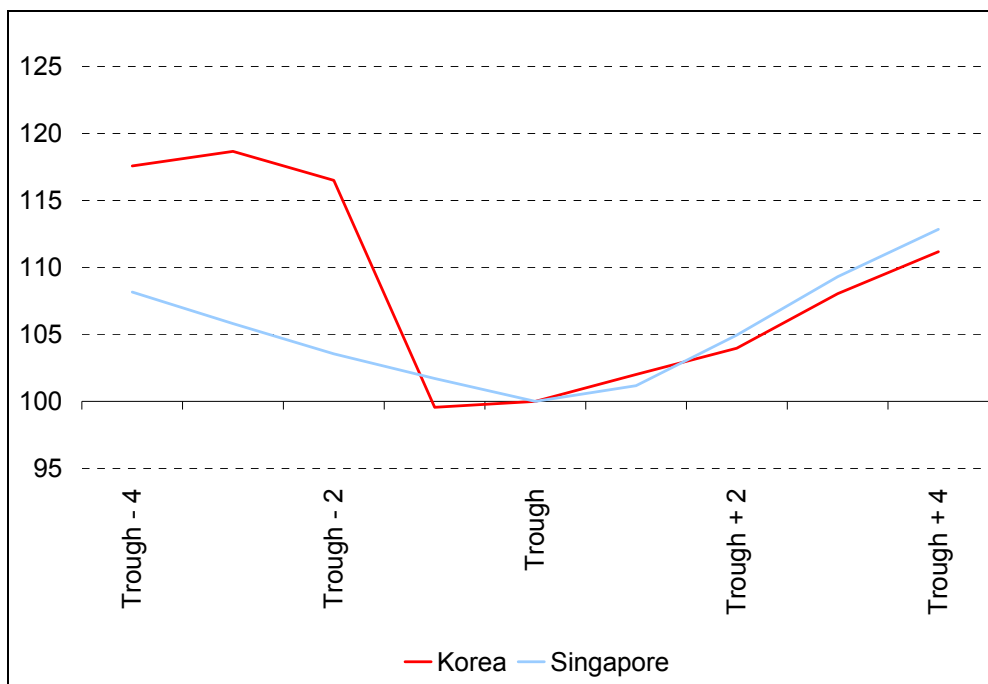
<sup>10</sup> See IMF (2006) among others.

<sup>11</sup> In some economies like Hong Kong, China, this could be due to the severe acute respiratory syndrome (SARS) recession coming quickly after the IT recession. Moreover, apparent weakness in the investment recovery post 2001 may have been exaggerated by the surge of regional foreign direct investment (FDI) flows toward the PRC in this period.

- Consumption played an important role in a limited number of recoveries.* Consumption recoveries led about 9 of the 33 GDP recoveries in the sample. Surprisingly, consumption led the recovery in several of the Asian-crisis episodes, for example in the Republic of Korea (hereafter Korea) and Singapore, and to a lesser extent in Thailand (Figure 12). This is in contrast with received wisdom that countries exited the Asian crisis thanks to sharp depreciations and export rebounds. This being said, it is doubtful that these consumption recoveries would have been sustainable had exports not recovered sharply soon after.

**Figure 12: Selected Asia: Real Private Consumption Expenditure During the Asian Crisis**

(Trough of the recession =100)

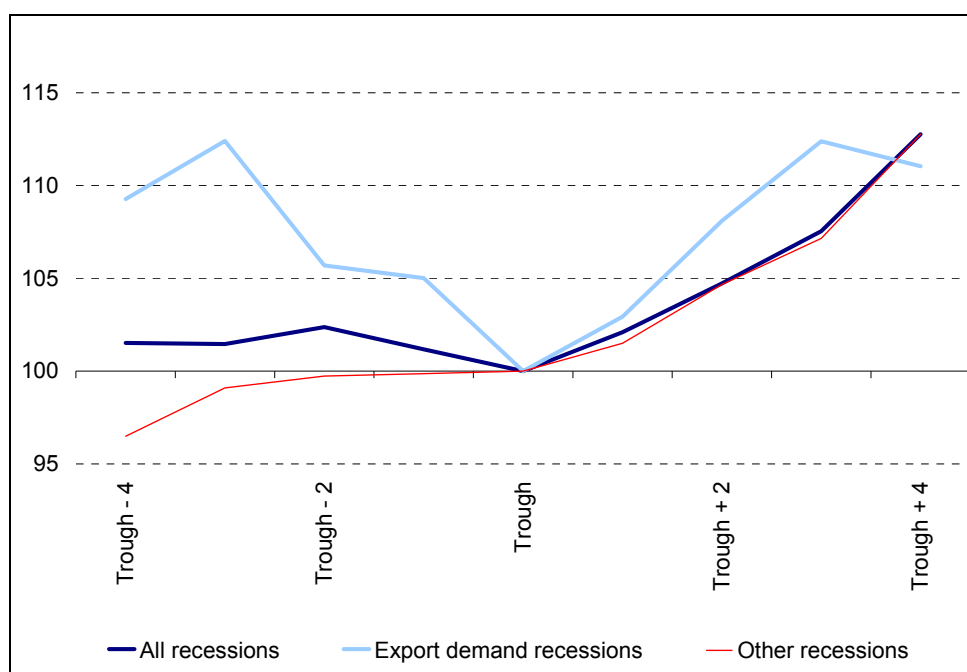


Source: IMF staff estimates.

