



2012 SPILLOVER REPORT

July 9, 2012

EXECUTIVE SUMMARY

- A world of highly correlated asset prices, ubiquitous financial shocks, and limited policy space is a world ripe for spillovers. In this setting, the actions and inactions of systemic economies have far greater effects on the world than in normal times.
- Together with the worsening outlook, this explains the concerns voiced by officials in this year's spillover exercise. In rough order of intensity, these related to:
 - The difficulty in getting—and staying—ahead of the crisis in the Euro Area.
 - The uncertainties surrounding US fiscal policy, and the side effects of US/ advanced country monetary policy.
 - Fears of a reversal in growth and external demand from China, and of a jump in government bond yields in Japan.
 - The unintended consequences of some financial reforms.
- A range of empirical methods is used to explore these issues. It is found that many of the above would have profoundly adverse effects on economic partners, which are quantified through numerous empirical studies and model simulations.
- Overall, the analysis of spillovers provides an external rationale for the policy advice in the Article IV consultations with the five systemic economies. It also adds to the case for global cooperation in preventing the stresses that cause spillovers, and for attenuating the effects when they do occur.

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Spillover reports examine the external effects of domestic policies in five systemic economies (S5), comprising China, the Euro Area, Japan, the United Kingdom, and the United States. The report aims to provide an added perspective to the policy line developed in the Article IV discussions with these entities and an input into the Fund's broader multilateral surveillance.

Topics for this report were chosen based on consultations with officials from the S5 and selected emerging markets (Brazil, the Czech Republic, India, Korea, Mexico, Poland, Russia, Saudi Arabia, Singapore, South Africa, and Turkey). Each participant was asked about policy concerns and spillovers from the S5. To facilitate candor, the report does not attribute views regarding partner countries.

Rather than try to capture the full range of spillovers, this report builds on last year's findings, focusing on the forward-looking issues raised by partners and on S5 officials' reactions.

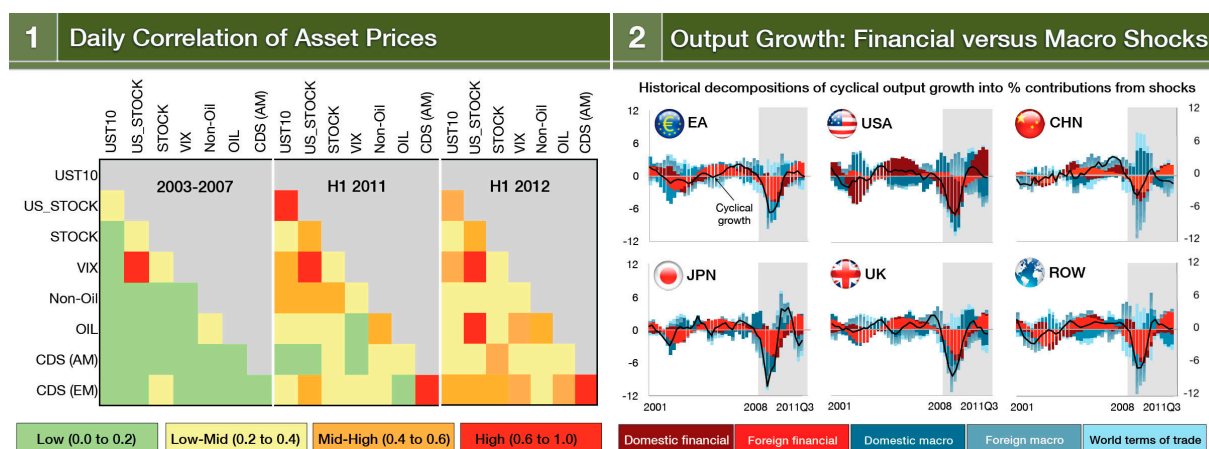
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I. BACKGROUND

High asset price correlations, shocks to financial risk premia, and limited policy space all combine to intensify cross-border spillovers from systemic country policies and developments. Together with the deteriorating outlook, this explains the heightened concern expressed this year about spillovers.

1. **The message in correlated asset prices.** Asset prices reflect risk aversion, expected economic conditions and policies, and uncertainty about future economic conditions and policies. The jump up in their variance and co-movement—across asset classes and countries, even at a *daily* frequency (Fig. 1)—suggests heightened uncertainty about the financial and macroeconomic variables that shape global prospects and attitudes to risk. Viewed this way, what are conventionally termed “shocks to financial risk premia” speak to the broader uncertainty over the path of world economy. Since 2008, such shocks seem to have become the main contributor to cyclical fluctuations in advanced economies (Fig. 2), although there are technical issues here (e.g. anticipated macro shocks may affect risk premia and get classified as financial shocks).

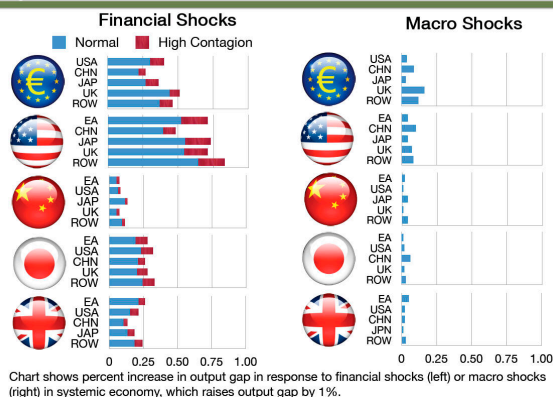


See background paper 1: *Correlation of Financial Market Asset Prices*.

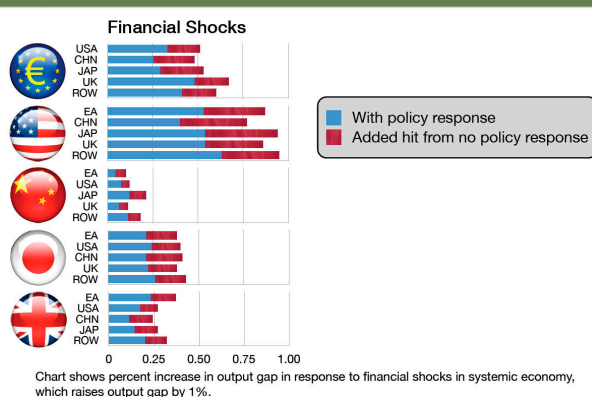
See background paper 2: *Business Cycle Accounting for the Systemic Five*.

2. **The global business cycle.** Co-movement in asset prices also suggests stronger co-movement in business cycles. Simulations using the staff’s G-35 model show that the cross-border impacts are much larger for risk premia shocks than for macroeconomic ones (Fig. 3). These spillovers are intensified when limited policy space reduces the scope for counter-cyclical policy (Fig. 4). The model simulates the latter by switching off the estimated monetary policy response (up to the zero interest rate bound) and offsetting the operation of automatic fiscal stabilizers.

3 Output Spillover Coefficients



4 Output Spillover Coefficients and Policy Space



See background paper 3: *Spillovers from Macroeconomic versus Financial Shocks in the S5*.

3. **Policy concerns.** Between the larger downside risks in systemic economies, and the above mentioned tendency of stresses to diffuse rapidly through asset prices, the greater disquiet voiced by officials consulted this year regarding spillovers is not surprising:

- *Euro area stresses.* This was by far the most urgently expressed concern. Despite progress in the face of constraints, the sense is that not enough has been done to stop the spread of stresses and attenuate fiscal-growth-banking feedback loops.
- *US fiscal policy.* The worry here is of too sharp fiscal contraction in 2013 and, not enough—or ill defined—adjustment in the medium term, both with potential to disrupt economic activity and financial markets.
- *US/advanced economy monetary policy.* Officials from emerging market economies thought the easing of monetary policy in advanced economies had the side effect of pushing up the prices of emerging market currencies, assets, and commodities.
- *China growth and rebalancing.* There was acknowledgment of progress in adjusting the exchange rate and reducing the current account surplus. However, with the adjustment investment-led in an economy with already high investment rates, an abrupt reversion could yield negative spillovers.
- *Japan fiscal risks.* High public debt, the highest in the S5, makes it vulnerable to an abrupt shift in market sentiment.
- *Financial reform.* There is widespread support for it, but some elements are problematic—e.g., the prohibition of proprietary trading in *other* countries' sovereign debt under the Volcker rule, thus raising liquidity premia and bond yields.

