

# IMF POLICY PAPER

## GLOBAL IMPACT AND CHALLENGES OF UNCONVENTIONAL MONETARY POLICIES

October 7, 2013

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## GLOBAL IMPACT AND CHALLENGES OF UNCONVENTIONAL MONETARY POLICIES—BACKGROUND PAPER

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## Glossary

AE	Advanced Economy
ASFR	Asymptotic Single Factor Risk
BCB	Central Bank of Brazil
BoE	Bank of England
BoJ	Bank of Japan
BOK	Bank of Korea
CBRT	Central Bank of the Republic of Turkey
CDS	Credit Default Swap
CFMs	Capital Flow Management Measures
ECB	European Central Bank
EME	Emerging Market Economy
ETF	Exchange-traded Funds
FCL	Flexible Credit Line
FDI	Foreign Direct Investment
Fed	United States Federal Reserve
FOMC	Federal Open Market Committee
FX	Foreign Exchange
IOF	Financial Transaction Tax
LSAP	Large Scale Asset Purchase
LTRO	Long Term Refinancing Operation
LTV	Loan-to-Value
MBS	Mortgage Backed Securities
NPL	Non-performing Loan
OMT	Outright Monetary Transactions
QE	Quantitative Easing
QQME	Quantitative and Qualitative Monetary Easing Program
REER	Real Effective Exchange Rate
SMP	Securities Market Program
UMP	Unconventional Monetary Policies
WGBI	World Global Bond Index

## NON-UMP COUNTRY CASE STUDIES<sup>1</sup>

1. **This section provides case studies of 13 of the largest non-UMP countries.** The case studies begin with an overview of recent macro-economic developments as well as capital flow patterns during the crisis up to the first U.S. tapering announcement in May 2013. Country experiences with capital inflows are judged along five dimensions: (i) the size of capital inflows, (ii) policies used to manage inflows, (iii) external stability, measured by exchange rate overvaluation and current account deficits relative to fundamentals,<sup>2</sup> (iv) asset price and credit market reactions, and (v) financial sector stability. Case studies mostly draw on published IMF Staff Reports for each country, as well as the 2013 Pilot External Stability Report (IMF 2013d).
2. **The prospects for capital outflows draw on assessments of countries' exposure and resilience.** This is as explained in detail in the main paper (Box 7). Exposure measures the likelihood of market volatility and capital outflows following tapering in advanced economies (AEs) (in practice, in the United States (U.S.)). Resilience measures the ability of countries to withstand the pressures from potential market volatility and capital outflows. The exposure and resilience of countries is judged using the indicators described and explained in Table 1 and shown in Appendix Table 1.
3. **Some caveats should be raised.** First, the list of exposure and resilience indicators is by nature incomplete—it could be expanded—and different indicators are more or less appropriate for different countries. Second, economic developments are bound to change quickly and new evidence on countries' exposure and resilience will continue to emerge. The assessment provided in this Background Paper only takes into account data through mid-August 2013 when possible. Thus, any conclusions are preliminary.
4. **This said, non-UMP countries differ considerably in their measured exposure and resilience.** The more developed non-UMP economies (Australia—higher resilience, as well as Canada and Korea—lower exposure) as well as other Emerging Market Economies (EMEs) with higher resilience and/or lower exposure are expected to fare relatively well following a U.S. exit. Other countries appear more vulnerable (due to both higher exposure and lower resilience), and some are borderline cases between these two extremes.

<sup>1</sup>Prepared by Chikako Baba, Jiaqian Chen, Salim Darbar, Tomas Mondino, and Manmohan Singh (all MCM).

<sup>2</sup>The assessment of the current account and the real effective exchange rate relative to medium term fundamentals and desirable policies is taken from the 2013 Pilot External Sector Report (IMF, 2013d). These assessments were prepared in May 2013.

**Table 1. Measures of Exposure and Resilience**

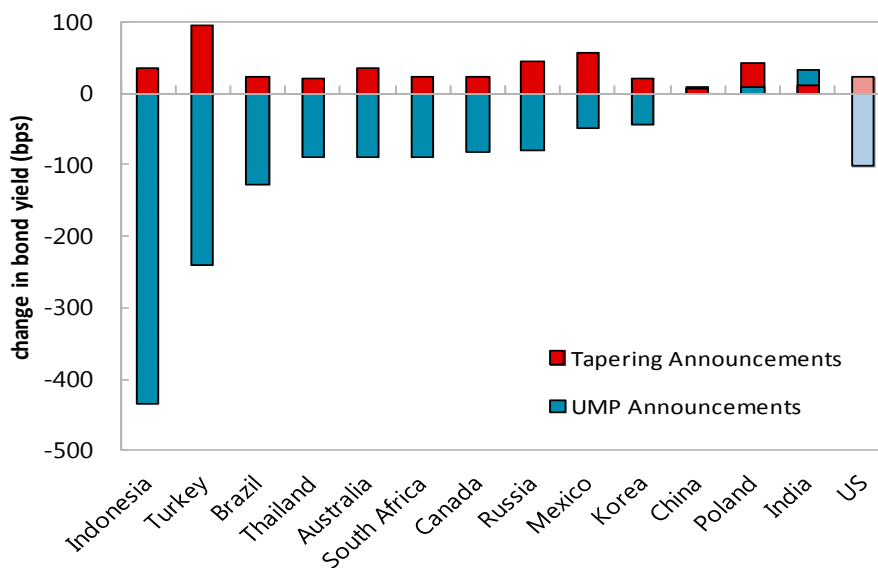
Indicators	Definition	Criteria measuring vulnerability
<b><i>Exposure: market volatility</i></b>		
Sensitivity to a change in U.S. long-term bond yield	Based on regressions of non-UMP country 10-year bond yields on U.S. 10-year bond yields. The regression was run in changes over two-day intervals immediately following U.S. Federal Open Market Committee (FOMC) announcements between January 1, 2003 and May 20, 2013.	Larger correlations indicate higher sensitivity to U.S. monetary shocks. Insignificant coefficients suggest no historical sensitivity to U.S. monetary shocks.
Change in long-term bond yields following U.S. tapering announcements	Cumulative change in a country's 10-year bond yields in two days following the tapering announcements by the U.S. Federal Reserve Bank (Fed) on May 22 and June 19, 2013.	Larger changes suggest high sensitivity to the tapering announcements.
<b><i>Exposure: capital outflows</i></b>		
Net inflows following U.S. tapering announcements	Average EPFR Global bond and equity fund flows in the month following the Fed tapering announcement of May 22, 2013, relative to average monthly flows since 2009, normalized by the standard deviation of flows (Z-score).	Z-scores of -2 or lower indicate net inflows fell by more than 2 average standard deviations.
Sovereign credit rating	Lower of Moody's and S&P ratings, and expressed in terms of S&P ratings.	Better rating suggests lower risk of outflows amidst market turmoil as investors seek safety.
<b><i>Resilience: domestic market conditions</i></b>		
Market capitalization	Market value of listed companies expressed in percent of GDP.	High market capitalization suggests that capital outflows should have a lower effect on prices.
Turnover ratio	Total value of shares traded divided by the average market capitalization.	High turnover ratio suggests that capital outflows should have a lower effect on prices.
Size of domestic institutional investors	Market size of pension, mutual fund and insurance companies, in percent of external debt.	Larger domestic investment funds have a greater potential to substitute for foreign investors in case these withdraw their funds.
<b><i>Resilience: dependence on foreign funding</i></b>		
Foreign equity liabilities	Foreign ownership of domestic equities in percent of GDP.	A larger foreign ownership share of equity or debt (especially of short-term maturity) exposes markets to volatility and borrowers to a funding shortage in the case of capital outflows.
Total external debt	Gross external debt in percent of GDP (all sectors).	

**Table 1. Measures of Exposure and Resilience (concluded)**

<b><i>Resilience: policy room</i></b>		
Fiscal policy room	Primary balance adjustment (in percent of GDP) necessary to achieve debt target in 2030 (from the IMF Fiscal Monitor, April 2013 (IMF 2013e)).	Higher required adjustment suggests reduced fiscal space to withstand higher funding costs and support the financial sector if necessary.
Monetary policy room	Inflation gap from its target and output gap.	Negative inflation gap (projected inflation below target) or negative output gap (output below potential) indicate less room to accommodate higher interest rates coinciding with potentially large capital outflows.
Room for exchange rate adjustment	Differences in Real Effective Exchange Rate (REER) relative to its level consistent with medium term fundamentals and desirable policy (as of May 2013, taken from the 2013 External Stability Report, IMF 2013d).	When the currency is overvalued, there is greater room for depreciation without disrupting the economy.
Trade balance	Trade balance for goods and services in percent of GDP.	A surplus indicates more room for currency depreciation (though in the longer run a depreciation will improve the trade balance for deficit countries).
Foreign Exchange (FX) reserves	FX reserves in months of import cover.	Larger FX reserves indicate greater room for intervention in FX markets to dampen potentially excessive depreciation.
Bank capital ratio	The ratio of bank capital and reserves to total assets. Capital includes tier 1 capital and total regulatory capital. Total assets include all nonfinancial and financial assets.	Higher capital ratios offer higher loss-absorbing buffers—and suggest lower leverage—suggesting lower pressure to sell assets in a downturn and lower risks to financial stability.
Non-performing loans (NPLs)	NPLs to total gross loans.	Higher NPLs suggest weaker banks and thus higher financial stability risks as funding becomes scarcer and more expensive.

**5. Evidence from the second and third indicators of “exposure” is illustrated below.** It is noteworthy that countries showing the largest response to U.S. Federal Reserve announcements of bond purchases did not necessarily show the largest response to tapering announcements. This may be due to the changing nature of investor positioning and market liquidity.

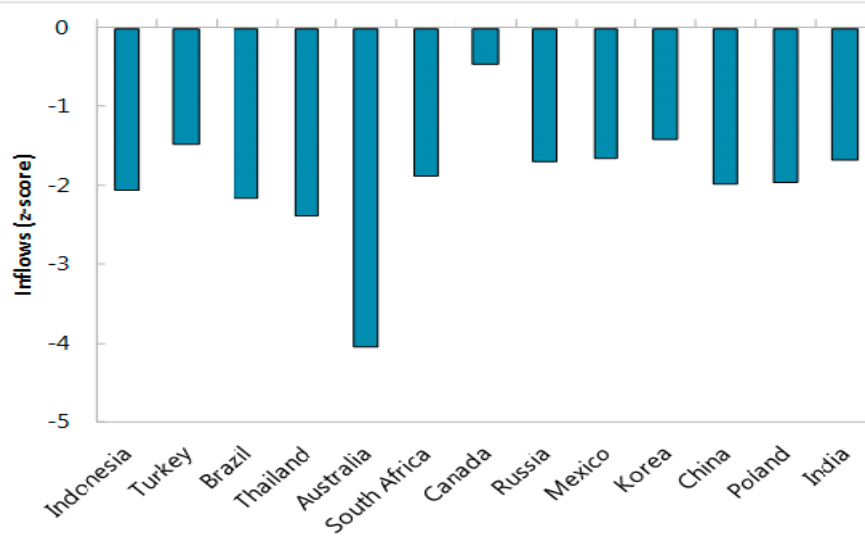
**Figure 1. Total Cumulated Changes in 10-year Bond Yields Following U.S. LSAP Announcements and Tapering Announcements**



Source: Fund staff estimates.