- Exports, then, have been the main engine of recoveries in Asia.* In the recovery phase, exports tend to rebound strongly, with export volumes typically more than 10% higher than their trough levels four quarters on (Figure 13). Not only was the rebound in exports key to the recovery in many export recessions, but growth in exports also led GDP and the other demand components in 16 out of the other 25 recoveries (i.e., recoveries following non-export recessions).<sup>12</sup> Export rebounds appear to have been helped by currency depreciations, a common feature of Asian recessions, with stronger export recoveries associated with larger real effective depreciations in our sample (Figure 14). Finally, of relevance to the current context, most export rebounds in our sample happened in periods of better-than-acceptable growth in the United States and euro area (G-2). A clear case is the post-2001 rebound in Asian exports, which coincided with the recovery in the US and Europe from their own recessions. In other words, Asia never exited a recession through exports in our sample at a time of weak growth in the G-2.

**Figure 13: Asia: Real Exports of Goods and Services during Previous Recessions since 1980**

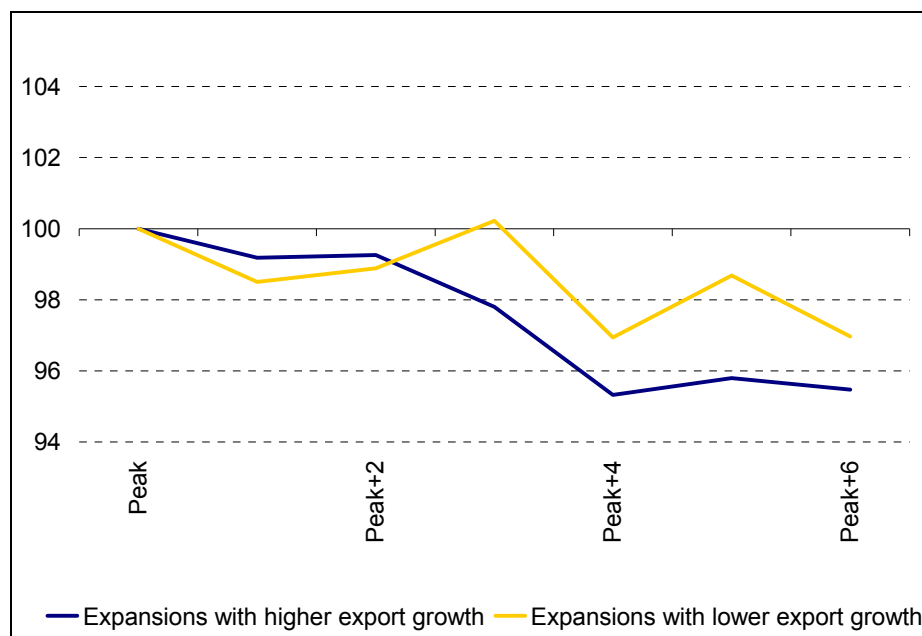
(Median level, trough of the recessions =100)



Source: IMF staff estimates.

<sup>12</sup> To summarize, 60% of recoveries were led by exports, 30% by consumption, and 10% by investment.