4. **Approach.** The shocks analyzed in this report were selected in response to the above concerns, not because they seemed more probable than other risks facing the global economy—for more on that, see the last *World Economic Outlook*, *Global Financial Stability Report*, and *Fiscal*

Monitor. While some of the risks are more immediate, it is important that Fund surveillance explore all evenhandedly. In trying to do so, this report does not confine itself to a single analytical approach but presents work based on a range of empirical models, which have different strengths and weaknesses. Thus, for example, where financial channels and granularity in country coverage are important, the staff's G-35 model is given more play (e.g., US, Euro Area); where real and trade channels dominate and regional effects vary (e.g., China, Japan), various types of vector autoregressions and the staff's GIMF model are employed; and where banking channels are the issue (e.g., UK, Euro Area deleveraging), the analysis uses BIS and market data. Given the uncertainty about underlying relationships since the crisis, an eclectic approach seems advisable.

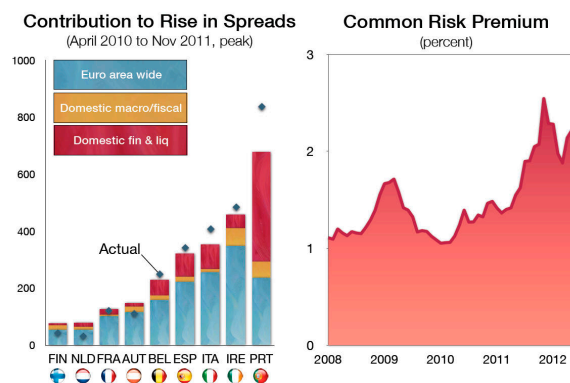
II. EURO AREA

Despite efforts to the contrary, euro area stresses are no longer a periphery-country issue but pan-European in nature. Spillovers from a failure of policies to get ahead of the crisis would thus be widespread. Policy reactions by the whole euro area and its partners can mitigate these effects.

5. **The spread of the crisis.** The take away in last year's euro area spillover report was that, provided that the crisis does not spread from the periphery countries to the core, stresses in the monetary union would have relatively modest effects on the rest of the world. As it happens, these stresses *have* spread—to the point that the observed increase in sovereign risk premia of many euro zone countries is predominantly driven by a common factor rather than by country-specific macro/liquidity risks (Fig. 5). The rise in the common factor may well reflect global influences (e.g., oil prices, world growth prospects). But it surely also reflects the fact that trade and financial links closely bind European countries, including to large ones under stress such as Spain and Italy. Risk spreads are also affected by market assessments of broader policy action—and inaction. In particular, there is the sense that, despite progress (e.g., ECB action, firewalls), pan-European responses to what is now a pan-European problem have fallen short. As described in the staff report for the 2012 Euro Area Article IV consultation, concerns about the viability of the common currency area are being fuelled by weak growth prospects in the wake of bank deleveraging and fiscal consolidation, adverse feedback loops between bank and sovereign stress, and the limited progress on reforms to raise trend growth across—and adjust competitiveness within—the euro area.

6. **Simulation assumptions.** An intensification of the sovereign debt crisis can be modeled as a jump in sovereign and private yields, which rise by varying degrees according to whether a euro area country is high yield (300 bps for Greece, Ireland, Portugal, Spain, and Italy), mid-yield (150 bps

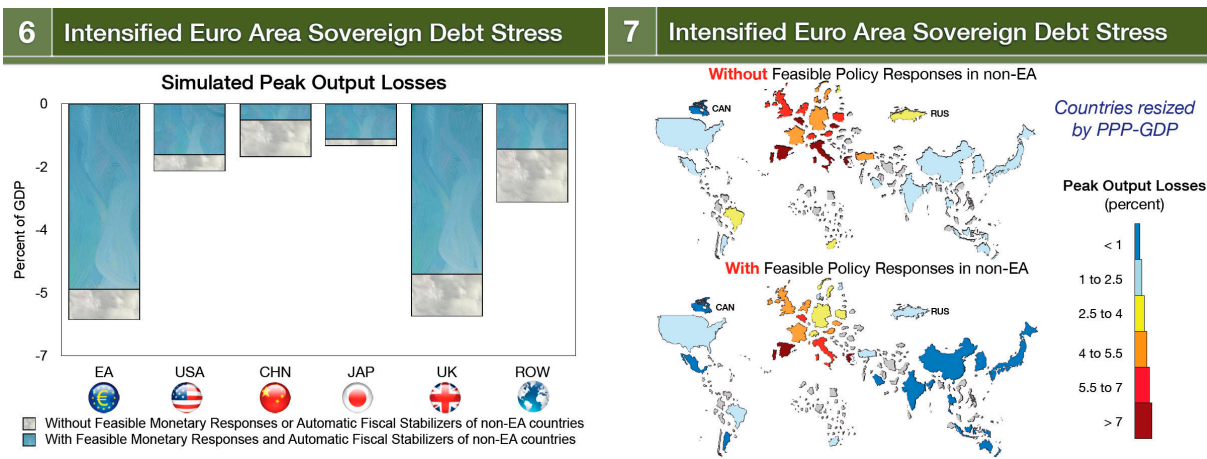
5 Common Factors in Euro Area Sovereign Risk



See background paper 4: *Commonalities, Mispricing, and Spillovers: Euro Area Sovereign Risk.*

for Austria, Belgium, and France) or low yield (50 bps for Finland, Germany, and Netherlands). Building in proportionately pro-cyclical fiscal policy responses (forced by lack of market confidence), lower private demand (reflecting wider confidence effects) and—perhaps most importantly—factoring asset price correlations based on event studies from late-2011, the spillovers and interactions from these developments can be traced out using the staff’s G-35 model.

7. **Simulation results.** Under this scenario, medium-high to severe output losses across the euro area result in nearly equivalent losses in the UK and Eastern Europe, and more moderate but still significant losses elsewhere (Figs. 6–7). Peak output losses in the model occur about two years out—so that of the 5 percent hit to the euro area shown below, about 3½ percent is in the first year and the balance in the second (which, coincidentally, is close to the path derived using a different approach in the April 2012 *World Economic Outlook*). Conventional policy responses in partner countries—lowering interest rates up to the zero bound and letting automatic fiscal stabilizers work—can mitigate these losses in the rest of the world and, by buffering foreign demand, in the euro area itself. More realistically, nonconventional policy responses such as quantitative easing and discretionary fiscal stimulus would almost certainly be deployed in many countries. Assuming these succeed in raising asset prices and global demand, the spillovers would be much less severe.