Note: Changes in yields are computed in the day following each announcement, then cumulated. Tapering announcements occurred on May 22 and June 19, 2013.

**Figure 2. Measure of Capital Outflows Following U.S. Tapering Announcements**



Sources: EPFR Global and Fund staff estimates.

Note: Z-scores represent the difference of average capital flows (equity and bond) in the month after first U.S. tapering announcement (May 22, 2013) relative to flows since 2009, normalized by the standard deviation of flows.



## Australia

Background	
<p><b>Growth</b> has slowed to 2.6 percent in the first quarter of 2013, slightly below its trend in recent periods. Growth is expected to remain soft in the near term as the commodity cycle unwinds, and the economy transitions away from resource and investment led growth to broader based growth. <b>Inflation</b> has remained contained within the Reserve Bank of Australia's (RBA) target range of 2–3 percent. The <b>monetary policy</b> rate is at 2.5 percent after a series of cuts from 4.75 percent since 2011. The objective of <b>fiscal policy</b> is to gradually move to budget surplus; however, buffers may be needed to buoy the economy. <b>External debt</b> is relatively low, net external liabilities are high (about 60 percent of GDP) stemming from foreign direct investment (FDI) into the mining sector, and portfolio investment. The <b>capital account</b> is open with limited intervention in the Australian dollar since 1983.</p>	
Capital inflows (up to the May 2013 tapering announcements)	
<p><b>Capital inflows</b> quickly recovered from the crisis, though have recently decreased. Gross inflows stand at US\$60 billion in 3Q 2012 (4Q rolling sum), similar to their 2000–07 average. Capital inflows in recent years have been largely directed towards government debt securities. Nonresidents hold about 75 percent of Australian debt stock (an increase of 15 percent since end-2009). Inflows (including carry trade type of fast money), were strong on the back of interest differentials relative to world markets, the strength of the Australian dollar, and demand for Australian debt. More recently, foreign investors have been reportedly repatriating funds from Australia following the RBA rate cuts, and the Australian dollar has depreciated by nearly 15 percent between April and mid-August 2013.</p>	
Coping with inflows	Potential vulnerabilities
<ul style="list-style-type: none"> <li>• <b>The policy response</b> to capital inflows was passive, mainly allowing the exchange rate to appreciate.</li> <li>• <b>Exports</b> have remained mostly robust despite an appreciating currency and have continued despite the recent dim outlook for commodities. The <b>REER</b> appreciated by almost 40 percent between late 2008 and April 2013.</li> <li>• The cyclically-adjusted <b>current account deficit</b> was assessed to be around 1–2 percent of GDP weaker than implied by medium-term fundamentals and desirable policy settings, partly due to capital expenditures in the resources sectors. Estimates also pointed to a REER overvaluation as of May 2013 (IMF 2013d).</li> <li>• <b>Asset prices</b> have buoyed on the back of rising house prices and capital inflows.</li> <li>• The <b>banking sector</b> is mostly stable with satisfactory capital buffers and/or appropriate hedges. The <b>corporate</b> sector will need to adjust to the transition away from resource and investment led growth towards broader based growth.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Exposure:</b> Australian long-term rates are historically sensitive to U.S. monetary policy shocks, based on regression results. The recent jump in U.S. yields of 25 bps immediately following U.S. tapering announcements led to a contemporaneous 35 bps jump in Australian long-term rates. Furthermore, inflows fell significantly in the month following the recent U.S. tapering announcements (z-score of -4.04). See Appendix Table 1 for details on the above results. Australia's strong credit rating, though, may prevent larger capital outflows.</li> <li>• <b>Resilience:</b> Nonresident holdings of government debt have increased, while banks' reliance on short-term wholesale external funding has declined and foreign liability positions are largely hedged. Australia's deep and liquid financial markets should be better suited to deal with shocks.</li> <li>• The exchange rate has some space to depreciate. Fiscal policy space is sufficient.</li> </ul>

## Brazil

### Background

**Growth** slowed to 0.9 percent in 2012—the lowest rate since 2009. Headline **inflation** is close to the upper band of the Central Bank of Brazil's (BCB)  $4\frac{1}{2} \pm 2$  percent target range. **Monetary policy** has been accommodative, but the BCB has recently embarked on a tightening cycle and increased the policy rate by 175 bps since April 2013, as of August 2013. The impulse from **fiscal policy** (excluding policy lending) is anticipated to be broadly neutral during 2013. Gross public debt stood at 68 percent of GDP in 2012, about 3–4 percentage points of GDP higher than the pre-crisis levels.<sup>3</sup> **External debt** is about 14 percent of GDP, with mostly long-term maturities. Brazil has made wide use of **capital flow management measures (CFMs)** in response to large capital inflows.

### Capital inflows (up to the May 2013 tapering announcements)

**Capital inflows** increased significantly after 2009, in part due to strong growth prospects and high interest rate differentials. In 2010 gross inflows amounted to US\$162 billion (7.4 percent of GDP)—exceeding the pre-crisis peak at US\$125 billion. However, in the past year capital inflows have been moderate at US\$104 billion due to a slowdown in the economy, lower interest rate differentials, and a broadening of CFMs. Net portfolio inflows—both **debt** and **equity**—have declined the most, while net **FDI** inflows have remained mostly stable at levels sufficient to cover the current account deficit.

### Coping with inflows

- **The policy response** to capital inflows included exchange rate adjustments, with some interventions to mitigate volatility, prudential measures, such as reserve requirements and ample use of CFMs such as the financial transaction tax (IOF). Since late 2011, authorities started relaxing some of these measures.
- **The trade balance** as a percent of GDP has worsened since 2009 due to eroding competitiveness, driven in part by exchange rate appreciation during 2009–11, and more recently lower commodity prices.
- The cyclically-adjusted **current account** deficit was assessed to be moderately larger than implied by medium-term fundamentals and desirable policies of about  $-1\frac{3}{4}$  to  $-2\frac{3}{4}$  percent of GDP. The **REER** was deemed moderately overvalued (IMF 2013d), but depreciated recently.
- **Asset prices** have evolved moderately since 2008. 10Y government local currency bond yields decreased to less than 10 percent by mid-May 2013 but have risen since then. Equity prices have been trending lower. Real-estate prices in some cities rose sharply while housing credit expanded strongly from a low base.
- The **banking sector** is stable with ample capital buffers. **Corporate** leverage and external debt have increased since 2010, while remaining within historical ranges. Liquidity has improved as maturities have lengthened.

### Potential vulnerabilities

- **Exposure:** Brazilian long-term rates are historically sensitive to U.S. monetary policy shocks, based on regression results. Moreover, Brazil's financial markets are very sensitive to global financial conditions (higher beta than most EMs). The recent jump in U.S. yields of 25 bps immediately following U.S. tapering announcements led to a contemporaneous 24 bps jump in Brazilian long-term rates.
- Furthermore, capital inflows as measured using high frequency mutual fund data fell significantly in the month following the recent U.S. tapering announcements (z-score of -2.15). See Appendix Table 1 for details on the above results. The balance of payments, for which coverage is much wider, suggest that flows have in fact picked up somewhat.
- **Resilience:** Although neither the banking nor corporate sectors are heavily dependent on foreign funding, capital flow reversals could complicate the funding of Brazil's current account deficit.
- In the event of significant outflows, there is some policy space. Large accumulated reserves (US\$374 billion) can be used to prevent FX overshooting or disorderly adjustments. The BCB recently announced a substantial program of preannounced interventions to limit such risks. The BCB can also lower reserve requirements from current high levels to ease liquidity pressures in the banking system.

<sup>3</sup> Unlike the authorities' definition, gross general government debt here comprises treasury bills on the central bank balance sheet not used in repurchase agreements.

## Canada

Background	
<p><b>Growth</b> slowed to 1.7 percent in 2012, below its medium-term potential at around 2 percent, but rebounded in Q1 2013 driven by stronger external demand. The <b>current account deficit</b> widened to 3.4 percent of GDP in 2012 but is projected to narrow somewhat in 2013. <b>Inflation</b> in H1 2013 has been lower than 1 percent (yoy), well below the 2 percent inflation target. The current accommodative <b>monetary policy</b> stance remains appropriate. The external gross <b>debt</b> is low relative to other advanced economies but is expected to gradually increase over time. The federal government and some provinces have <b>fiscal</b> space to respond if the near-term economic outlook deteriorates. The <b>capital account</b> is fully open with no unilateral intervention on the Canadian dollar since 1998.</p>	
Capital inflows (up to the May 2013 tapering announcements)	
<p><b>Capital inflows</b> have remained strong, especially post-2007 as Canada has been perceived as a safe haven. Average net <b>portfolio</b> outflows from 2000–07 turned into inflows of close to 5 percent of GDP per year on average in 2009–12. The share of Canadian <b>debt securities</b> in the U.S. investors' bond portfolio increased from 11 percent in 2007 to 16 percent in 2011. About one-third of non-financial private sector credit is financed by external sources, and Canadian banks have a non-negligible dependence on wholesale funding denominated in foreign currency.</p>	
Coping with inflows	Potential vulnerabilities
<ul style="list-style-type: none"> <li>• There has been no specific <b>policy response</b> to capital inflows per se. The currency appreciated in line with a flexible exchange rate policy. Macroprudential measures were taken since 2008 to moderate the expansion of mortgage credit and house prices.</li> <li>• <b>Exports</b> have been weak for over a decade (though rebounded in 2010–11), reflecting a loss of external competitiveness.</li> <li>• The cyclically-adjusted <b>current account</b> deficit of around 2½ percent of GDP in 2012 is 1–3 percentage points larger than the value implied by medium-term fundamentals and desirable policies. The current account deterioration in recent years reflects Canada's stronger economic rebound relative to its main trade partners, as well as the significant real appreciation of the Canadian dollar and its weak productivity growth. The deficit has been largely financed by foreign purchases of Canadian debt. The <b>REER</b> was deemed moderately overvalued (IMF 2013d).</li> <li>• Despite recent moderation, <b>housing prices</b> are above levels consistent with economic fundamentals, and household debt remains at a historical high relative to disposable income.</li> <li>• The <b>banking sector</b> is stable with satisfactory capital buffers that are in line with the Basel III initiative.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Exposure:</b> Canadian long-term interest rates are historically sensitive to U.S. monetary policy shocks, based on regression results. The recent jump in U.S. yields of 25 bps immediately following U.S. tapering announcements led to a contemporaneous 23 bps jump in Canadian long-term rates. However, inflows did not significantly fall in the month following the recent U.S. tapering announcements (z-score of -0.46). See Appendix Table 1 for details on the above results.</li> <li>• Canada's high credit rating lowers the probability of significant capital outflows.</li> <li>• <b>Resilience:</b> Canada's domestic capital market is relatively deep, as indicated by its high market capitalization. Although Canada has high dependence on foreign funding, net external liabilities are relatively modest, and a sizeable fraction of its external liabilities is denominated in Canadian dollars.</li> <li>• If long-term interest rates were to overshoot following a U.S. exit, risks could increase of a disorderly rebalancing of housing prices, and associated pressures on household balance sheets.</li> </ul>