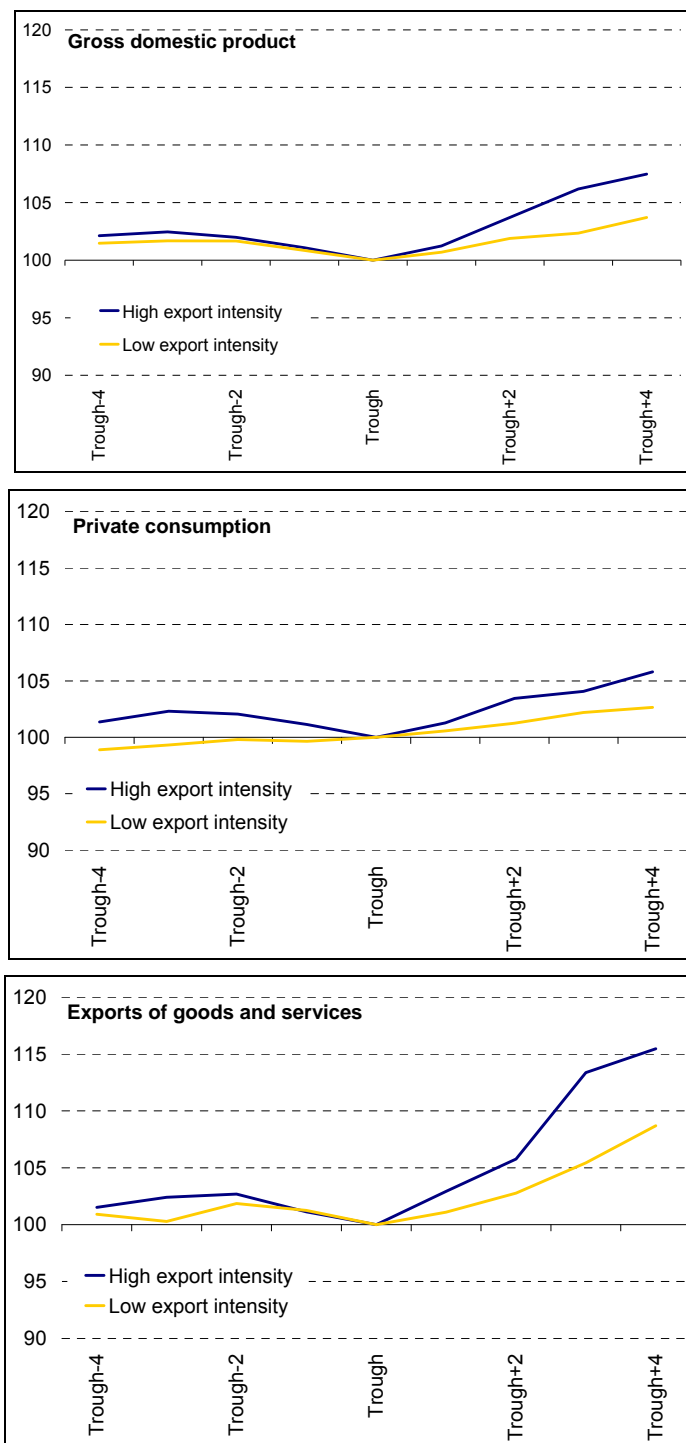
**Figure 14: Asia: Real Effective Exchange Rate during Previous Recessions since 1980  
(Median, peak of the recessions =100)**



Source: IMF staff estimates.

Given the importance of export growth in the recovery phase, this presents the question of whether export-dependent economies experience sharper recoveries. The answer is yes, both because the recovery in exports is sharper—perhaps owing to a higher elasticity of exports to foreign demand in these countries—and because the recovery in exports translates into a stronger recovery in domestic demand (Figure 15). Median GDP levels are 5 percentage points higher one year after the trough in high export exposure economies, and the difference cannot be explained by higher trend growth in this group.

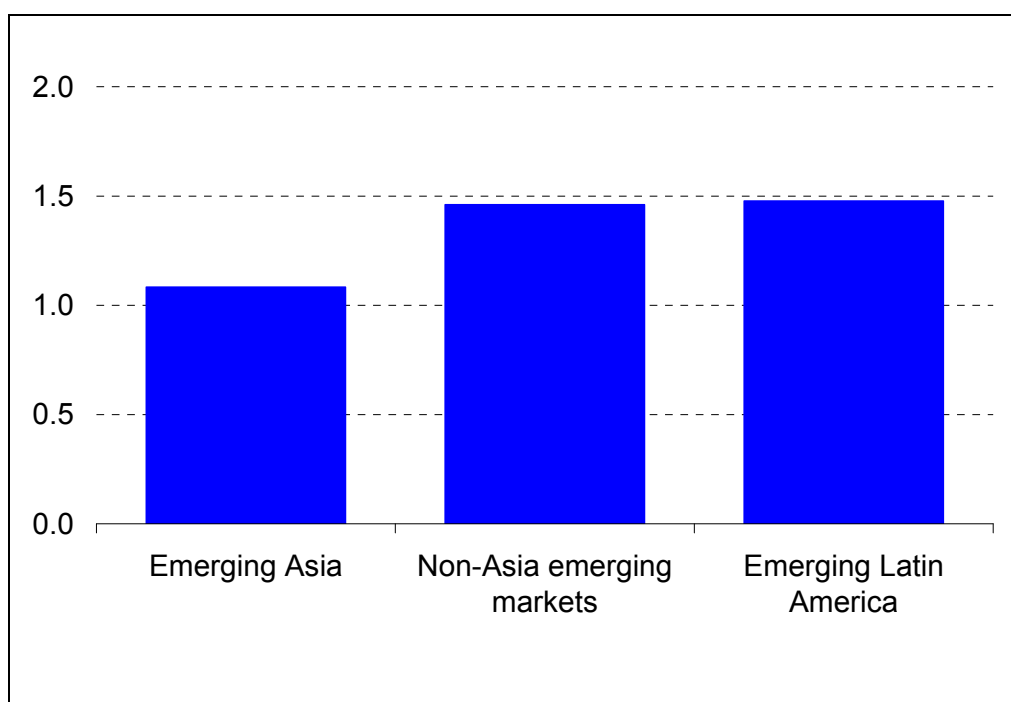
**Figure 15: Asia: Previous Recessions since 1980 by Type of Export Intensity of the Economies**  
**(Median real level, trough of the recessions = 100)**



Source: IMF staff estimates.