See background paper 5: *Effects of an Intensification of the Euro Area Sovereign Debt Crisis.*

8. **More details.** The above spillovers are transmitted via trade, financial, and commodity price linkages. In most countries outside the euro area, output contracts as financial conditions tighten in response to various degrees of higher government bond yields and lower equity prices, and as euro area imports fall (intensified by euro depreciation). For selected safe haven countries such as Japan and the United States (identified by event studies from the fall of 2011), financial conditions tighten less than broader monetary conditions, because the effects of small reductions in government bond yields partly offset moderate declines in equity prices; their currencies also appreciate in real effective terms, exacerbating the contraction in external demand they face. In the simulation, the countries in Central, Eastern, and South Eastern Europe (CESEE) bear much of the brunt of euro area

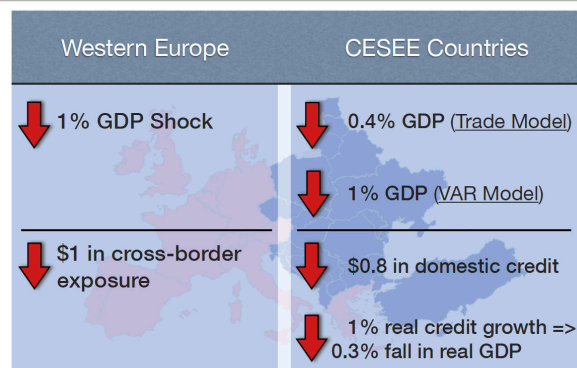
stress, reflecting extensive trade and banking linkages—the latter have played a major role in credit boom-bust cycles in several CESEE countries (Fig. 8). Box 1 describes the impact on low-income countries, where the hit to economic growth, which has been robust through the crisis, is likely to be accompanied by higher fiscal and balance of payments financing gaps, as euro area demand and commodity prices fall.

9. **Has the shock already hit?** Partly yes, but mostly no. Given the rise in periphery country spreads (up 150 basis points since the post-ECB/LTRO trough in March), half of the above scenario's 300 basis point originating shock to the periphery already seems to have materialized. The other half of the shock would obviously strain those countries, and possibly cut off market access (in the latter case, the secondary market price is still meaningful and would affect other asset prices, though the scenario would need to be modified to account for the wedge between flow financing costs and secondary market yields). But more significant than the size of the periphery shock is the fact that the contagion has so far been less than in late 2011, the events to which the scenario is calibrated. What stands between the current situation and the playing out of the scenario is the residual public confidence that policymakers will ultimately act to avert the spread of the crisis.

10. **Deleveraging.** Since the intensification of the crisis in the latter half of 2011, deleveraging by euro area banks has been a cause for widespread concern. So far, the deleveraging has been more inside Europe than outside (Fig. 9), and the hand off of assets to outside buyers has not been at distressed prices. In many Asian countries for example, the retreat of French banks in the latter half of 2011 was matched by the advance of Japanese and other regional banks. But this could change. The process could involve several channels, especially from European Global Systemically Important Banks (GSIBs), generating financial spillovers via direct links, asset sales, common exposures, and their role as market makers in derivative markets.

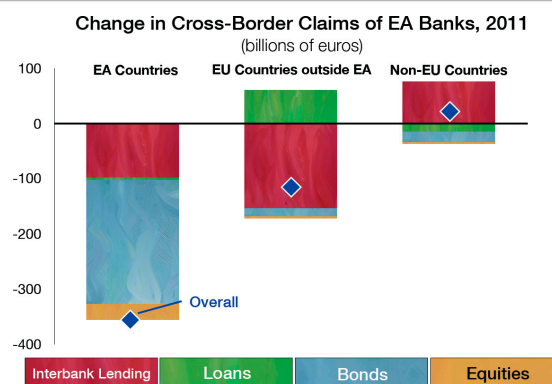
- First, indices of contagion are created using market price correlations and balance sheet data. This work suggests that many EU banks have above average spillover potential, as generators (six French, German, and UK banks) and recipients (seven French, UK, Italian, and Spanish banks). The analysis uses publically available data but names are withheld here due to its sensitivity.

8 Central, Eastern, and Southeastern Europe



See background paper 6: *Spillovers between Western Europe and the CESEE*.

9 Deleveraging Faster Inside Euro Area



Box 1. The Impact of the Euro Area Crisis on Low-Income Countries

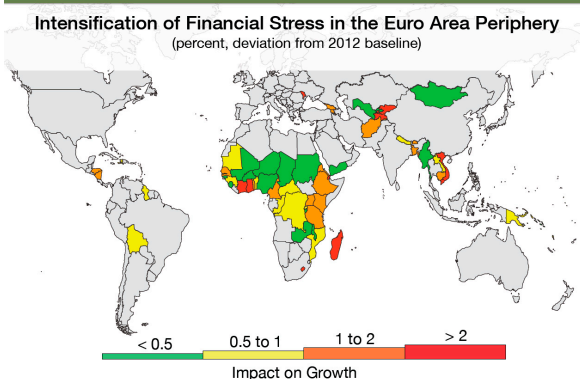
Low-income countries (LICs) have experienced a strong economic recovery since early 2010 but remain vulnerable to a deterioration in global conditions. While strong growth of around 5 percent is projected for 2012-13, an intensification of financial stress in the Euro area would hit growth, exports, remittances, and foreign direct investment.

In 2009, solid pre-crisis macroeconomic positions facilitated a countercyclical policy response to the crisis—a first for LICs. But despite recovering quickly, progress in rebuilding macroeconomic buffers after the crisis has been slow, with many LICs having limited fiscal space, larger current account deficits, and a resulting slow build-up in reserve coverage. With aid envelopes in many traditional donor countries constrained, the scope for countercyclical fiscal policy in LICs would be more limited in the event of further external shocks.

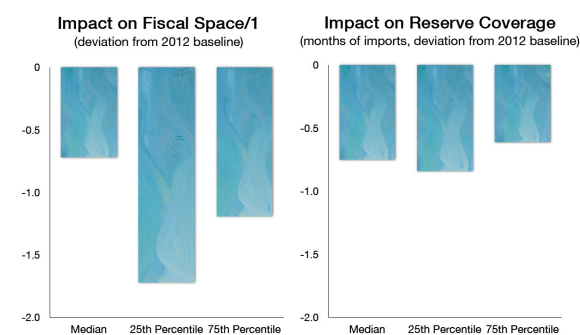
Using a framework developed for the Vulnerability Exercise for Low-Income Countries, the scenario under consideration in which an intensification of the euro area crisis results in global output losses and lower commodity prices is entered. The hit to LIC output ranges from mild to severe. LICs' added external financing needs of US\$27 billion could emerge by the end of 2013. About half of LICs would face higher financing needs, with a significant share of total needs concentrated among a few large LICs in Sub-Saharan Africa and Asia. In the absence of adjustment or new financing, the proportion of LICs with reserve coverage below 3 months would increase from 26 to 62 percent, and about 40 percent of LICs would have insufficient fiscal space to fully accommodate the shock. External and fiscal policy buffers are higher for commodity exporting LICs, providing these countries with better opportunities for countercyclical policies. Fiscal space is particularly limited in "small economy" LICs (those with populations under 1.5 million).

The downside risks to the global economy underscore the urgency for many LICs to restore their macroeconomic policy buffers so long as their recovery continues. To build resilience against shocks over the medium term, LICs should aim to increase the efficiency of public investment, while pursuing structural reforms to deepen financial systems, develop social protection systems, and diversify their economies.

10 LIC Output Losses



11 LIC Spillover

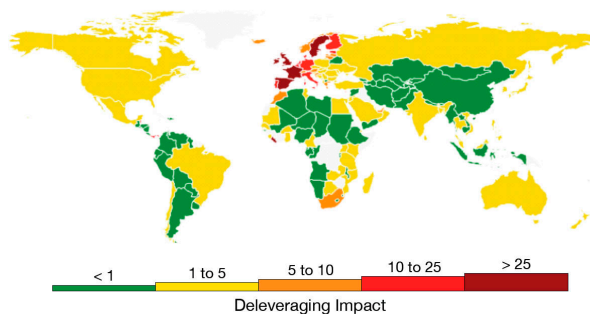


¹ Difference between baseline primary balance and constant primary balance needed to reach debt to GDP ratio of 40% within 20 years.

- Second, data on systemically important banks from the European Banking Authority's recapitalization exercise can be used to calibrate shocks to European banks that set off cross-border deleveraging; (as discussed in the background paper, the size of the shock and factors behind deleveraging differ from the scenario in the last *GFSR*). The contraction in banking assets is most severe in the UK, followed by neighbors and, some advanced and emerging market economies (Figs. 12–13). In general, funding shocks have more severe effects than losses from sovereign shocks.