## China

Background	
<p><b>Growth</b> has moderated to 7.8 percent in 2012, near the authorities' target. <b>Inflation</b> slowed down to 2.5 percent in 2012. <b>Monetary policy</b> has been prudent, while growth in the monetary aggregate so far this year exceeded the annual target of 14 percent. The <b>fiscal policy</b> is proactive. Expansion in off-budget and quasi-fiscal activity has supported demand since the global financial crisis. The <b>central government debt</b> declined to 14.4 percent of GDP in 2012. However, expanding the definition of government to include local government finance vehicles and off-budget funds would lead to a higher figure. The <b>capital account</b> remains subject to a broad range of capital controls on both inflows and outflows covering the bulk of non-FDI portfolio flows and external borrowing.</p>	
Capital inflows (up to the May 2013 tapering announcements)	
<p><b>Capital inflows</b> are increasing steadily and dominated by robust <b>FDI</b> (equal to net FDI was US\$230 billion, inward FDI was equal to 3.8 percent of GDP in 2011). In 2012, China experienced net capital outflows of around US\$20 billion, a large turnaround from the net capital inflows of the previous years. Yet, since Q1 2013, net capital inflows seem to have resumed, along with appreciation pressures.</p>	
Coping with inflows	Potential vulnerabilities
<ul style="list-style-type: none"> <li>• China has used reserve requirements, higher interest rates, tighter prudential measures, direct administrative limits and currency intervention to moderate credit growth and its impacts.</li> <li>• <b>Exports</b> have slowed to 8 percent growth in 2012. The REER appreciated by 19 percent from end-2009 through May 2013 and 35 percent since the mid-2005 exchange rate reform.</li> <li>• Staff's assessment is that the external position appears moderately stronger and the currency moderately undervalued compared with the level consistent with medium-term fundamentals and desirable policies.</li> <li>• The <b>real estate market</b> is susceptible to large cyclical swings. Recently, price growth has picked-up again. The stock of <b>credit</b>, including off-balance sheet and non-bank lending, has increased sharply by 60 percent of GDP in just 4 years since 2009. The <b>stock price</b> index nearly doubled in 2008–09, but decreased by 30 percent from 2010 to May 2013.</li> <li>• Based on reported data, bank balance sheets appear healthy and loan books show only a modest deterioration in asset quality. Non-bank activity, however, has grown significantly in recent years. Rapid financial innovation raises risks, as more lightly regulated entities account for a growing share of new lending, while implicit guarantees on all interest-bearing assets undercut market discipline.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Exposure:</b> Chinese long-term rates are historically not significantly related to U.S. monetary policy shocks, based on regression results. The recent jump in U.S. yields of 25 bps immediately following U.S. tapering announcements led to a contemporaneous 6.8 bps jump in Chinese long-term rates. Nevertheless, inflows fell significantly in the month following the recent U.S. tapering announcements (z-score of -1.97). See Appendix Table 1 for details on the above results.</li> <li>• <b>Resilience:</b> China's low dependence on foreign funding will provide resilience to external shocks.</li> <li>• In the event of significant outflows, ample FX reserves should help cushion the effect of the shocks. Moreover, if growth were to slow too much below the authorities' 7½ percent target, then on-budget fiscal stimulus should be used to support activity, with an emphasis on measures that support rebalancing and protect vulnerable households.</li> </ul>

## India

Background	
<p><b>Growth</b> slowed to 5.0 percent in fiscal year 2012–13, below its potential of 6.5 percent. However, consumer price <b>inflation</b> has remained elevated at around 10 percent. The <b>monetary policy</b> stance has been accommodative, supported by a series of policy rate cuts since April 2012. However, with the rupee coming under pressure more recently, the central bank has resorted to liquidity tightening including interest rate defense measures. <b>External debt</b> remains low at around 21 percent of GDP. A high public deficit and government debt of 67 percent of GDP limit <b>fiscal policy</b> space. The <b>current account</b> deficit reached a record 4.8 percent of GDP in 2012–13. The <b>capital account</b> is relatively closed but has been gradually liberalized to attract FDI and portfolio investment into infrastructure projects and the bond markets.</p>	
Capital inflows (up to the May 2013 tapering announcements)	
<p><b>Capital inflows</b> increased strongly in late 2009 following lower global risk aversion and a sharp growth rebound in India. Net foreign inflows were around US\$100 billion in 2012–13, although remained below the pre-crisis peak of about US\$110 billion. <b>FDI</b> inflows have remained robust in recent years, while <b>debt flows</b> (especially short-term) have increased notably, in part due to lower regulatory hurdles.</p>	
Coping with inflows	Potential vulnerabilities
<ul style="list-style-type: none"> <li>• <b>India's policy</b> supported capital inflows. India relaxed restrictions on external commercial borrowing and more recently on FDI, thereby affecting the composition of capital inflows. The floating rupee has been an important shock absorber and the authorities have intervened only sporadically to contain exchange rate volatility. <b>Exports</b> have remained almost stable since 2008.</li> <li>• The cyclically adjusted <b>current account</b> deficit and the <b>REER</b> were deemed to be broadly in line with medium-term fundamentals and desirable policies (IMF 2013d). However, the rupee is vulnerable to fluctuations in capital flows.</li> <li>• <b>Asset prices</b> have evolved moderately since 2008. After a sharp correction in 2008, 10Y government bond yields increased between 2009 and 2012, then decreased up to May 2013. Regulations on foreign participation in local debt securities have been eased. The equity price index has recovered to its pre-crisis level. Some of these developments have moderated or reversed since May 2013.</li> <li>• The <b>banking sector</b> is mostly stable with satisfactory capital buffers although asset quality has deteriorated considerably. <b>Corporate</b> debt has increased since 2008, and foreign ownership has risen as regulations have been relaxed to increase foreign institutional investor flows into domestic debt.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Exposure:</b> Long-term bond yields are historically not sensitive to U.S. monetary policy shocks, based on regression results. The recent jump in U.S. yields of 25 bps immediately following U.S. tapering announcements led to a contemporaneous 12 bps jump in Indian long-term rates. Yet, inflows fell in the month following the recent tapering announcements (z-score of -1.67), especially on the debt side, with equities following suit to a smaller extent. See Appendix Table 1 for details on the above results. Note India is more an equity than a bond destination, although fixed income flows have been increasing in the last few years.</li> <li>• <b>Resilience:</b> Some of India's markets are shallow and illiquid. The combination of a high current account deficit and dependence on external portfolio debt and equity flows constitutes a key vulnerability.</li> <li>• In the event of significant outflows, overall policy room is limited. Higher interest rates could further widen the output gap. International reserves could be used to dampen exchange rate volatility and overshooting. Finally, fiscal space is limited due to high public deficits.</li> <li>• With the rupee down by 12 percent since the Fed's tapering announcement, as of mid-August 2013, the Reserve Bank of India has tightened money market liquidity drastically. This builds upon liquidity-reducing measures in the FX market. Together with measures aimed at reducing gold imports, the authorities hope to arrest the decline in the rupee and facilitate continuing capital inflows.</li> </ul>

## Indonesia

Background	
<p><b>Growth</b> eased modestly to 6.2 percent in 2012, from its highest level in over a decade reached in 2011. Year-on-year <b>inflation</b> was 4.3 percent at end-2012 within the central bank's target range of 4.5±1 percent, but rose to 8.6 percent in July 2013 following a 33 percent (average) increase in subsidized fuel prices. <b>Monetary policy</b> was loosened starting in August 2011 as global conditions deteriorated and domestic inflation slowed. However, in response to higher inflation and external pressure, the central bank has raised its policy and deposit rates by 125 bps since June 2013 to 7 percent and 5.25 percent respectively, as of end-August 2013. <b>Public debt</b> has fallen to under 25 percent of GDP, from around 76 percent in 2001. <b>Fiscal policy</b> provides a moderate stimulus. The <b>capital account</b> is relatively open, but most banking flows are subject to capital controls.</p>	
Capital inflows (up to the May 2013 tapering announcements)	
<p>Since 2009, Indonesia has remained an attractive destination for <b>capital inflows</b>. In 2012, <b>FDI</b> hit a new high and net <b>debt</b> issuance rebounded somewhat from 2011. Going forward, FDI is expected to be around 1½-2 percent of GDP, with net debt issuance amounting to 1-1½ percent of GDP. About one-third of rupiah government debt is held by nonresidents.</p>	
Coping with inflows	Potential vulnerabilities
<ul style="list-style-type: none"> <li>• <b>The policy response</b> to capital inflows was active. In addition to FX interventions, while allowing for some appreciation, Indonesia lowered the bottom of the interest rate corridor, while keeping the policy rate unchanged, and introduced then tightened CFMs, including a minimum holding period for central bank bills. Prudential limits were introduced on consumer and mortgage lending.</li> <li>• <b>Export</b> revenue continued to rise in 2009–11, buoyed by higher commodity prices and strong regional growth, despite REER appreciation. However, exports subsequently declined.</li> <li>• The cyclically-adjusted <b>current account deficit</b> appears ½–2½ percentage points of GDP weaker than implied by medium-term fundamentals and desirable policies. The deficit mainly reflects weakness in export commodity prices and a trend decline in net oil and gas exports. The <b>REER</b> was deemed approximately fairly valued (IMF 2013d).</li> <li>• <b>Asset prices</b> have risen sharply since 2008. The yield on 10Y government <b>bonds</b> decreased by 600 bps, and the <b>stock price</b> index quadrupled between end-2008 and May 2013. While aggregate <b>property price</b> indices rose in line with CPI inflation, anecdotal evidence suggests a risk in some segments. Some of these developments have moderated or reversed since May 2013.</li> <li>• The <b>banking sector</b> remains profitable and well capitalized, with the capital to risk weighted asset ratio at 16 percent.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Exposure:</b> Indonesian long-term rates are historically highly sensitive to U.S. monetary policy shocks, based on regression results. The recent jump in U.S. yields of 25 bps immediately following U.S. tapering announcements led to a contemporaneous 36 bps jump in Indonesian long-term rates. Furthermore, net inflows fell significantly in the month following the recent U.S. tapering announcements (z-score of –2.05). See Appendix Table 1 for details on the above results.</li> <li>• <b>Resilience:</b> Government debt exposure to foreign funding is high, while that of other sectors is limited but rising. In addition, domestic capital markets are shallow.</li> <li>• In the event of significant outflows, fiscal policy space seems limited.</li> </ul>