Because recoveries in Asia have typically relied on a single engine, they have tended to be weaker than in other regions. It typically takes emerging Asia three quarters to recover its recession output loss, when other emerging markets take two quarters to recover an output loss that was on average greater. Put differently, growth in the recovery phase in Asia is typically 0.5 percentage points lower per quarter (non-annualized) than in other emerging economies (Figure 16). A key difference is that non-Asia emerging economies typically benefit from a strong V-shaped recovery in investment.

**Figure 16: Average Quarterly Growth during Recovery Phase**  
(In percent, nonannualized)

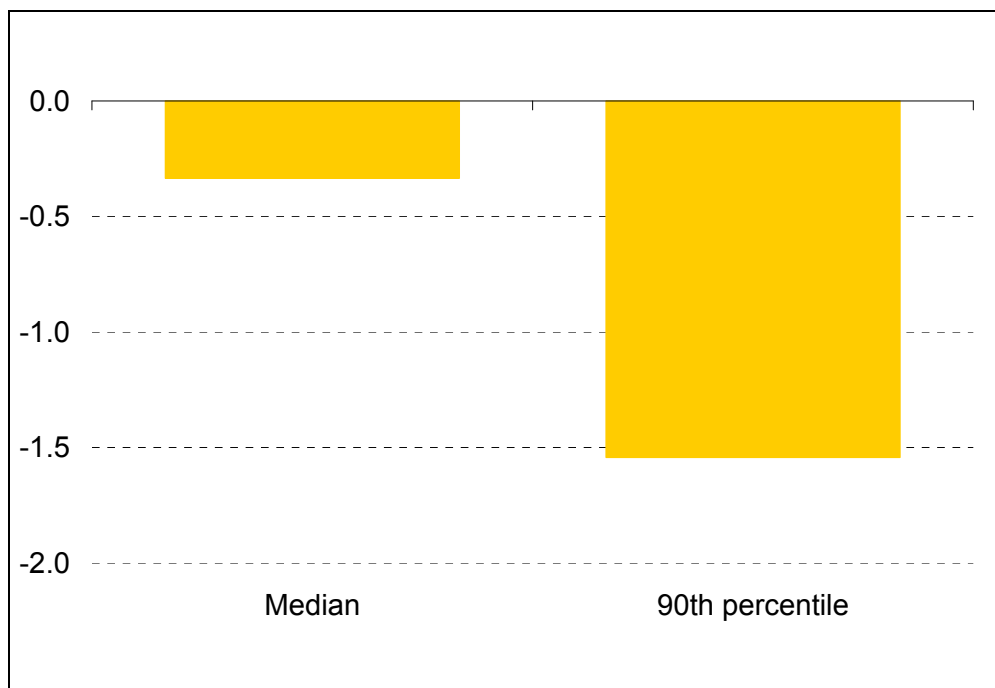


Source: IMF staff estimates.

Finally, are deeper recessions followed by sharper recoveries? The answer is a clear no. If output was trend stationary, a deeper recession could be followed by a sharper recovery. But the key is that deep recessions appear to entail permanent rather than just cyclical losses, violating the assumption of trend stationarity. In the deepest recession episodes, quarterly (annualized) potential output growth falls by some 1.5 percentage points, compared with about a one third percentage point in the median recession (Figure 17). The cumulative impact of such a decline is significant: a 1 percentage point decline in annualized quarterly trend growth means that GDP would be 10% lower after 10 years.

**Figure 17: Asia: Change in Trend GDP Growth during Previous Recessions since 1980<sup>a</sup>**

(In percent)



<sup>a</sup> Difference in average annualized quarterly growth between eight quarters before peak and eight quarters after trough of the recessions.