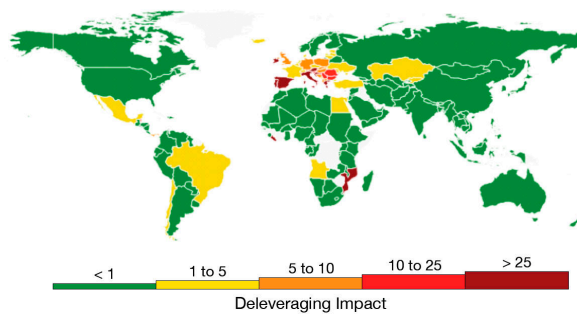
12 Spillovers from European GSIBs

Deleveraging due to Funding Shocks
(percent of GDP)



13 Spillovers from European GSIBs

Deleveraging due to Sovereign Shocks
(percent of GDP)



See background paper 7: *Financial Spillovers from Euro Area/UK Global Systemically Important Banks*.

III. UNITED STATES

US recovery and stabilization have been a plus for the world, but there are risks from the uncertain path of fiscal adjustment—too sharp tightening in the near term and too undefined in the medium term. The role of Fed policy in pushing up emerging market currencies/asset prices is hard to isolate.

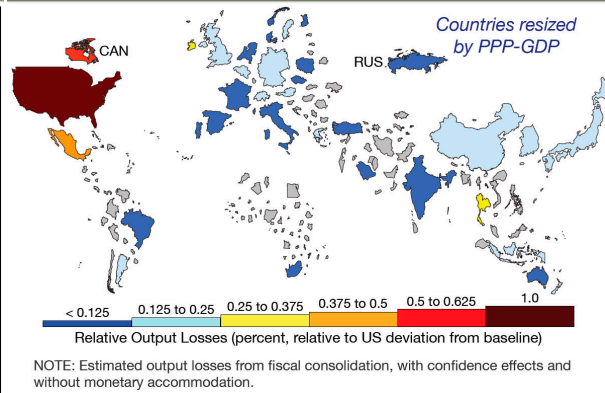
11. **Fiscal concerns.** With the recovery tentative and US public debt on an upward trend even before the crisis, the Fund has for some time urged: (1) calibration of near-term adjustment to the pace of the recovery; and (2) the spelling out of future objectives and actions, with requisite political backing to credibly underpin medium-term adjustment. But political gridlock may yield a different outcome: a sharp and mandatory reduction in the deficit starts in January 2013 as tax provisions expire and automatic spending cuts take effect (the “fiscal cliff” in the path of a still tentative recovery), while under-delivering on measures to stabilize the medium-term debt ratio. Simply put, fiscal adjustment may go too far in the near term and not far enough in the medium term. The likelihood of these shocks—or a variant such as a government shutdown and/or technical default due to political impasse over the debt ceiling—may be low, and one might even attenuate the other, but they are worth exploring because their impact on the world economy is potentially very large, not least on account of their transmission via financial markets.

12. **Spillovers from the fiscal cliff.** The fiscal contraction built into the fiscal cliff is 4 percent of GDP (3 percent of GDP more than in the WEO baseline). A range of models is used to consider the short-term impact of the fiscal cliff, from simple calculations with tax and expenditure multipliers to fuller scenarios using various modeling approaches, each of which has its own assumptions regarding the permanence of the cliff and associated confidence effects (Fig. 14). The largest—not necessarily the most likely—hit to US growth comes from the G-35 model because it treats the cliff as temporary (i.e., private consumption does not rise to offset lower public demand), and since it builds in negative confidence effects (i.e., a 15 percent drop in stock prices, partially offset by lower long bond yields on account of the lower debt path). The spillovers from this model are also larger, and operate mainly via trade channels, which is why neighbors are most affected (Fig. 15). But China and several advanced countries would also suffer up to one quarter of the hit taken by US growth. Lower commodity prices—6–12 percent for energy and 3–6 percent for non-energy, depending on confidence effects and policy responses—also adversely affects net exporters of these goods. Were the assumed confidence effects more negative, so would be the spillovers.

14 US Fiscal Cliff - Estimated US Output Losses in 2013

	Fiscal Multipliers	GIMF Model	GPM Model	G35 Model
Output Losses	Percent deviation from baseline			
Without Monetary Accommodation	...	-2.7	-2.0	-4.8
(Implied Fiscal Multiplier)	...	0.9	0.6	1.6
With Monetary Accommodation	-1.8	-1.2	...	-4.0
(Implied Fiscal Multiplier)	0.6	0.4	...	1.3
Technical Assumptions				
Persistence of Fiscal Consolidation	N/A	Permanent	N/A	Temp but persistent
Financial Market Confidence Effects				
Bond Market	None	-50 bps LT Yield	None	-15 bps LT Yield
Stock Market	None	None	None	-15 % equity price

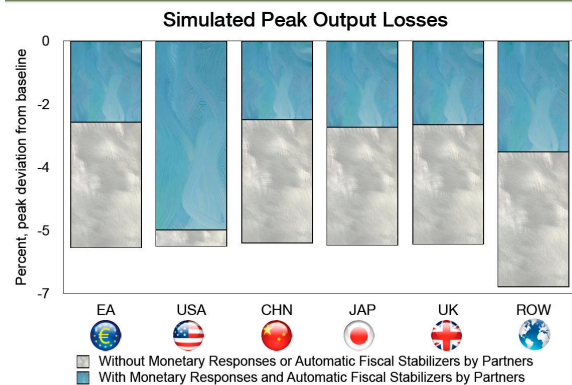
15 US Fiscal Cliff - Simulated Output Losses (2013)



See background paper 8: *Global Implications of the US Fiscal Cliff*.

13. **Long-term fiscal sustainability.** Over the medium term, the larger concern to S5 counterparts is US fiscal sustainability. The effect of erosion in public confidence in the medium term can be modeled by assuming a 200 basis point jump in US long-term yields, using asset price correlations from event studies to simulate the knock on to global financial markets, and then tracing the effects on the United States and its partners. Because a loss in confidence is more germane to the medium term, by which time policy rates would have recovered from their current near zero settings, it is assumed that United States and its partners have scope for conventional monetary policy reaction and for allowing fiscal stabilizers to work. But even on

16 US Sovereign Stress - Simulated Output Losses



See background paper 9: *The Effects of a Sovereign Debt Crisis in the United States*.

this basis, the hit to the United States and the rest of the world is substantial, with very strong financial spillovers (Fig. 16). As might be expected of the world's largest economy, financial center, and reserve asset issuer, the peak output losses shown are larger than for the equivalent shock to the Euro Area. However, there is a lingering question: to what assets would holders of US bonds, the ultimate safe haven, flee? The prospect of a severe loss would undoubtedly concentrate minds and force an answer—in this state of the world, more likely a move to commodities and cash than to equities and other sovereign debt. But the model does not really capture these or other channels, and so does not do full justice to the thought experiment of substantially higher US default risk.

14. **Monetary policy.** Several emerging market economy officials complained that easy monetary policy in the US and other advanced economies was pushing volatile capital to emerging markets (especially to those with more open capital accounts) and raising commodity prices (especially those held as assets, like oil). In

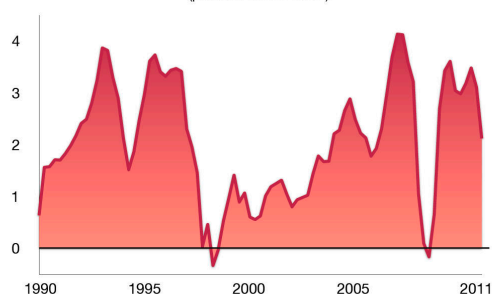
setting out these concerns, they recognized the positive effect of easy monetary policy in preventing a sharper deterioration in global output and financial conditions. Their difficulty was with the added policy complications for themselves. At one level, the stated effects should not be surprising: monetary policy *does and is supposed to* work through exchange rates and asset prices. And net capital flows to emerging markets are indeed almost back to their peak levels before the crisis (Fig. 17). But

the sharp drop at the end of the chart says something about a world where market sentiment oscillates between risk-on and risk-off, and where monetary policy *responds* to the same stresses moving currencies and asset prices. In such a world, the contribution and causality from monetary policy is hard to pin down, as evidenced by the three analytical approaches attempted this year.