## Korea

Background	
<p>Despite <b>growth</b> rebounding to 2.3 percent yoy in 2Q 2013, after a significant slowdown in 2012, the output gap remains negative. <b>Inflation</b> has fallen to 1.4 percent in July 2013, below the central bank's 2.5-3.5 percent inflation target band. In case downward risks materialize, there is ample <b>fiscal space</b> since public debt is at 34 percent of GDP, and monetary policy space due to subdued inflation. As of late 2012, <b>external debt</b> has fallen to 34 percent of GDP, a majority of which is long-term in nature. The <b>capital account</b> is relatively open.</p>	
Capital inflows (up to the May 2013 tapering announcements)	
<p><b>Capital inflows</b> remained volatile—particularly equity and other flows—since 2008. This reflects a combination of domestic factors and global push factors. In net terms, capital inflows stood at US\$-44 billion in 1Q 2013 (4Q rolling sum), well below their 2000–07 average. Outward <b>FDI</b> has gathered pace as Korean corporates have increased their overseas investment, while portfolio <b>debt and equity</b> inflows have increased.</p>	
Coping with inflows	Potential vulnerabilities
<ul style="list-style-type: none"> <li>• <b>Policy response</b> to capital inflows has included macroprudential measures (since 2010) to reduce excessive volatility and overshooting. The central bank re-introduced a withholding tax on foreign purchases of treasury and monetary stabilization bonds to curb capital flow volatility and imposed a levy on banks' non-deposit FX liabilities, in order to lengthen the maturity of external debt. The central bank also intervened in FX markets, which rebuilt reserves to the pre-crisis levels.</li> <li>• After strongly recovering between 2009–11, <b>exports</b> weakened in 2012.</li> <li>• The <b>current account</b> surplus widened from 0.3 percent of GDP in 2008 to 3.8 percent of GDP in 2012, 1–4 percentage points above the value implied by fundamentals and desirable policies. The <b>REER</b> is assessed to be moderately undervalued (IMF 2013d).</li> <li>• <b>Asset prices</b> have not been subject to sustained upward pressure since 2008. Following a post-crisis rebound, equity prices have been volatile and are currently below end-2009 levels. 10Y government bond yields have decreased to around 3.7 percent from 5.8 percent. Housing prices have started falling since mid-2012. Recognizing the potential vulnerabilities from the rapid expansion of non-bank credit to households, the authorities have put in place policy measures which have led to a moderation of non-bank lending.</li> <li>• The <b>banking sector</b> is strong with large capital buffers. While the level of <b>corporate debt</b> is lower than the OECD average, profitability remains subdued and the number of corporates unable to meet interest expenses (a sign of financial distress) has risen to a fairly high level.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Exposure:</b> Korean long-term rates are historically somewhat sensitive to U.S. monetary policy shocks, based on regression results. The recent jump in U.S. yields of 25 bps immediately on U.S. tapering announcements led to a contemporaneous 21 bps jump in Korean long-term rates. Modest outflows from the equity market occurred in the month following the recent U.S. tapering announcements (z-score of -1.42), though inflows into the bond market continued. See Appendix Table 1 for details on the above results. Korea has been affected much less than other EMs due to stronger fundamentals.</li> <li>• Korea's open and integrated financial markets make it more exposed to capital flow volatility, though this vulnerability is considerably reduced relative to 2008.</li> <li>• <b>Resilience:</b> Korea's banking sector is still dependent on foreign funding, though much less than in 2008. Its relatively well-capitalized and liquid equity market will help deal with shocks. Enhanced liquidity and the increased presence of institutional investors, anecdotally believed to be long term investors, in fixed income markets has somewhat reduced potential vulnerabilities.</li> <li>• There is policy room in the event of significant downside risks. Monetary policy could be deployed and fiscal policy has space to provide support if needed.</li> </ul>

## Mexico

Background	
<p>Mexico's economy has been resilient, averaging 4 percent annual <b>growth</b> since 2010—despite a sluggish U.S. recovery and persistent global risks—closing the output gap brought on by the global financial crisis. Following a temporary supply shock in early 2013, headline inflation has come down close to the 3 percent inflation target, and core inflation fell to a record low 2½ percent in July. <b>Monetary policy</b> has remained accommodative since 2009, and the central bank cut the reference rate by 50 bps early this year. Continuing <b>fiscal</b> consolidation to bring down government spending and balance the primary deficit has helped stabilize public <b>debt</b> at around 43 percent of GDP. Mexico has kept an open <b>capital account</b> with deep and liquid financial markets.</p>	
Capital inflows (up to the May 2013 tapering announcements)	
<p><b>Capital inflows</b> have been large during the last years driven by lax global monetary conditions and strong domestic macroeconomic fundamentals. The robust macro fundamentals allowed Mexico to be included in the World Global Bond Index (WGBI) in 2010. Gross inflows stood at US\$86 billion in 2012, exceeding the pre-crisis peak of US\$60 billion. In particular, foreign portfolio debt exposures increased significantly. The share of foreign-held sovereign debt increased by a multiple of 4 to 34 percent since mid-2009 accompanied by an increase in local currency sovereign paper issuance.</p>	
Coping with inflows	Potential vulnerabilities
<ul style="list-style-type: none"> <li>• <b>The policy response</b> to capital inflows has been consistent with Mexico's policy framework, based on the use of monetary and fiscal policy, exchange rate flexibility, the central bank's rule-based FX interventions, and the absence of CFMs.</li> <li>• <b>Exports</b> have increased since 2008 supported by external demand and by subdued unit labor costs in manufacturing, despite a REER appreciation of 10 percent since 2008 through May 2013.</li> <li>• The cyclically-adjusted <b>current account</b> deficit has been stable around 1 percent of GDP, mainly in line with medium-term fundamentals and desirable policies. The flexible exchange rate has been a key shock absorber to volatile external conditions and the <b>REER</b> was deemed fairly valued (IMF 2013d).</li> <li>• <b>Asset prices</b> have increased significantly since 2008. 10Y government bond yields reached all time lows in 2012, while equities increased by 74 percent between January 2009 and May 2013. Banks' credit to the private sector grew 12 percent in 2012, recovering from a steep decrease in 2009. Some of these developments have moderated or reversed since May 2013.</li> <li>• The <b>banking sector</b> is mostly stable with solid capital buffers and limited FX loan exposure. <b>Corporate</b> leverage has remained around 49 percent, while short-term liabilities account for 48 percent of total liabilities.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Exposure:</b> Mexican long-term rates are historically somewhat sensitive to U.S. monetary policy shocks, based on regression results. The recent jump in U.S. yields of 25 bps immediately following U.S. tapering announcements led to a contemporaneous 58 bps jump in Mexican long-term rates. Inflows fell moderately in the month following the recent U.S. tapering announcements (z-score of -1.65). See Appendix Table 1 for details on the above results.</li> <li>• <b>Resilience:</b> The main vulnerability lies in the large increase in foreign-held sovereign bonds. However, the banking and corporate sector seem to be well positioned in case of a sudden stop.</li> <li>• In the event of significant outflows, the economy can accommodate higher interest rates. Also, reserves can be used to limit currency overshooting. Furthermore, the Flexible Credit Line (FCL) arrangement has been an effective complement to international reserves as insurance against global tail risks. Fiscal policy has little room to expand.</li> </ul>



## Poland

Background	
<p><b>Growth</b> slowed to 1.9 percent in 2012, and is below potential. <b>Inflation</b> has fallen sharply below the lower band of the target range (1.5–3.5 percent) in 2013. <b>Monetary policy</b> began easing in November 2012. Cumulative rate cuts since then amount to 225 bps bringing the reference rate to 2½ percent. Fiscal consolidation has led to a drop in public <b>debt</b> for the first time since 2007 to 55.6 percent of GDP in 2012. Poland has been granted a two-year extension to exit the European Union’s (EU) excessive deficit procedure. <b>Fiscal space thus</b> remains limited. The <b>capital account</b> is mostly open.</p>	
Capital inflows (up to the May 2013 tapering announcements)	
<p><b>Capital inflows</b> picked up sharply in 2007 comprising mainly FDI and banking flows. Following the advent of the global financial crisis, banking inflows and FDI declined, but portfolio investment in government bonds increased significantly. In 2012, net financial inflows were at their lowest level since 2006. Net inflows (4Q rolling average) stood at US\$5.1 billion in Q4 2012, compared with a peak of US\$12.8 billion in Q2 2008.</p>	
Coping with inflows	Potential vulnerabilities
<ul style="list-style-type: none"> <li>• <b>The policy response</b> to capital inflows has been mostly passive. Monetary policy has focused on responding to movements in inflation. Sporadic intervention in the foreign exchange market has attempted to curb excessive volatility. Prudential regulations were tightened to address risk from mortgages denominated in foreign currency.</li> <li>• <b>Export</b> performance is closely linked to developments in core EU countries (particularly Germany).</li> <li>• The cyclically-adjusted <b>current account</b> improved in 2012 and appears broadly consistent with medium-term fundamentals and desirable policies. The <b>REER</b> was deemed fairly valued (IMF 2013d).</li> <li>• <b>Asset prices:</b> Growing demand from foreigners has driven government bond yields down. EMBI spreads dropped from 350 bps (end 2011) to around 100 bps (May 2013), and sovereign credit default swap (CDS) spreads dropped by about 200 bps to about 80 bps (between May 2012 and May 2013). Credit growth declined in 2012 compared to 2011, while real-estate prices have been declining.</li> <li>• The <b>banking sector</b> is largely foreign owned and appears resilient with CAR of 15¾ percent (core tier 1 ratio of 13¾ percent) at end-March 2013. Nevertheless, an overhang of FX-denominated mortgages continues to pose risks to asset quality. <b>Corporate</b> leverage (debt-to-equity ratio) has increased moderately from 42 percent in 2007 to 49 percent in 2012 with a pick-up in bond financing in 2012.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Exposure:</b> Polish long-term bond rates are historically not significantly related to U.S. monetary policy shocks, as per regression analysis. Yet, the recent jump in U.S. yields of 25 bps immediately following U.S. tapering announcements led to a contemporaneous 35 bps jump in Polish long-term rates. Inflows fell significantly in the month following the recent U.S. tapering announcements (z-score of -1.95). See Appendix Table 1 for details on the above results.</li> <li>• <b>Resilience:</b> Poland’s market is used by investors to express views on the region. Yet, it is a relatively small market and remains vulnerable to investors’ outlook on emerging markets in general. The foreign ownership share of government bonds reached a historical high of 37 percent in April 2013; the market is vulnerable to a potential reversal of investor sentiment, which could lead to sizeable outflows.</li> <li>• In the event of significant outflows, fiscal space is limited owing to public debt limits, and higher interest rates would further weigh on inflation and output, as both are below target and potential, respectively. In this scenario, the exchange rate would have to bear the brunt of the shock.</li> <li>• The vulnerability to significant outflows is mitigated by the stable nature of the investor base, prudent public debt management, and strong liquidity in the banking sector.</li> </ul>