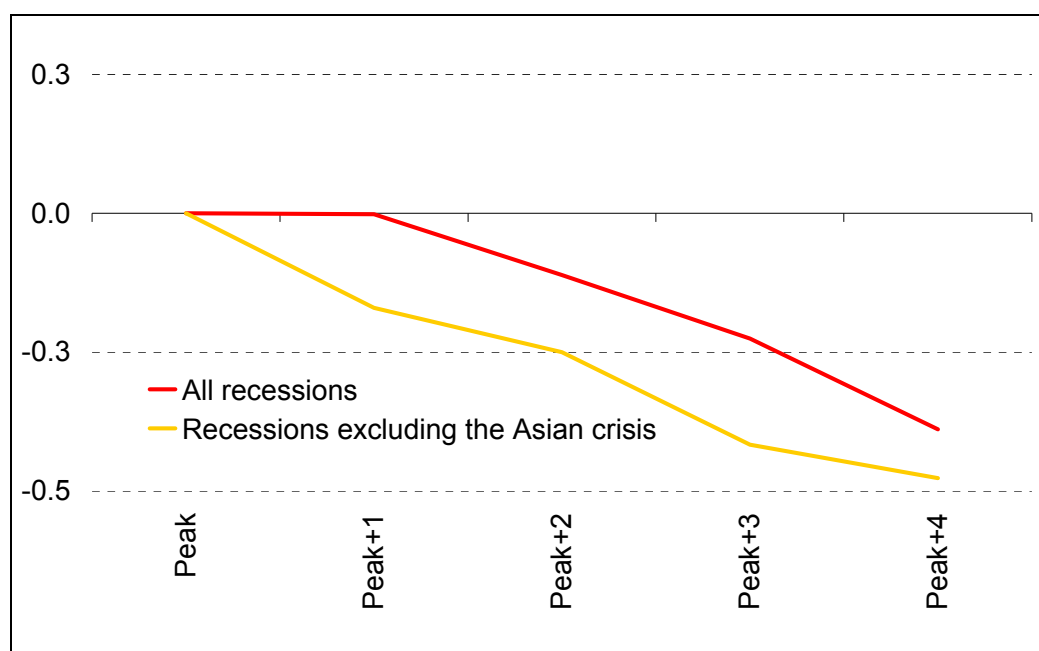
Source: IMF staff estimates.

## 5. POLICY RESPONSES AND IMPACTS

As Asia continues to grapple with the question of the right size and duration of the policy response in the current recession, it may be useful to put current policies in the context of past responses. In particular, how large and timely have these responses typically been, and to what extent did they limit the impact of recessions and speed up recoveries?

Asia *has* taken advantage of countercyclical tools in past recessions. Despite a large literature documenting the procyclicality of fiscal and monetary policies in emerging economies,<sup>13</sup> our event study analysis shows that monetary and fiscal policies in Asia tend to loosen in response to recessions. Looking at monetary policy, interest rates have typically been reduced by 50 basis points (bp) over the full year after the recession (Figure 18). Needless to say, this was simply the median response: some recessions were met with higher policy rates to defend exchange rate pegs (as during the Asian crisis), whereas others were met with very aggressive policy loosening. Declines in nominal rates were enough to outpace falling inflation, as witnessed by the fact that median real interest rates fell as well. And, as mentioned earlier, exchange rate depreciations have been a common feature of recessions in Asia.

**Figure 18: Asia: Nominal Policy Rates during Previous Recessions since 1980**  
(median, in percent, peak of the recessions =0)



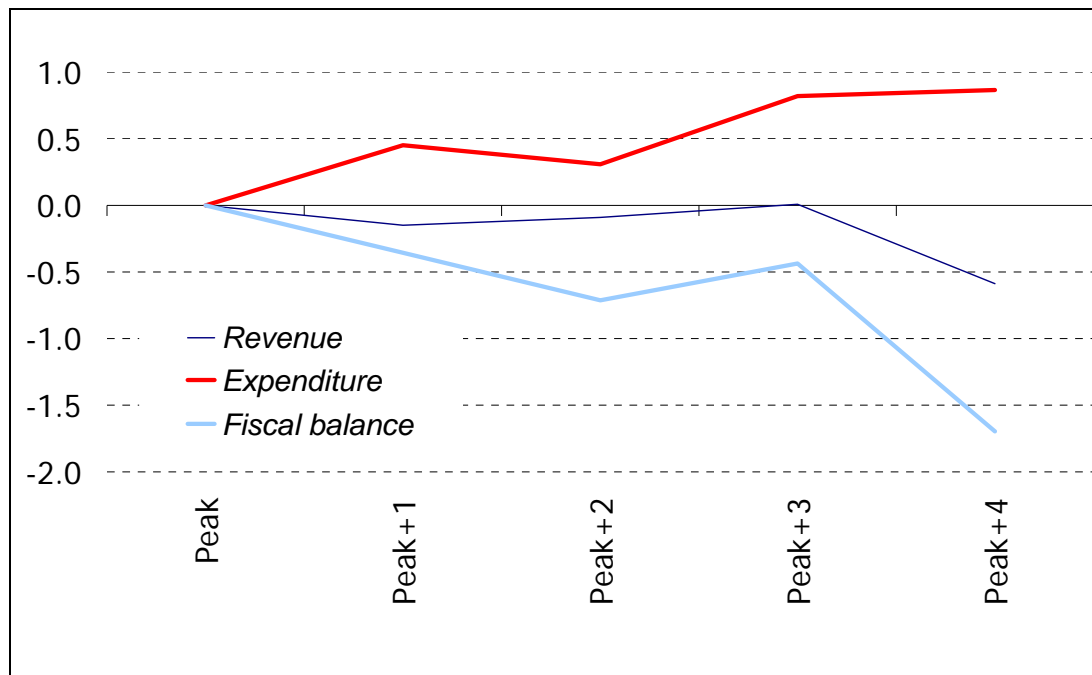
Source: IMF staff estimates.