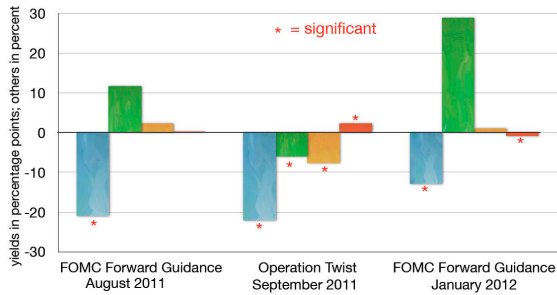
- **Event studies.** These rely on market efficiency to identify the effect of monetary policy on asset prices at the time that the public first learns of a new policy. In last year's US spillover report, event studies found that QE1 had far larger effects on emerging market currencies and asset prices than QE2 (e.g., a 100 basis point lower US long bond yield was associated with a 150 basis point decline in emerging market yields in QE1 but less than 50 basis points in QE2). Three policy announcements in 2011–12, forward guidance and the so-called Operation Twist, allow an extension of this analysis. In all cases, US long-term yields fell as desired but the effects on asset prices and currencies were mixed (Figs. 18–19). The latter likely reflects complications from the endogeneity of monetary policy (which was reacting to the pull on asset prices in the opposite direction), market anticipation of policy, and parallel developments on event days (i.e., bank downgrades).

17 Volatile Capital Flows

Net Capital Inflows to Emerging Markets
(percent of EM GDP)



18 US Monetary Easing



19 US Monetary Easing - Announcement Effects

FOMC Forward Guidance August 2011, Operation Twist September 2011, FOMC Forward Guidance January 2012

	FOMC Forward Guidance August 2011			Operation Twist September 2011			FOMC Forward Guidance January 2012		
	10Y Govt Bond Yield	Stock Market	Exchange Rates	10Y Govt Bond Yield	Stock Market	Exchange Rates	10Y Govt Bond Yield	Stock Market	Exchange Rates
GER	-0.05	-2.02	0.01	-0.03	-4.37	1.76	-0.09	1.4	-0.56
FRA	-0.18	-2.72	0.01	-0.06	-4.28	1.76	-0.12	0.19	-0.56
ITA	-0.13	-2.83	0.01	-0.13	-3.22	1.76	-0.33	0.67	-0.56
USA	-0.21	0.12	n.a.	-0.22	-6.03	n.a.	-0.13	0.29	n.a.
CHN	-0.17	2.19	-0.28	-0.01	-3.18	0.06	n.a.	n.a.	-0.05
JAP	-0.01	0.06	-1.17	-0.01	-3.74	-0.27	-0.04	-0.82	-0.28
UK	-0.17	-0.04	1.14	-0.05	-4.19	2.57	-0.09	0.18	-0.41
BRA	-0.08	5.6	-0.08	0.29	-5.50	6.72	-0.07	0.75	-0.53
MEX	-0.17	1.59	1.85	0.21	-5.70	6.53	-0.14	1.05	-0.83
KOR	-0.16	0.89	-0.28	-0.10	-8.46	2.69	-0.02	0.65	-0.55
TUR	-0.08	-1.78	-0.28	0.31	-7.41	3.10	-0.12	4.44	-1.46
ZAF	n.a.	n.a.	0.85	0.29	-3.99	9.48	-0.2	0.77	-1.82

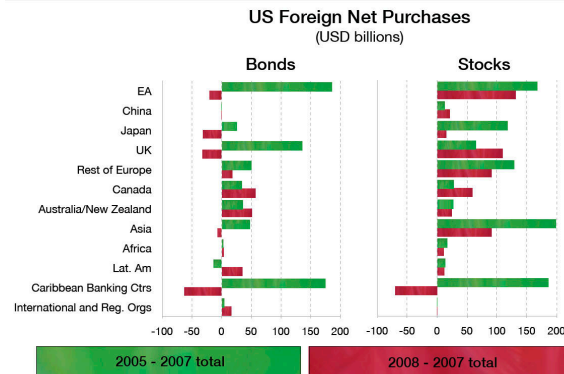


See background paper 10: *Recent US Monetary Policy Actions—domestic & international effects.*

- **US portfolio flows.** A second line of inquiry begins by positing that, if easy monetary conditions were indeed pushing capital out to emerging markets, this should at least be visible in US external portfolio flows.

While fully available only through 2010, the data suffice to capture the surge in reserve money after QE1 and QE2. As a general matter, there is no sign of a “wall of US money” heading out of the country, with net purchases of stocks and bonds generally lower than before the crisis (Fig. 20). However, *geographical* allocations have changed, with higher purchases of bonds from Australia, Canada, and Latin America, and a cutback from Europe. This development would seem to have as much to do with relative pull factors (better growth and prospects in emerging markets relative to Europe) as with relative push factors (a more negative interest rate differential vis-a-vis emerging markets).

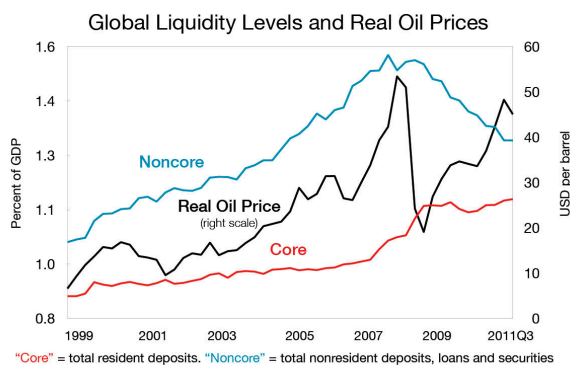
20 US Portfolio Flows



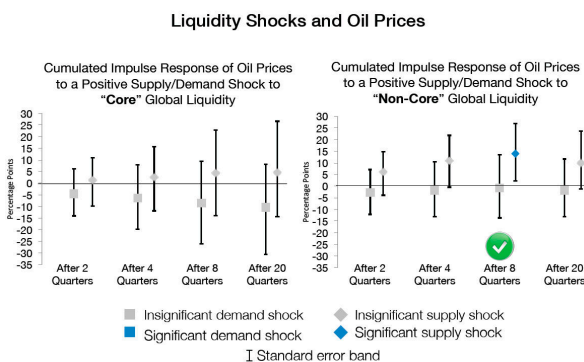
See background paper 11: *US Portfolio Flows since the Crisis.*

- **Vector autoregressions.** Finally, one can look for longer-term evidence on the effects of global liquidity on commodity prices. However, using alternative measures of “liquidity”—a core concept akin to M3 and a non-core measure that captures the use of bank securities to fund asset positions—there is little evidence that liquidity supply shocks affect commodity prices in general, and oil prices in particular (Figs. 21–22). Overall, after controlling for other factors, liquidity shocks explain less than 10 percent of the variation in oil prices for the period as a whole and since the crisis.