## Russia

Background	
<p><b>Growth</b> has been above potential since early-2010, but has recently slowed to below 2 percent in the first quarter of 2013. With the inflation projections close to the target range and uncertainty about the near-term economic outlook, the <b>monetary policy</b> stance is considered appropriate, with a bias towards tightening. The non-oil <b>fiscal deficit</b> remains above the level needed to generate sufficient saving of oil revenue and build confidence. However, <b>debt</b> sustainability is not an immediate concern given low public and external debt levels—12 percent and 28 percent, respectively. The <b>capital account</b> is relatively open since financial liberalization.</p>	
Capital inflows (up to the May 2013 tapering announcements)	
<p><b>Capital inflows</b> have remained fairly stable since late 2009. Instead, Russia has experienced large capital outflows likely due to a global flight to safety. In 2012 net outflows amounted to US\$30 billion, or 1.5 percent of GDP, compared to US\$21 billion in 2010.</p>	
Coping with inflows	Potential vulnerabilities
<ul style="list-style-type: none"> <li>• There has been no <b>policy response</b> to capital inflows.</li> <li>• <b>Exports</b> decreased in 2012, after having increased in 2010–12. Between January 2009 and May 2013, the REER appreciated 16 percent due to higher inflation than in trading partners.</li> <li>• The cyclically-adjusted <b>current account</b> surplus declined from 6 percent of GDP in 2008 to 2.9 percent of GDP in 1Q 2013, reflecting moderating oil prices and growing imports. The current account appears broadly in line with medium-term fundamentals and desirable policies, while the <b>REER</b> was deemed moderately undervalued (IMF 2013d).</li> <li>• <b>Asset prices</b> have increased since 2008. 10Y government bonds decreased to just below 7 percent by May 2013, from an average of 10 percent in 2009, while equities increased by 120 percent between January 2009 and May 2013. Concerns remain about asset quality in the context of rapid credit growth and volatile oil prices.</li> <li>• The <b>banking sector</b> improved between 2009 and 2012 with higher profitability and a lower NPL ratio. Yet, this trend has slightly reversed since, and external debt has been increasing. <b>Corporate</b> leverage has remained mostly unchanged since 2008.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Exposure:</b> Russian long-term rates are historically not significantly to U.S. monetary policy shocks, based on regression results. However, the recent jump in U.S. yields of 25 bps immediately following U.S. tapering announcements led to a contemporaneous 46 bps jump in Russian long-term rates. Moreover, inflows fell moderately in the month following the recent U.S. tapering announcements (z-score of -1.69). See Appendix Table 1 for details on the above results.</li> <li>• Russia may be exposed to significant risks if commodity prices are affected by U.S. tapering.</li> <li>• <b>Resilience:</b> The depth and liquidity of the financial sector remains relatively low. However, Russia is not very dependent on foreign funding (2.3 percent of GDP).</li> <li>• Both fiscal and monetary authorities have space to operate in case significant outflows materialize.</li> </ul>

## South Africa

### Background

**Growth** has slowed to 0.9 percent in the first quarter of 2013, below its potential of 3–3½ percent and the lowest since 2009. The **current account deficit** widened to 6.3 percent of GDP in 2012, reflecting a wider trade deficit and worsening terms of trade, but has narrowed moderately in the first quarter of 2013. **Inflation** has been hovering at the top of the 3–6 percent target range. The **monetary policy** rate is at 5 percent without any cuts since July 2012, leaving the real rate slightly negative. The rand remains vulnerable to foreign investor flows and the commodity cycle. **Public debt** is over 40 percent of GDP. **Fiscal policy** is appropriately accommodative in the short run, letting automatic stabilizers work around the government’s medium-term consolidation path. Achieving the government’s debt target may require additional measures unless growth picks up beyond current projections. The **capital account** is mostly open with no capital controls on nonresidents’ transactions and gradually relaxed controls on residents’ FX transactions. The central bank is committed to a fully flexible exchange rate and has seldom intervened in the foreign exchange market.

### Capital inflows (up to the May 2013 tapering announcements)

**Capital inflows** have remained strong, largely led by **portfolio** flows towards the local debt market, though the equity market also remains an important destination. In 2012, South Africa was included in the World Government Bond Index (WGBI). Portfolio inflows recorded US\$14.4 billion in 2010, nearing pre-crisis peaks of US\$21.9 billion in 2006 and US\$13.7 billion in 2007. Nonresidents hold about 40 percent of government bonds and 30 percent of equities. Citing lackluster growth, rising vulnerabilities, and structural and social problems, all three major credit rating agencies have downgraded South Africa’s sovereign rating, and two maintain a negative outlook.

### Coping with inflows

- **The policy response** to capital inflows has been eclectic, including allowing the exchange rate to appreciate, maintaining an accommodative monetary stance, liberalizing outflow controls, and building international reserves. CFMs have been considered.
- **Exports** have remained mostly robust until 2011. Yet, the current account deficit of 6 percent is high and likely to remain elevated.
- The cyclically-adjusted **current account** is 2–4 percentage points of GDP weaker than implied by medium-term fundamentals and desirable policy settings. The **REER** is deemed to be moderately overvalued (IMF 2013d).
- **Asset prices** have risen since 2008 with sizable foreign buying of local government bonds, decreasing 10Y yields to 7 percent as of May 2013. Some of these developments have moderated or reversed since May 2013.
- The **banking sector** is mostly stable with satisfactory capital buffers, though there are some risks from the recent rapid increase in unsecured lending. **Corporate** debt has increased but remains manageable.

### Potential vulnerabilities

- **Exposure:** South African long-term rates are historically somewhat sensitive to U.S. monetary policy shocks as per regression analysis. The recent jump in U.S. yields of 25 bps immediately following U.S. tapering announcements led to a contemporaneous 23 bps jump in South African long-term rates. Inflows fell significantly in the month following the recent U.S. tapering announcements (z-score of -1.87). See Appendix Table 1 for details on the above results.
- **Resilience:** Large domestic investors have the potential to substitute foreign investors if these withdraw funding.
- Significant outflows could create a difficulty in financing the current account deficit that is increasingly reliant to non-FDI flows. Higher interest rates would further squeeze an economy that is growing below its potential. In addition, there is diminished fiscal space. Lower global commodity prices also pose a risk.

## Thailand

### Background

**Growth** rebounded sharply after the historic floods of 2011 to 6.4 percent in 2012, but then slowed significantly in the first half of 2013. Both headline and core **inflation** have declined over the course of 2013. The **monetary policy** stance seems appropriate, as of August 2013. The policy rate was lowered to a historical low of 1¼ percent in April 2009, gradually raised since July 2010 by a cumulative 2¼ percent, and then cut again by a cumulative 1 percent since November 2011 due to the weakening external environment and widespread floods. **Public debt** was 45.4 percent of GDP at end-2012, but is expected to rise. **Fiscal policy** needs to be tightened once the recovery is entrenched. Most outward capital transactions and many inward transactions are subject to ceilings above which the Bank of Thailand (BOT) approval must be obtained.

### Capital inflows (up to the May 2013 tapering announcements)

Gross capital flows to Thailand reached a historical high of US\$40 billion in 2012. The capital and financial account registered a surplus of US\$10 billion. The major contributors were net **portfolio** inflows (1.2 percent of GDP) to the **bond** market and **other investments** (2.9 percent of GDP). Gross **FDI** remains the largest form of capital inflows; however, net FDI has been negative since 2011 as a result of increased **outward FDI** by Thai firms.

### Coping with inflows

- **The policy response** to capital inflows included allowing appreciation with interventions, lowering the policy rate, and relaxing outflow controls. Macroprudential measures and CFMs are being assessed.
- **Exports** have continued to gain market share over the last decade, driven mainly by the vertical trade integration across Asian economies, despite the REER appreciation during the same period.
- The cyclically-adjusted **current account** is about 0-2 percentage points of GDP stronger than the value consistent with medium-term fundamentals and desirable policies. The **REER** was deemed to be fairly valued (IMF 2013d). Amid significant volatility, the current account surplus came down sharply from its peak in 2009 at 8¼ percent of GDP to 0.7 percent in 2012 (2 percent cyclically adjusted).
- **Asset prices** rose strongly during the capital inflow period. The Thai **stock** index increased by 275 percent between end-2008 and May 2013 (annual average growth of 35 percent). **Bond** yields declined, while the yield on 10Y government bonds has remained around 3.5 percent. Housing prices increased 3–4 percent at the national level in 2012, but by 50 percent in the last 12 months in selected areas of Bangkok. Some of these developments have moderated or reversed since May 2013.
- The **banking sector** remains sound. The NPL ratio has continued to decline, capital adequacy improved, and profitability remains strong. However, there are early signs of rising systemic risk.

### Potential vulnerabilities

- **Exposure:** Thai long-term rates are historically sensitive to a hike in U.S. long-term interest rates, based on regression results. The recent jump in U.S. yields of 25 bps immediately following U.S. tapering announcements led to a contemporaneous 20 bps jump in Thai long-term rates. Inflows fell significantly in the month following the recent U.S. tapering announcements (z-score of -2.37). See Appendix Table 1 for details on the above results.
- **Resilience:** Foreign equity holdings are high, but government debt is mostly domestically financed. High domestic market capitalization and relatively high turnover will support resilience.
- In the event of significant outflows, higher interest rates can be accommodated due to a relatively small output gap. Also, ample FX reserves can be used to limit exchange rate volatility and overshooting. The banking sector also appears sound.

## Turkey

Background	
<p><b>Growth</b> has increased to 3 percent as of 1Q 2013 after a significant slowdown in 2012, and still remains below its potential of around 4 percent. <b>Inflation</b> jumped to 8.8 percent in July 2013, and is at risk of missing the target range (3 to 7 percent) going forward. <b>Monetary policy</b> has gone through important changes in the framework that have caused distortions in the transmission channel and higher inflationary expectations. <b>Fiscal policy</b> is loose and pro-cyclical; however, public debt stands only at 35 percent of GDP. <b>External debt</b>, while sustainable, is increasing and vulnerable to a large exchange rate shock. The <b>capital account</b> is mostly open.</p>	
Capital inflows (up to the May 2013 tapering announcements)	
<p><b>Capital inflows</b> have been substantial since 2008. In 2012 gross inflows amounted to US\$70 billion (9 percent of GDP), similar to the pre-crisis peak. These have financed the current account deficit and increased reserves by more than US\$30 billion in 2012. Inflows towards FDI have declined; while those toward <b>debt</b> have increased making Turkey more exposed to a sudden stop. Despite improvements in the maturity composition, short-term debt remains the predominant financing instrument.</p>	
Coping with inflows	Potential vulnerabilities
<ul style="list-style-type: none"> <li>• <b>The policy response</b> to capital inflows has seen monetary policy take on an additional objective of financial stability and adopt several unorthodox tools including reserve requirement ratios, various repo facilities, FX interventions, as well as macroprudential measures. These were used at different times to contain lending and avoid exchange rate volatility.</li> <li>• <b>Exports</b> have somewhat increased since 2008, but so have <b>imports</b>. The REER appreciated by 4 percent on average in 2012.</li> <li>• The cyclically-adjusted <b>current account</b> is 1.5-3 percent of GDP weaker than the level implied by medium-term fundamentals and desirable policies. The REER was deemed moderately overvalued (IMF 2013d).</li> <li>• <b>Asset prices</b> have increased since 2008. 10Y government bonds decreased to around 6 percent by May 2013, and equity prices increased by 16 percent annually since 2009 (with a strong correction after May 2013). Credit growth has gone through large swings since 2008 and has picked up again over 2013, as of August 2013.</li> <li>• The <b>banking</b> and <b>corporate sectors</b> are mostly stable with satisfactory capital buffers, however external funding is dominated by short-term debt. <b>Corporate</b> leverage has risen but remains manageable.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Exposure:</b> Turkish long-term rates are historically highly sensitive to U.S. monetary policy shocks, based on regression results. The recent jump in U.S. yields of 25 bps immediately following U.S. tapering announcements led to a contemporaneous 95 bps jump in Turkish long-term rates. Still, inflows fell moderately in the month following the recent U.S. tapering announcements (z-score of -1.48). See Appendix Table 1 for details on the above results.</li> <li>• <b>Resilience:</b> Turkey's large external financing needs and relatively small markets make it vulnerable to external shocks.</li> <li>• In the event of significant outflows, higher interest rates could further weigh on an economy growing somewhat below potential. However, the exchange rate has room to adjust, and FX reserve could support interventions to prevent overshooting and mitigate volatility. Moreover, some fiscal policy space remains.</li> </ul>

## CAPITAL FLOWS AND FINANCIAL VULNERABILITY IN A MODEL OF MACROFINANCIAL RISK AND MACROECONOMIC STRESS<sup>4</sup>

**6. The impact of capital flows and their reversals on the financial sector and the real economy can be nonlinear.** Depending on the extent of the risks in the balance sheets of lenders and borrowers, a large-enough adverse shock can force the economy out of a *corridor of stability* (where standard adjustment mechanisms make for a smooth and predictable return to the normal) into a region where global nonlinearities and asymmetries rapidly take over.