<sup>13</sup> See Kaminsky, Reinhart, and Vegh (2004), among others.



Although monetary policy is often thought of as the first line of defense, fiscal policy has also played its part in Asia. In past recessions, fiscal balances have typically been more than 1.5% of GDP lower a year after the peak. This was in part due to falling revenues in the recession, but expenditures also tended to be raised—by 1% of GDP over one year (Figure 19).<sup>14</sup> Equally noteworthy, the response of fiscal policy has typically been quite timely, with expenditures 0.5% of GDP higher one quarter after the recession started.

**Figure 19: Asia: Fiscal Indicators during Previous Recessions since 1980**  
 (Median, in percent of GDP, peak of the recessions =0)

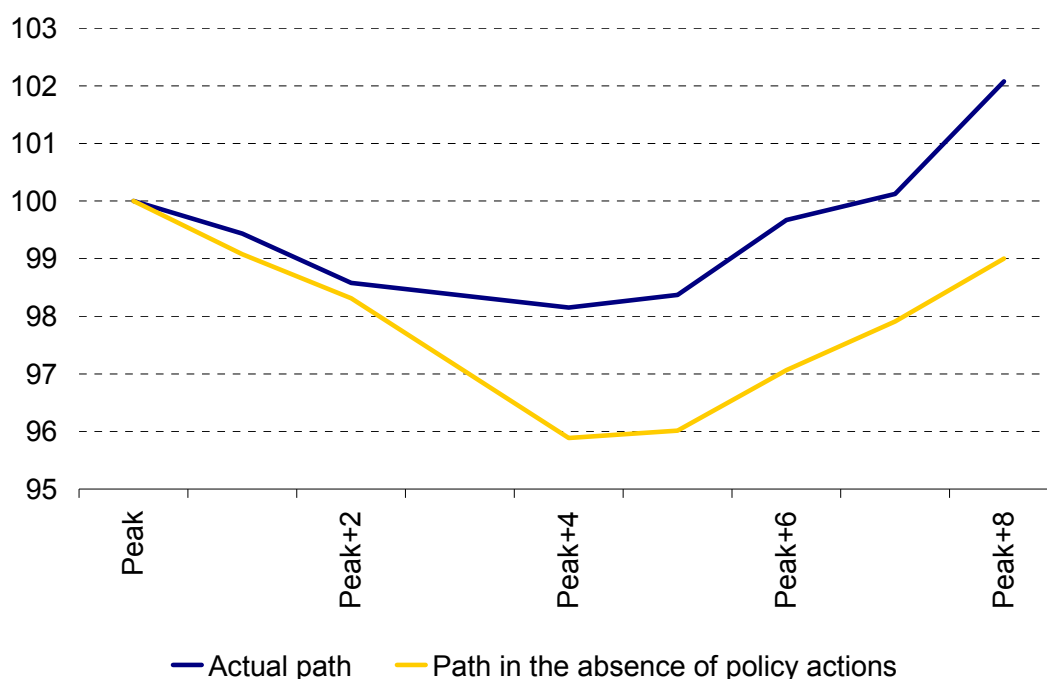


Source: IMF staff estimates.

<sup>14</sup> We do not have enough data to determine how much of this jump is due to discretionary spending and how much is due to automatic stabilizers, but the latter tend to be small in Asia.

Has countercyclical monetary and fiscal policy been effective? Reverse causality hampers a proper answer to this question, because stronger policy responses tend to be observed during deeper recessions. To circumvent this problem, we constructed a counterfactual scenario. Specifically, we borrowed from the academic literature standard values for the dynamic impact of monetary and fiscal policy on GDP, and used these multipliers together with the actual policy changes during recessions to compute how much lower GDP would have been had policy not been loosened.<sup>15</sup> The results show that, in the absence of observed policy changes, GDP would have been somewhat lower and the recovery shallower and more delayed. Because policy impacts operate with lags, the gap between the actual and counterfactual paths does not become substantial until one year after the start of the recession, but after two years the GDP counterfactual is 3 percentage points lower than actual GDP (Figure 20).