21 Global Liquidity



22 Global Liquidity



15. **To sum up.** The above results do not permit any easy generalization about advanced country monetary policy as the main driver of asset price pressures in emerging markets. There has undoubtedly been push from the former but also pull from the latter. The counterfactual of tighter policies in advanced economies may also imply more turbulent conditions in global financial markets and lower demand from advanced economies, which is not the outcome sought. Context seems important. Few countries complain about the Fed's QE1 action in 2008–09 or about the ECB's LTRO operations in 2011–12 because these occurred at times of near collapse, when the global benefits of the action were unquestionable. This may be less true of more recent US monetary easing, when the macro-financial context was much less dire. In the Article IV reports of the advanced S5, the staff has advised further monetary easing where the balance of risks is to the downside, as in the euro area, or if downside risks become imminent.

16. **Financial reform.** Although the push toward stronger regulation of the financial sector is welcomed, specific aspects of it drew criticism from US counterparts. The problem is that the proposed segregation of regular banking from riskier trading does so in a way that discriminates against non-US sovereigns (US public securities are exempt). As discussed in Box 2, this is possible but lack of clarity on how the rule will be implemented and lack of data make it hard to assess.

IV. CHINA

Investment has been a key driver of growth and lower external surpluses. But slower investment, while desirable to rebalance demand to consumption in the medium term, could in the interim hit partners and world prices, especially if the adjustment were to be sharp and disorderly.

17. **The role of investment.** Investment has been a major driver of growth in China since the onset of the crisis and of the reduction of its current account surplus—a long standing issue for global policy. In this way, China has helped to make up some of the shortage in demand from advanced economies since 2008, especially benefitting producers of capital goods and commodities.

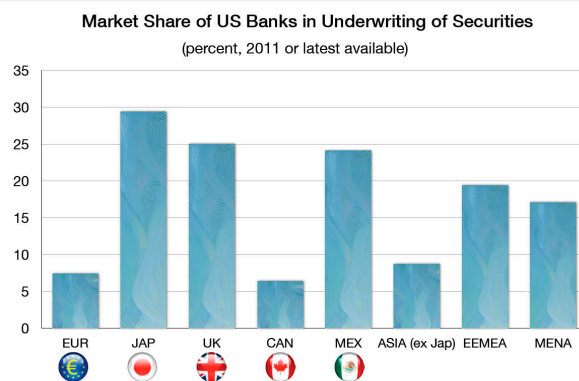
Box 2. The Volcker Rule

The Volcker rule of the *Dodd-Frank Act* aims to reduce systemic risk in the US financial system by prohibiting deposit-funded banks from certain activities and investments. The rule prohibits US insured depository institutions, bank holding companies, and their US or overseas affiliates from engaging in short-term proprietary trading, and from investing in or sponsoring hedge and private equity funds. Market making, underwriting, and risk-mitigating hedging are exempt—as, notably, are transactions in the obligations of the US government and agencies, Government Sponsored Enterprises, and state/local governments. The conformance period is two years, until July 2014, and can be extended by up to three additional one-year periods.

The proposed Volcker Rule, issued for comment last October, generated a large response and highlighted potential adverse effects on:

- Liquidity of non-US sovereign bond markets, if the proprietary trading ban impacts the large role currently played by US banks in their secondary markets.
- Global risk and liquidity management operations for both non-US and US banks could be constrained.
- Extra-territorial effects as the rule prohibitions apply to foreign affiliates of US banks, which often play an important role overseas, but also because such restrictions would extend to non-US transactions of non-US banks when a US resident or facility is involved.
- Feasibility and compliance costs—particularly, the burden of proving that market making is not proprietary trading.

23 Volcker Rule

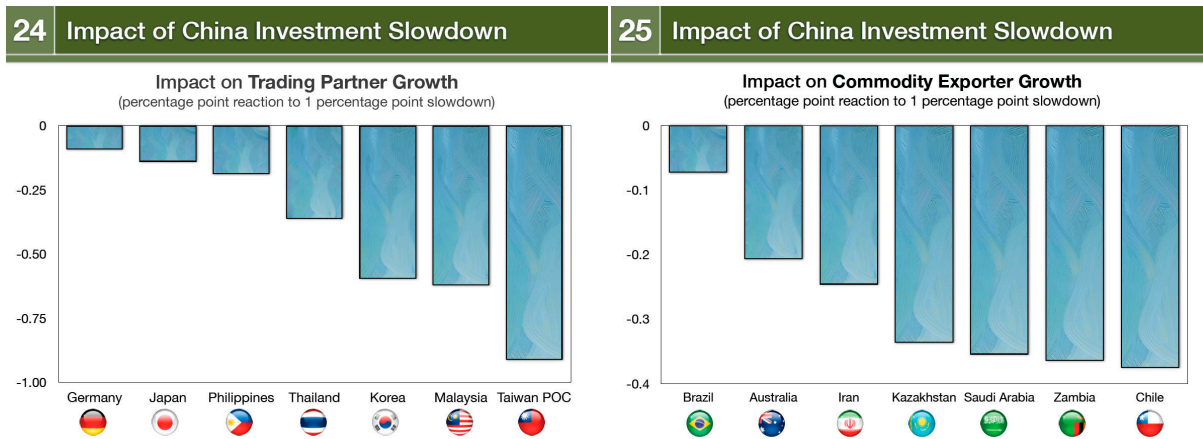


US authorities are working to address the comments received and have indicated that the final rule will be issued after the statutory deadline of July 21, 2012. The authorities noted that ensuring an appropriate definition of market-making activity would address many of the concerns expressed. Agencies also have discretion to grant additional exemptions from the Volcker Rule, as long as these “promote and protect the safety and soundness of the [involved] banking entities and the financial stability of the United States.”

Assessing the Volcker Rule’s impact is difficult due to data gaps and uncertainty on the final rule and its implementation. Additional data, such as the intent and purpose of exposures on banks’ trading books, will be needed, but it may still be difficult for supervisors to establish a clear demarcation between permitted and banned activities.

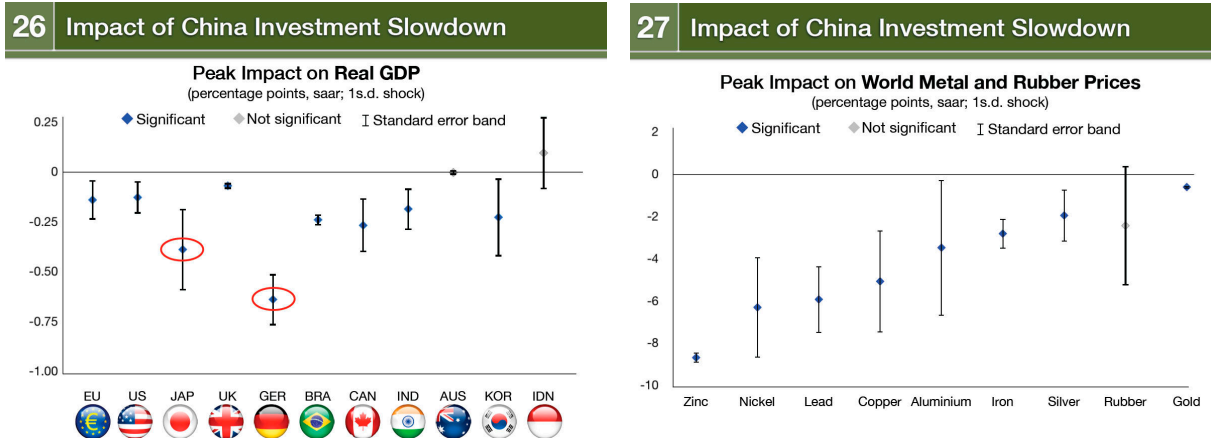
18. **A slowdown in investment.** It is useful to consider this possibility for a variety of reasons. First, investment has risen from an already high level that reflects not only fundamentals but also economic distortions, as discussed in last year’s China spillover report. Second, recognizing this problem, a *gradual* reduction in investment—along with an accompanying shift to consumption—is a key policy goal in China, supported by its partners and the Fund. Third, a *sharp* reduction in investment, even if a low probability event, would have major global repercussions, not least because it would not give sufficient time for a smooth handover to consumption as a source of growth. Three techniques are used to focus on spillovers from lower investment.