**7. Standard macroeconomic models, by construction, are not capable of dealing with macrofinancial stress scenarios.** These models typically overlook two sources of instability. First, they ignore the existence of endogenous aggregate (non-diversifiable) risks on the balance sheets of financial institutions and borrowers. Second, they are routinely solved by local approximation methods (such as linearization or higher-order approximation), and hence cannot provide any insights into global nonlinearities arising from such balance-sheet risks. Arguably, such models can only explain macroeconomic behavior within the corridors of stability; and attempts to extrapolate local dynamics to the regions of large distress inevitably result in an overly benign picture.

**8. IMF staff has therefore developed a new type of model allowing for global nonlinear feedback in scenarios of large distress.** The novelty lies in integrating several macrofinancial amplification mechanisms within a broader macroeconomic framework. The model endogenizes and interconnects the notions of aggregate credit risk, loan portfolio value of banks, bank capital buffers, and relative costs of internal and external equity flows. The output of the model is primarily illustrative; patterns are more telling than the exact numerical values of series. The model first and foremost provides a coherent analysis and understanding of the mechanisms at the heart of tail risk events and large distress episodes, and can help to guide the design of robust policies.

### A. Brief Description of the Model

**9. The model combines relatively standard macroeconomic assumptions based on optimizing behavior with two concepts from the finance and banking literature.** The first is the existence of aggregate, non-diversifiable credit risk on the loan books of banks, with the risk dynamics derived endogenously from macroeconomic developments. The second is the optimal choice of bank balance sheets and capital buffers under uncertainty, constrained by the risk-bearing capacity of bank capital.

**10. The real side of the model represents a small open economy in standard fashion, with production goods for local consumption and exports.** The model can be parameterized to

<sup>4</sup>Prepared by Jaromir Benes (RES).

represent a variety of different types of open economies. The model distinguishes between the short-run and long-run elasticity of substitution in expenditure switching, and allows for different degrees of import substitution, as well as weights on permanent and current income in determining aggregate demand.

- 11. The financial sector consists of banks.** Banks extend non-traded bank loans, and create matching liabilities in the form of bank deposits. They are also required to hold capital. The model distinguishes between *saving* and *financing*. Bank deposits, created at the moment of extending a new loan (as in the real world), are used to finance consumption, investment, and purchases of imports, or are accepted to finance nonresidents' purchases of local exports.
- 12. Individual bank loans and overall loan portfolios are both risky.** Debtors can default on their loans depending on the evolution of their income and wealth. The risks of individual loans are correlated: loans share a common, systemic component, determined by aggregate macroeconomic developments, ex-ante unpredictable. As a result, banks are able to diversify some risk (by extending loans to a large number of borrowers) but not all risks. Specifically, bank loan portfolios remain exposed to aggregate risk.
- 13. Lending is constrained by regulatory capital buffers.** Given the amount of capital, banks optimize the size of their balance sheets by expanding or reducing their loan portfolios (and the amount of the matching bank deposits). Because of the existence of non-diversifiable risk, banks choose to hold capital in excess of regulatory requirements to minimize the cost of possible capital shortfalls in the future. The buffers vary endogenously over time in a pro-cyclical fashion, as they depend on the riskiness of the loans which in turn depend on the income and wealth of borrowers.
- 14. The banking sector adds a critical feedback mechanism to the model.** Unforeseen adverse shocks cause a rise in impaired loans, and subsequent write-downs. Thinner capital buffers induce banks to liquidate some of their assets and increase the price of bank lending, triggering a vicious circle of fire sales and credit crunches.
- 15. The feedback mechanism is nonlinear and asymmetric.** In exceptionally good times, the marginal positive impact of bank finance on the real economy decreases. This is because banks are virtually sellers of call options, with limited upsides (the maximum banks can make on a loan portfolio is limited by the non-contingent lending rates). In exceptionally bad times, however, the downside is practically unlimited. Sizeable adverse shocks hit the performance of loans granted not only to marginal borrowers, but also to all legacy borrowers. The resulting losses thus grow rapidly.
- 16. The real sector of the model is calibrated on a small open economy to broadly match the characteristics of emerging Central and Eastern European countries.** Parameterizing the macro-financial linkages is less straightforward. Since responses to shocks and external scenarios are not additive in globally nonlinear models, a much larger (by several orders of magnitude) number of simulations and parameter combinations would have to be examined to achieve the same confidence as when calibrating regular business cycle models. In addition, there is little data relative

to periods of nonlinear financial distress to draw upon. Thus, as discussed earlier, quantitative predictions of nonlinear models should not be taken literally.

## B. Design of Simulation Experiments

**17. Simulations seek to capture a sustained period of capital inflows followed by a sudden reversal.** An initial period of three years of cheap foreign (nonresident) finance<sup>5</sup> and capital inflows (Phase I, blue background in the charts) is followed by a sudden and unexpected reversal of capital flows (Phase II, white background in the charts). After the reversal, the economy gradually returns to its normal state. The simulations are designed as *stress scenarios* (that is, low-probability though still plausible scenarios with large adverse impact on the economy). They do not represent the most likely baseline projections or forecasts.

**18. Phase I is set up as a prolonged period of low foreign financing costs.** The cost of foreign financing falls by 200 bps. Note that the exact reason for such a decrease in the cost is largely irrelevant from the point of view of the domestic economy. In the real world, the drop represents the lower interest rates that followed UMP in AEs.

**19. During Phase I, banks and borrowers do not internalize the risk of a reversal.** All agents behave as if the low cost of foreign financing were going to continue indefinitely. This myopia gives rise to an externality; and the risk associated with bank lending is underpriced.

**20. Phase II sees first a rapid increase in the cost of foreign financing, and then a gradual return to normal.** The cost of foreign financing increases initially by 300 bps (thus overshooting the normal level by 100 bps), and then converges back to normal within about five years.

**21. Four different scenarios are simulated to provide a full account of the nonlinearities arising in response to macrofinancial vulnerabilities.** The model considers two different economies: one is a “resilient” economy because of a very limited proportion of foreign currency loans (5 percent); the other is a potentially more “vulnerable” economy with a much higher proportion of bank loans in foreign currency (50 percent). For each economy, two simulations are run: the first with a linearized version of the model, and the second using a global nonlinear solution. Conventional linearized models will somewhat overestimate the upside during good times, and greatly underestimated the downside during bad times.

**22. Throughout the simulations, no pro-active policies in response to the build-up of macrofinancial risks are considered.** Although the model allows for several types of countercyclical macroprudential policies (such as capital surcharges), the simulations assume that policy remains passive.

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<sup>5</sup>The term “foreign finance” is used in reference to the residency principle in the description of the simulations, whereas the terms “foreign currency” or “FX” are used in reference to the currency principle.



**23. Finally, the share of FX loans is given parametrically, and the choice of currency is not endogenous in the model.** There are various reasons why some economies experience FX lending while others rely more on local currency lending. On the demand side, the reasons relate to the credibility of monetary and other policies, the existence of risk spreads, and to myopia in assessing future exchange rate risks. On the supply side, decisions can be affected by the prudential regulation on FX lending.

### C. Phase I—Capital Inflows

**24. The lower cost of finance, followed by an appreciation of the domestic currency and a rise in asset prices, results in faster credit growth.** Domestic households and firms use the additional purchasing power to increase their demand for local goods, imports, and assets (such as housing, productive capital, stocks). As a result, real economic activity experiences a boom. Import demand in particular is strong, owing to the exchange rate appreciation. The current account thus deteriorates, while net foreign liabilities increase.

**25. The upturn in credit and real economic activity is amplified in an economy with a higher proportion of foreign exchange loans.** The exchange rate appreciation further improves the borrowing capacity of households and firms (by reducing the loan-to-value or debt-to-income ratios). At the same time, the risk of future defaults in the event of a large depreciation also grows, but is not fully internalized by banks and borrowers.

**26. The capital adequacy ratios of banks decline over time.** Banks choose to hold thinner regulatory capital buffers, as they perceive lending to be safer as the wealth of borrowers increases. This poses the classical problem of pro-cyclical capital requirements.

**27. In both economies, the linearized simulations over-predict the upturn.** Nevertheless, the differences look relatively innocuous compared with those observed after a reversal, in Phase II. Note that capital adequacy ratios are not reported for the linearized simulations since credit risk, the main determinant of capital ratios, does not exhibit first-order dynamics in the model.