**Figure 20: Asia: Impact of Policy Actions during Previous Recessions since 1980  
(Median real GDP, peak of the recessions =100)**

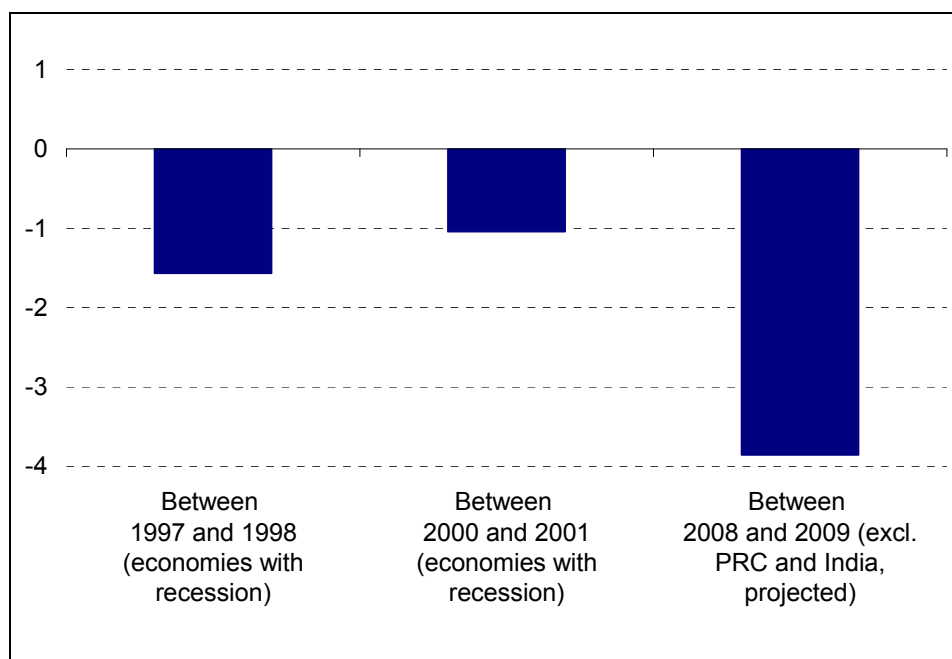


Source: IMF staff estimates.

<sup>15</sup> See Appendix 1 for details on the construction of the counterfactual scenario.

The policy response in the current recession has been substantially stronger than that during past recessions. As of May 2009, the median decline in policy rates across all countries in the region had exceeded 200 basis points (bps) since the third quarter of 2008, four times more than the median response in past recessions. Similarly, the median expected change in overall fiscal balances during 2009 is over 3.5% of GDP, more than double the response following the Asian crisis (Figure 21).<sup>16</sup> Although these numbers underscore the severity of the current recession, they also highlight the benefits of the conservative policies followed in the past decade, which expanded the available monetary and fiscal space when the crisis hit the region.

**Figure 21: Asia: Change in Fiscal Balance in Selected Recessions**  
(median, in percent of GDP)



GDP = gross domestic product; PRC = People's Republic of China.

Source: IMF (2009b).

## 6. CONCLUDING REMARKS

Just as the region's reliance on exports is a key reason it has suffered greatly in this recession, the Asian model of relying on exports to lead the recovery may not be as successful as it has been in the past, given the weak expected recovery in the G-2. In this sense, it is reassuring that countercyclical policies are being deployed to a greater extent than in past recessions. At the same time, households in advanced economies will need to repair their over-leveraged balance sheets over time, and the era of easy credit to finance purchases of consumer durables could well be over. In such an environment, the structural growth rate of Asian manufacturing and exports could be much lower. Structural reforms, such as expansion of social safety nets and deepening of domestic financial markets, will be needed if Asia wants to diversify its sources of growth more durably.

<sup>16</sup> The number for 1998 is limited to standard fiscal outlays and excludes bank recapitalization costs.

## APPENDIX

**Table A1: Asia: Identification of Previous Recessions since 1980**

	Recession episodes	Recessions identified with		
		Financial stress	Domestic banking crisis	Export demand shock
Japan	1992Q2–1992Q3 1997Q2–1999Q1 2001Q2–2001Q4	√ √	√	
Australia	1981Q4–1983Q2 1990Q2–1991Q3	√ √		
New Zealand	1982Q4–1983Q1 1985Q2–1986Q1 1989Q3–1990Q2 1991Q1–1991Q2 1997Q4–1998Q1	√  √ √		√
Hong Kong, China	1982Q1–1982Q2 1989Q1–1989Q2 1995Q2–1995Q3 1997Q4–1998Q4 2001Q1–2001Q4 2003Q1–2003Q2	√  √		√
Korea	1979Q3–1980Q2 1997Q4–1998Q2	√	√	
Singapore	1985Q2–1985Q4 1997Q4–1998Q3 2001Q1–2001Q3 2002Q3–2003Q2	√		√ √
Taipei, China	2000Q4–2001Q3 2003Q1–2003Q2			√
Indonesia	1998Q1–1998Q4	√	√	
Malaysia	1998Q1–1998Q3 2001Q1–2001Q2	√	√	√
Philippines	1983Q3–1985Q3 1990Q4–1991Q2 1992Q1–1992Q2 1998Q1–1998Q2 2000Q4–2001Q1	√ √  √	√  √	√ √
Thailand	1996Q4–1998Q3	√	√	

Sources: Laeven and Valencia (2008); Lall, Cardarelli, Elekdag and Lall (2009); and IMF staff estimates.