- Simple regressions suggest that a 1 percentage point cut in Chinese investment growth (which has averaged 14 percent) has large growth effects on Asian supply chain countries and less-diversified commodity exporters; the effects on advanced countries such as Japan and Germany are smaller but not trivial (Figs. 24–25).



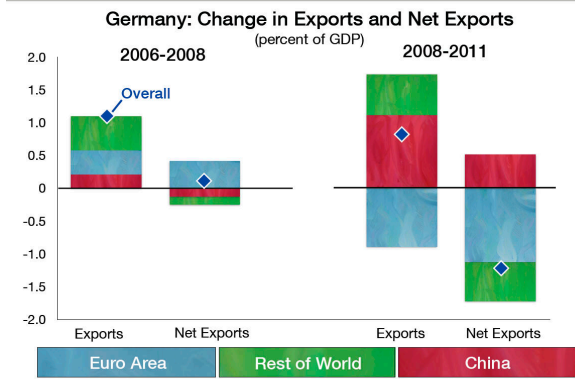
See background paper 13: *Investment-Led Growth in China: Global Spillovers*.

- Factor augmented vector autoregressions show much larger effects on commodities and on several advanced economies (Figs 26–27). Some elasticities are strikingly high, notably for Germany and Japan, which suffer similar cumulative losses (though the *peak* loss, shown below, is higher in Germany). The higher elasticities may reflect the model used, which unlike the previous set, incorporates second and third round effects (i.e., highly open economies are hit not only directly but also via the hit to partners).



- A direct accounting approach for large economies shows that the contribution to growth from exports to China has increased appreciably after the global crisis. While the exercise does not provide a causal effect of specific spillovers from China’s elevated investment activity since the crisis, it does confirm the result from the regression exercise regarding the growing influence of China on exporters of capital goods such as Germany, Japan, and Korea. In the case of Germany, the most vibrant economy in a flagging region, the contribution of China is notable (Fig. 28).

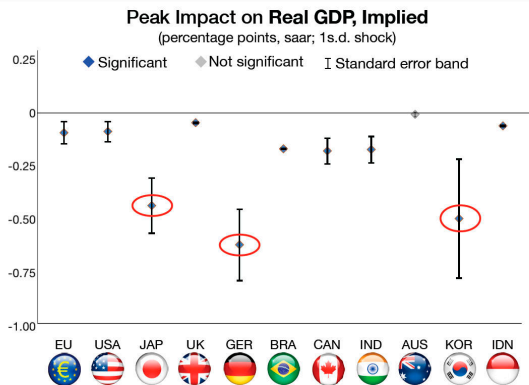
28 Role of China Imports



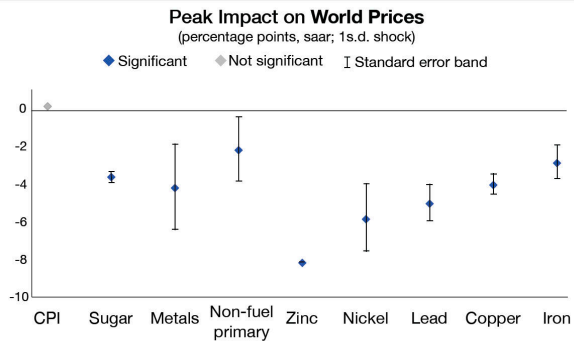
See background paper 14: *China's Trade Balance Adjustment*

19. **China's property sector.** Real estate investment accounts for a quarter of all investment and has grown rapidly in recent years. Although measures to cool the housing market have worked, a sharper slowdown cannot be ruled out, especially given more severe external headwinds. Factor-augmented vector autoregressions suggest significant spillovers, in some cases even larger than for total investment (Figs. 29–30). The latter reflects the fact that real estate is one of the most significant independent sources of final demand in China, with major backward and forward linkages to sectors that profoundly affect domestic demand and imports. It also highlights the role of real estate as the principal form of collateral, amplifying the effect on aggregate demand through financial accelerator effects.

29 China Real Estate Slowdown



30 China Real Estate Slowdown



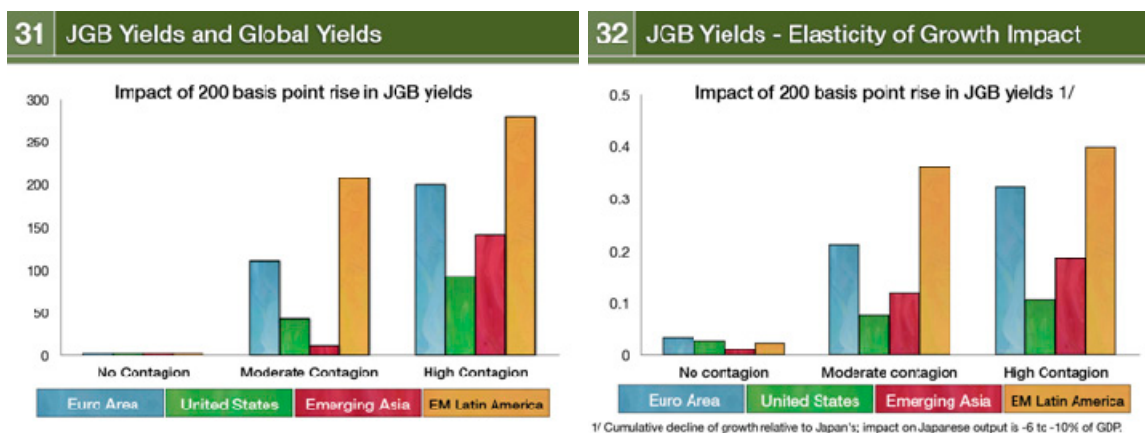
See background paper 15: *The Spillover from a Downturn in China's Real Estate Investment*.

V. JAPAN

Japan is recovering well since its earthquake but high sovereign debt leaves the country vulnerable to a shift in market sentiment, with important consequences for many regions. Meanwhile, a stronger yen points to FDI outflows, benefiting several Asian economies.

20. **Sovereign yields.** At a time when Japan Government Bonds (JGBs) are receiving safe haven flows due to European stresses and yields are at multi-year lows, it is hard to conceive of a spike in yields. There are other good reasons for doubting it, including the stability of the mostly domestic funding base. Yet given the high debt stock, the declining trade balance, and a population dynamic that reduces domestic savings—if further fiscal consolidation is not implemented—and forces greater recourse to a more volatile external funding base, a jump in yields in the medium term cannot be precluded.

21. **Jump in JGB yields.** This can be examined in two steps. First, correlations between JGBs and other sovereign yields during less and more stressful periods give an indication of the potential financial spillover—the impact of a 200 basis point rise is shown below, similar to the ones in the euro area and US simulations (Fig. 31). Second, using the GIMF, the resulting growth impact can be examined (Fig. 32). Although a medium term risk, were the jump to occur today, when most advanced country policy rates are at the zero bound, it would result in Japanese output falling below its baseline path by a cumulative 6–10 percent (the higher number under greater contagion to foreign yields), and foreign output declining by about 1 percent in the United States and 2–3 percent in Emerging Asia and the Euro Area over the medium term. The main transmission channel is the tightening of financial conditions from the rise in risk premia, which hits systemic advanced economies. The impact on emerging Asia is moderate, despite Japan's close regional ties, partly because the effect on China's risk premium is small. Finally, it may be noted that the larger impact on Latin America could reflect Japanese fx retail positions in investment trusts in countries such as Brazil; the larger effect on Europe relative to the United States likely reflects the size and depth of US financial markets, which is also reflected in a lower transmission of higher JGB yields to US yields.



See background paper 16: *Outward Spillovers from a Sharp Rise of Government Bond Yields*.