### D. Phase II—Turning of the Cycle and Capital Outflows

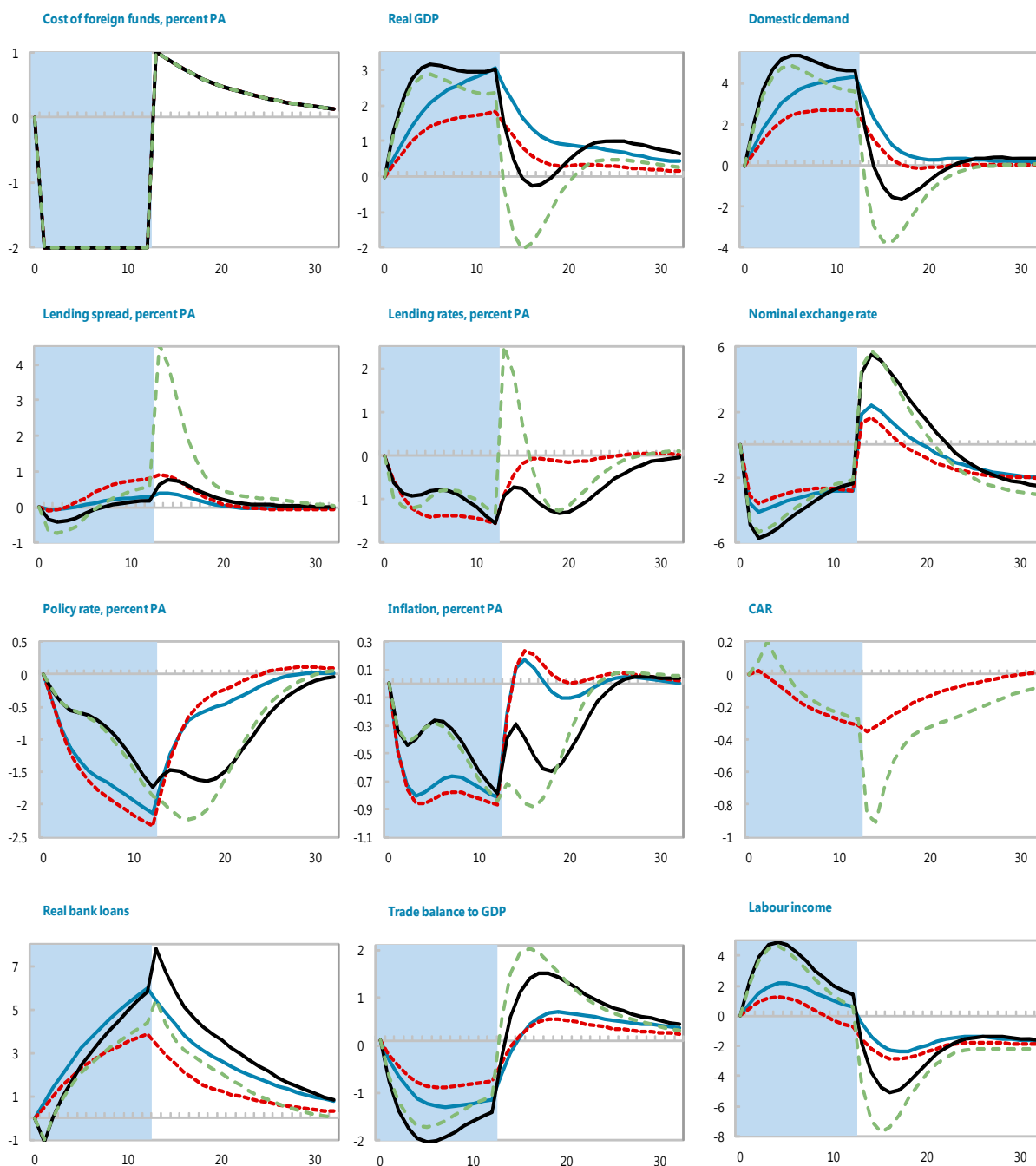
**28. The unanticipated increase in the cost of foreign financing, and the reversal in capital flows, reduces the sustainable level of the economy's debt.** Both types of economies (regardless of the share of foreign currency loans) must undergo current account adjustments. The current account adjustments are achieved by reductions in consumption and investment (and hence demand for imports), and by improvements in real exports facilitated by the sudden depreciation of the exchange rate.

**29. Households' and firms' access to bank credit deteriorates rapidly, driven by the currency depreciation and fall in asset prices.** At the same time, the currency depreciation lowers the real income of households, with pass-through to wages assumed to be more sluggish. These two factors undermine aggregate demand.

**30. In the economy with high foreign currency lending, the impact is considerably magnified by valuation effects.** The amount of outstanding bank credit *expressed in local currency* reaches very high levels, as the valuation effect of exchange rate depreciation outweighs an actual drop in the *effective* volume of bank lending.

**31. Nonlinear feedback mechanisms between real and financial variables amplify the effects of the shock.** The simultaneous depreciation of the currency and fall in asset prices results in sharp increases in non-performing loans. As banks write-off the unexpected losses on their loan books, capital buffers deteriorate. The effect is negligible in the case of the resilient (low FX) economy, yet large for the vulnerable (high FX) economy in which capital buffers drop by as much as 1 percentage point. Banks cut back lending in order to recapitalize. Banks also raise the price of bank credit (lending spreads), and, simultaneously tighten lending conditions (effectively rationing credit). The first is especially important to increase profit margins and thus rebuild capital. The fall in credit triggers a vicious circle and further depresses demand, depreciates the currency and undermines asset prices. In turn, these developments raise non-performing loans, further fueling the process.

**Figure 3. Model-Based Simulation Experiments**



Source: Fund staff estimates.

Legend:

- Linearized simulation of the scenario with a low share (5 percent) of foreign-currency loans.
- - - Nonlinear simulation of the scenario with a low share (5 percent) of foreign-currency loans.
- Linearized simulation of the scenario with a high share (50 percent) of foreign-currency loans.
- - - Nonlinear simulation of the scenario with a high share (50 percent) of foreign-currency loans.

## EFFECTS OF UMP ON BOND AND EQUITY FLOWS AND PRICES<sup>6</sup>

***This section provides new evidence on the effects of UMP on flows into and out of country bond and equity mutual funds, as well as the impact on bond yields, and equity prices.*** A range of techniques provides a relatively holistic picture of the likely effects of UMP, including: (1) factor analysis of the role of global, regional, and country factors in driving weekly flows in and out of country mutual funds; (2) regressions to see how these weekly flows relate to purchases of assets by the U.S. Federal Reserve (FED), Bank of England (BoE), European Central Bank (ECB), and Bank of Japan (BoJ) as well as UMP announcements; (3) regressions to analyze the extent to which weekly portfolio flows affect asset prices; and (4) event studies on daily asset prices to assess if forward guidance announcements had an additional impact on asset prices independent of asset purchase announcements.

***The results underline that looking at announcements of UMP provides only part of the overall impact of these policies.*** In particular, mutual fund flows are generally found to respond more to actual UMP bond purchases than to UMP announcements. Furthermore, the pattern of flows varies by UMP program in an intuitive manner given market conditions.

- *When the Fed used mortgage backed securities (MBS) and Treasury purchases to stabilize markets the results find that money initially flowed out from global markets and then into advanced markets.*
- *By contrast, the most recent program of asset purchases (U.S. Large Scale Asset Purchase 3 (LSAP3)), which has been undertaken at a time when market conditions have been more stable, initially resulted in a synchronized flow into emerging markets bonds and non-U.S. equity funds.*
- *The Fed's May 22 tapering announcement is associated with a generalized repricing of risk, inducing a notable increase in the level of correlation of flows—especially EM bond flows—as U.S. LSAP3 and Japanese LSAP flows were partly reversed.*

***Mutual fund flows do appear to significantly affect asset prices.*** The evidence is clearest with respect to equities, while similar relations seem to hold in other asset markets.

***Finally, forward guidance announcements do seem to have had a separate impact from announcements of asset purchases.*** The surprise effect of central banks' announcements embedding forward guidance has a strong impact on stock prices and foreign currencies.

***Three general conclusions are: different forms of UMP operate through different mechanisms,*** with purchases of assets mattering for flows and likely asset prices in addition to announcement effects; ***the impact of UMP policies also varied with market conditions,*** with the boost to domestic markets per dollar of asset purchases likely falling as leakage to the rest of the world rose; and that ***the size of the global component in EM bond flows implies this market may be a particularly important potential source of global risk.***

<sup>6</sup>Prepared by Tamim Bayoumi, Qianying Chen, Cristina Costantinescu, and Silvia Sgherri (all SPR).

## A. Common Dynamics of Bond and Equity Funds Flows across the Globe: Risk-on/Risk-off Movements and Changes in Cross-correlations

**32. This section uses factor analysis to look at the role of common factors in explaining flows into and out of bond and equity market mutual funds and exchange-traded funds (ETFs).** The common dynamic properties of equity and bond flows across a large pool of advanced and emerging markets are used to assess: (i) the extent to which mutual funds flows have been driven by global risk-on/risk-off movements in financial markets; (ii) whether the share of volatility in funds flows associated to such global factors has changed over time; and (iii) whether—time-wise—there is any relation between shifts in the share of volatility in bond and equity funds flows due to global factors and the implementation of UMP.

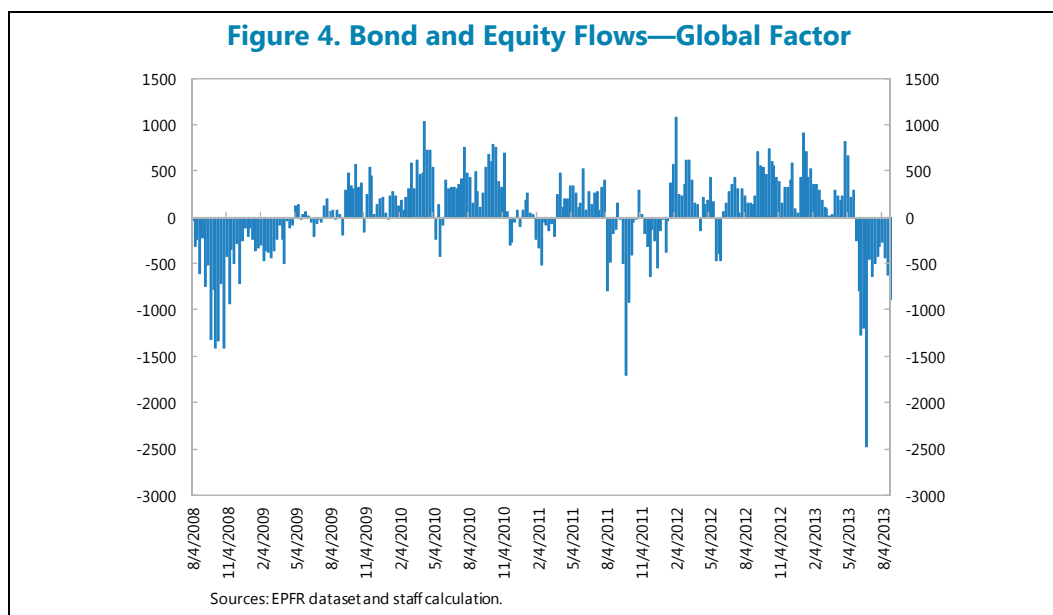
**33. A Bayesian dynamic latent factor model was used to estimate common dynamic components** in two different kinds of portfolio flows (bonds and equities) in our 42-country sample which have been divided in nine groups of countries having similar characteristics (called “regions”).<sup>7</sup> In this way, it simultaneously estimates (i) a dynamic factor common to all aggregates, regions, and countries (the global factor); (ii) a set of nine regional dynamic factors common across aggregates within such a region; (iii) 42 country factors to capture dynamic comovements across the net flows of the two asset markets within each country; and (iv) a component for each asset market that captures idiosyncratic dynamics. By design, the dynamic factors capture all intertemporal cross-correlation among the observable variables.<sup>8</sup>

**34. The study relies on the EPFR Global dataset.** The EPFR Global database contains weekly portfolio investment (net) flows by more than 14,000 (mutual and ETF) equity funds and more than 7,000 (mutual and ETF) bond funds, with US\$8 trillion of capital under management. Although this represents only less than 20 percent of the market capitalization in equity and in bonds for most countries, generally with a lower proportion for bonds compared to equities, EPFR data can be deemed as a fairly representative sample of global flows, closely matching portfolio flows stemming from BOP data (Jotikasthira and others, 2012). More details on the features of the dataset are also provided in Fratzscher and others (2013). A key strength of the data is the high (weekly) frequency of reported flows and its broad geographic coverage, for both AEs and EMEs. In the study, we use

<sup>7</sup>Advanced markets comprise Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hong Kong, Ireland, Israel, Italy, Japan, Korea, Netherlands, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, the United Kingdom (U.K.), and the U.S. Emerging markets comprise Argentina, Brazil, China, Colombia, Egypt, Hungary, India, Indonesia, Malaysia, Mexico, Philippines, Poland, Russia, South Africa, Thailand, Turkey, and Ukraine. Countries are grouped into 9 regions. G3 comprises Japan, U.K., and U.S. Core EA comprises: Austria, Belgium, Finland, France, Germany, and Netherlands; Periphery EA comprises: Greece, Ireland, Italy, Spain, and Portugal. Advanced Financial comprise Denmark, Hong Kong, Singapore and Switzerland. Advanced Commodity Exporters comprise Australia, Canada, Norway, and Sweden. Latin America comprises Argentina, Brazil, Colombia and Mexico. Asia comprises China, India, Indonesia, Malaysia, South Korea, Philippines, and Thailand. Europe comprises Czech Republic, Hungary, Poland, Russia and Ukraine. Others comprise Egypt, Israel, South Africa, and Turkey.