## A1. Data Coverage

The sample of Asia and Pacific region economies includes Japan; Australia; New Zealand; PRC; India; Hong Kong, China; Korea; Taipei, China; Indonesia; Malaysia; Philippines; and Thailand, although no recessions were identified in the PRC or India.

The sample of advanced economies includes Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, and US.

The sample of non-Asian emerging economies includes Argentina, Brazil, Chile, Colombia, Costa Rica, Croatia, Ecuador, Islamic Republic of Iran, Latvia, Lithuania, Mexico, Peru, Poland, Russia, South Africa, Serbia, Slovak Republic, Turkey, Uruguay, and Venezuela (other economies were part of the sample but no recession was identified for them).

The data are quarterly, and we focused on the post-1980 period because of the dramatic changes in the structure of Asian economies over the past four decades.

## A2. The Bry-Boschan Algorithm

Recessions were identified using the Bry-Boschan (1971) algorithm. Formally, the algorithm follows:

$y_t$  is defined as local peak if  $y_t - y_{t-1} > 0$ ,  $y_t - y_{t+2} > 0$ ,

$y_{t+1} - y_t < 0$ , and  $y_{t+2} - y_t < 0$ ;

$y_t$  is defined as local trough if  $y_t - y_{t-1} < 0$ ,  $y_t - y_{t+2} < 0$ ,

$y_{t+1} - y_t > 0$  and  $y_{t+2} - y_t > 0$ ,

where  $t$  denotes a given quarter.

A recession is defined as the time (i.e., number of quarters) between the local peak and local trough. The cumulative output loss in the recession is the cumulative difference across all recession quarters between actual GDP and the level of GDP at the local peak.

A recovery is defined as the time between the local trough and the first quarter in which GDP equals or exceeds GDP at the previous peak. An expansion defines the time between a local trough and the next local peak.

Finally, note that official business cycle dates are available for a few countries only. Even when available, the study used the Bry-Boschan algorithm to date the cycles in order to preserve a common methodology across countries.

## A3. Financial Stress Recessions

A recession is defined as a financial stress recession if:

- an advanced economies Financial Conditions Index (FCI) is at least one standard deviation above its mean (indicating greater-than-average stress) in any of the four quarters before of the recession, and/or
- the country was experiencing a systemic banking crisis during the recession, as defined by Laeven and Valencia (2008).

The advanced economies FCI is drawn from Cardarelli, Elekdag, and Lall (2009), and is an equal-variance weighted average of seven variables: stock market declines, time-varying stock price and real exchange rate volatility, corporate spread, TED spread, inverted term spread, and the banking sector  $\beta$  (i.e., covariance between financial stocks and the overall market). See Cardarelli, Elekdag, and Lall (2009) for more details.

Ideally, financial stress recessions in this paper would have been identified with an Asia FCI analogous to the advanced economies FCI, rather than relying on a composite of two different, not directly comparable variables. Unfortunately, data limitations meant that an Asia FCI could only be computed for the post-1996 period, making it unsuitable for this paper.

#### **A4. Vector Autoregressions (VARs)**

The VARs were run in panel form, and include four variables: the year-on-year (y/y) growth of private domestic demand in the US, and the y/y growth of private consumption, investment, and exports in country  $i$ , where  $i$  belongs to the panel of countries. We allowed for country-specific fixed effects but otherwise imposed common coefficients across countries in the panel. Eight lags were imposed, and the impulse responses presented in the text of this paper are the generalized impulses normalized so that the export growth shock equals 15 percentage points on impact. We ran the VARs for two panels of Asian economies: (1) Hong Kong, China; Korea; Singapore; Taipei, China; Malaysia; and Thailand (high export exposure group); and (2) Japan, Australia, New Zealand, India, and Philippines (low export exposure group). Indonesia was excluded from the second group because the panel VAR did not display well-defined impulse responses when including Indonesia.

#### **A5. Constructing the Counterfactual**

We constructed an artificial counterfactual GDP by subtracting from actual output the impact of monetary and fiscal policy changes observed during recessions (we looked at the policy actions that took place over four quarters starting at peak). The assumed impact on GDP per 100 bps reduction in the policy rate was derived from the IMF's Global Economic Model and amounts to 0.48 percentage points for Japan, 0.44 for Australia and New Zealand, 0.60 for Korea and Taipei, China; and 1.40 for ASEAN-4 countries; Hong Kong, China; and Singapore. The impact of monetary policy was assumed to be staggered across four quarters. The impact of fiscal policy on quarterly GDP was assumed to be 0.7 for each percentage point change in the expenditure to GDP ratio. Because these multipliers derive from calibrated models (as opposed to being estimated) they are not subject to the reverse causality problems.

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