22. **Japanese FDI.** One spillover from global financial stresses that has implications for many Asian countries, but is not captured in any of the preceding analyses, has to do with its effects on Japanese foreign direct investment. Specifically, safe haven flows into Japan due to outside stresses can be expected to—indeed, already have—put upward pressure on the yen. In the euro area intensified crisis scenario, for example, the yen appreciates moderately in real effective terms. Such developments would add further impetus, beyond structural factors, for Japanese FDI outflows to Asia. For a panel of Asian emerging market countries, the impact of a 1 percent of GDP rise in Japanese FDI boosts growth by 0.5–0.7 percentage points (second and fourth columns in Fig. 33). The higher growth effect relative to FDI from other countries may have to do with Japanese FDI being more heavily oriented towards manufacturing.

33 Japanese FDI

Moderate Growth Spillovers to Emerging Asia
FDI Inflows and Growth in Asian Emerging Economies (1985-2010)

	IMPACT ON REAL GDP GROWTH			
	Alternative regression specifications:			
	(1)	(2)	(3)	(4)
Δ FDI in percent of GDP	0.360*		0.490*	
	0.132		0.037	
Δ FDI other countries in percent of GDP		0.346*		0.478*
		0.136		0.036
Δ FDI Japan in percent of GDP		0.584		0.685*
		0.548		0.254
[Other variables not shown]				
Estimation	OLS	OLS	Dyn Panel	Dyn Panel
Δ FDI Instrumented (with tags)	N	N	Y	Y
Year Fixed Effects	Y	Y	-	-
Country Fixed Effects	Y	Y	-	-
Observations	204	204	195	195
R-square (overall/wo FE)	0.67/0.22	0.67/0.21	-	-

See background paper 17: *Spillovers through Japanese Overseas Direct Investment.*

VI. UNITED KINGDOM

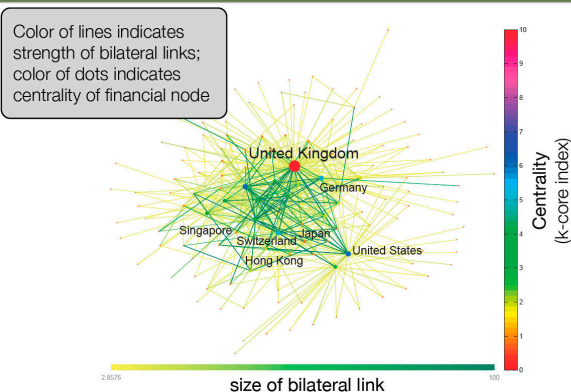
Further analysis of the UK financial system confirms it is a global public good, requiring the highest quality supervision and regulation.

23. **Financial regulation.** Last year's UK spillover report highlighted the role of its financial sector in intermediating global savings and providing the market/legal infrastructure for financial services. The UK financial system thus serves as a global public good, warranting the highest quality supervision and regulation. Further staff analysis brings a new perspective to this conclusion.

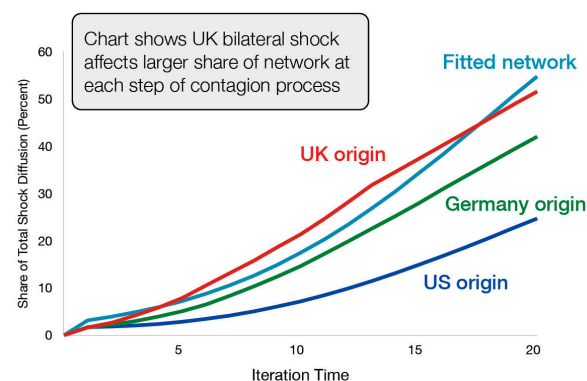
24. **The UK in the global financial network.** Looking at BIS location data on cross-border holdings, it is apparent that the UK is "central" to the global financial network in the sense of having many large connections to other nodes, including to other well-connected nodes. But the UK is also central in the sense of lying on the path between other nodes, reflecting its role as a financial platform where a bank from a second country raises money in a third country to lend to a fourth. On

this measure of centrality, the UK exceeds all other financial centers, including larger ones like the United States (Fig. 34). For this reason, a shock to a link with the UK can spread through the network faster than shocks to links unconnected to the UK (Fig. 35). In this stochastic simulation, a bilateral link between two nodes is shocked—e.g., a claim or an obligation may be affected due to an event on either end of the link. A random process of infection of neighboring links ensues, with larger links given a larger probability of infection. The chart shows that within fifteen iterations from the initial “infection” of a bilateral link with the UK, 35 percent of the network is infected, versus less than 25 percent for a shock originating in Germany and only 15 percent for the United States. (The surprisingly small US figure reflects the fact that the preponderance of its banking connections are within the United States and that many links go to less extensive nodes such as Mexico and Canada; so unless a shock happens to hit a US global investment bank, it travels less far.)

34 Network Centrality



35 Diffusion of Bilateral Shocks



See background paper 18: *The Role of the UK in Propagating Financial Shocks*.

25. **UK GSIBs.** The GSIBs analysis cited in Section II also identifies two UK banks as having high potential to generate spillovers. These UK institutions are also among the most susceptible to spillovers from others, and are more likely to be affected in times of market stress, including dislocations in funding markets or a generalized sell off in broader asset markets. A freeze in wholesale funding markets would hit UK banks particularly hard, exacerbating their deleveraging both in the UK and outside. By contrast, a sovereign shock would affect the UK only indirectly through stress and deleveraging of foreign banks.

VII. CONCLUDING THOUGHTS

The foregoing points to the need for stronger steps to prevent the shocks that generate global spillovers. But were one to materialize, a coordinated reaction, going beyond standard policy bounds, could attenuate the effects.

26. **Spillover risks.** The shocks that could give rise to spillovers were selected based on the concerns identified by partners. Many are clearly tail risks—and hopefully will be prevented from

materializing. But this cannot be taken for granted. The spillovers from policy inaction or mistakes would be severe without global responses and still significant with responses. In important ways, the models used to quantify spillover effects understate matters—among other things, they do not account for amplification from banking fragility and feedback loops.

27. **Preventing shocks.** These risks put a premium on the policy actions advocated in the Article IV staff reports for the systemic economies because the consequences of inaction fall on other countries as well. Specifically:

- In the Euro Area, the situation calls for a policy game changer, with urgent steps to banking union (now finally moving ahead), fiscal integration, phased fiscal consolidation and monetary accommodation. Structural reforms must raise growth across—and fix competitiveness problems within—the euro area.
- In the United States, the priority must be to remove the threat of too sharp fiscal adjustment in 2013, and adopting a credible plan for medium-term adjustment. The recovery can be supported with action on housing and monetary accommodation. Financial reform should be mindful of potential adverse effects on others.
- In China, it means preparedness to adapt macro policies to any unexpected weakening in global prospects, and steps to rebalance domestic demand gradually from investment to consumption.
- In Japan, the medium-term fiscal adjustment plan now under consideration in the Diet should be doubled to 10 percent of GDP, supported by reforms to raise growth and by monetary easing to escape deflation.
- In the UK, further steps are needed to fortify the financial system and to underpin confidence in the banks and market institutions that render it a global platform.

28. **Attenuating spillovers.** Were a shock to occur, policy responses in other economies can reduce global spillovers. For example, in the case of intensified euro area stress, the staff simulation finds that just the use of automatic fiscal stabilizers in the other systemic advanced economies reduces their output losses by 15–25 percent; the mitigation is close to one half across China and other economies if they also react with conventional monetary policy easing (for which they have space). But conventional policies are not the only option. Responses such as quantitative easing can prevent asset prices from collapsing, greatly attenuating spillovers through bond markets, and perhaps more importantly, stock prices. Previous staff work has shown that coordinated policy reaction is usually more effective, even ignoring the confidence effects it induces. Cooperation will also be crucial to averting its antithesis—a global patchwork of trade and capital flow restrictions.