<sup>8</sup>Details on the Bayesian methodology employed for the estimate are provided in Kose, Otrok, and Whiteman (2003).

data for 25 AEs and 17 EMEs, over the period from January 1, 2007 to August 26, 2013. The EPFR data by country were adjusted for the increasing coverage of funds over time which, in aggregate, almost halves the amount observed bond and equity flows by the end of the sample compared to the raw data, with very similar rate of shrinkage for advanced and emerging markets.

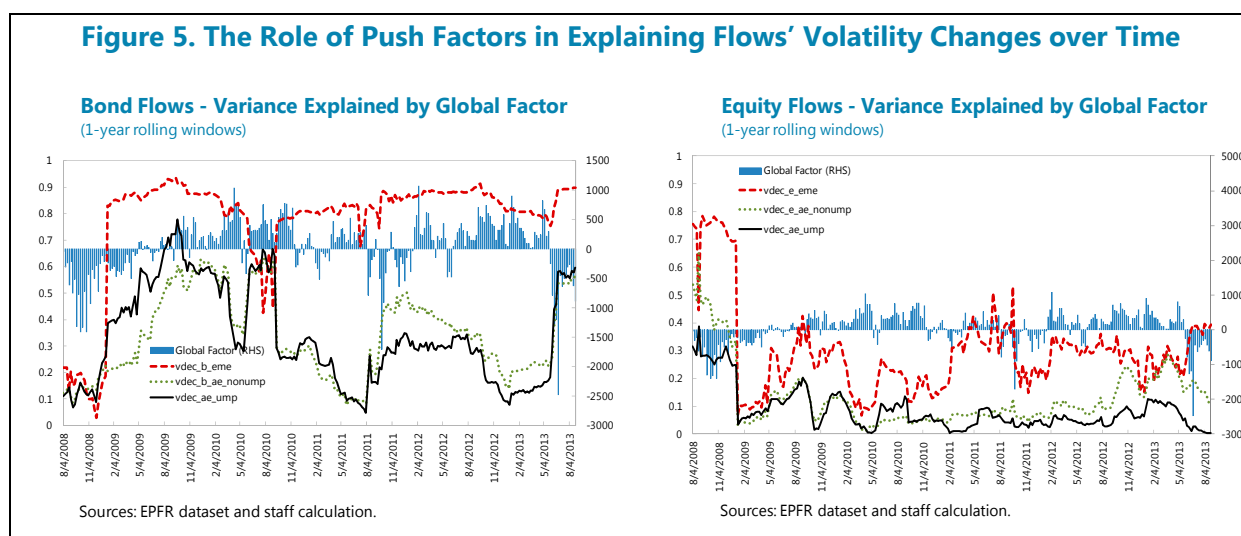


**35. Common dynamics of bond and equity funds flows across a large pool of advanced and emerging markets point to synchronized outflows following the Fed’s tapering announcement on May 22, 2013.** Figure 4 presents the mean of the posterior distribution of the global component in equity and bond flows. Fluctuations in this global factor are likely to reflect global risk-on/risk-off movements in financial markets and global liquidity conditions, with persistent and synchronized outflows from the beginning of the crisis (August 2007) until mid-2009; significant synchronization of outflows between August 2011 to February 2012—at the peak of the euro area debt crisis; and, strikingly, a record large global outflow following the Fed’s tapering announcement on May 22, 2013, possibly reflecting increased international participation in local bond markets over time.

**36. More generally, the sources of volatility in bonds and equity funds flows have been varying over time, across asset classes, and across countries.**<sup>9</sup> Figure 5 reports the proportion of weekly portfolio flows explained by the global factor for three groups of countries: emerging

<sup>9</sup>To measure the relative contributions of the world, region, and country factors to variations in portfolio flows in each country, we estimate the share of the variance of net flows in each asset market that is due to each of the three factors (world, region, country-specific). What is left represents the share of the variance due to the idiosyncratic component characterizing each country-specific bond and equity flow, respectively.

markets (red line); the four major users of UMP (the U.S., euro area, Japan, and the U.K., green line); and non-UMP advanced markets (black line). Equity markets showed much more coherence than bond markets in the early days of the crisis, with the global factor explaining 30–80 percent of equity flows versus 10–20 percent of bond flows. This pattern switched abruptly with the launch of the Fed’s QE1, in November 2008. Since then, the global factor has explained a surprisingly consistent 80 percent of the variation in EMEs bond flows. The proportion for advanced economies is lower and varies more with the ebb and flow of the crisis—rising, for example, in the summer of 2011 as euro area concerns increased. A similar ebb and flow, although with somewhat different triggers, is true of equity flows after QE1, with the global factor explaining more of EME equity flows than those of advanced countries. In short, emerging market bonds were at the center of “risk-on/risk-off” behavior.



**37. Since May 22, the role of global factors in explaining variations of portfolio flows seems to have jumped, pointing to a generalized repricing of risk** (Figure 5). This suggests that the increase in market volatility following the recent Fed’s tapering announcements are less due to idiosyncratic EME weakness, but rather are primarily driven by push factors which are common to EMEs and non-UMP AEs alike. Table 2 provides a more granular idea of the portfolio rebalancing occurred over the period May 22 to August 26 and, most importantly, the share of the actual flows which is due to the estimated global factor—virtually 100 percent for bond flows. Overall, following the tapering announcement, we saw flows out of EMEs and AEs bond funds and primarily into U.S. equity funds. For EMEs bond funds, we estimate outflows for US\$10 billion (approximately 0.2 percent of EMEs bond market size). For AEs bond funds, we estimate outflows for US\$11 billion (approx. 0.1 percent of AE bond market size), with US\$7.6 billion representing U.S. bond funds alone. For equity funds, we saw outflows from EMEs for circa US\$20 billion, US\$16 billion of which flowing into U.S. equity funds and the rest into Japanese and European equity funds.

**38. While the ratios to market size are low, it should be recalled that mutual fund flows represent only less than 20 percent of the overall portfolio flows into the economy.** This

suggests a large switch in portfolios, particularly for bond markets where the EPF data covers a smaller proportion of overall flows.

## B. The Role of UMP Announcements and Actual Central Banks' Asset Purchases in Driving Bond and Equity Funds Flows

**39. To date, the main approach to looking at the impact of UMP policies has been to use event studies to examine the impact of announcements on U.S. and foreign asset prices at high frequencies (e.g., daily or less).** While useful, such an approach has inevitable limitations. In particular, it can only look at the effect of initial announcements, which is particularly unfortunate for a policy that partly works through actual purchases of bonds. Following Fratzscher and others (2013), this section uses a similar econometric approach to event studies—looking at the synchronization between UMP policies and flows into bond and equity fund flows that week or the following one—but broadens the analysis to look at the impact of announcements and of actual purchases.

**40. Weekly data ending on Wednesdays were collected for flows into bond and equity mutual funds from the EPFR data set and on asset purchases from S4 central banks' balance sheets.** The EPFR data by country were adjusted for the increasing coverage of funds over time (as discussed in section A). Daily data on other asset price variables were also converted to weekly changes ending on Wednesday (e.g., commodity prices, VIX, etc.).

**41. Given these data, the sample was divided into periods covering distinct central banks' operations.** These were the Fed's announcements and purchases for LSAP1A (MBS purchases), LSAP1B (Treasury purchases), LSAP2, Operation Twist, LSAP3, and tapering speech on May 22, 2013; BoE's announcements and asset purchases for LSAP1, LSAP2 and FLS; ECB's announcements on outright monetary transactions (OMT) and 'whatever it takes' speech, as well as the conventional rate cut on May 2, 2013; ECB's actual long term refinancing operation (LTRO) liquidity provision and securities market program (SMP) purchases; BOJ's announcements and asset purchases for LSAP and QQME as well as pre-LSAP asset purchases. More information on the timing of these announcements and programs is given in Appendix Table 2 (reproduced from IMF 2013a).

**42. Adjusted EPFR flows seem to be a reasonable proxy for gross international bond to emerging markets and equity flows to all economies except but large money centers.** Table 3 reports the correlation of EPFR weekly data on flows into bond and into equity funds aggregated into quarters with the corresponding flows from the balance of payments since 2008Q1 as well as a measure of the proportion of balance of payment flows represented.<sup>10</sup> For emerging markets the correlations for both bond and equity markets are generally around 0.5, suggesting a reasonable correspondence between the two series. The correlations are also generally fairly high for advanced

<sup>10</sup>We used the ratio of standard errors as the two series may have quite different average flows, hence the volatility seems like a better measure of relative size of flows.



market equity flows, although this is not true for money centers such as the U.S., U.K. and Switzerland.

**43. With only a few exceptions, however, the correlations are low for AE bond flows. In interpreting these results several factors should be considered.** First, most AEs have deeper financial markets where domestic bonds are often used as collateral, which may distort the balance of payment data for bond flows. In addition, recall that these data reflect all flows to bond and equity funds, regardless of the domicile of the investor. Hence, the data can reflect the behavior of domestic investors. Certainly, this seems to be true for the U.S. where EPFR flows represent an implausibly large 64 percent of foreign equity inflows and 19 percent of foreign bond inflows. As will be discussed below, these flows seem to affect corresponding asset prices in all economies, suggesting that they reflect useful information about market behavior. Overall, we conclude that these data reflect a reasonable proxy of domestic market conditions in bond and equity markets.

**44. The basic empirical approach relates weekly flows into bond and equity mutual funds with UMP policy announcements, central banks' asset purchase programs, and other conditioning variables.**<sup>11</sup> More specifically:

$$\text{Flow}_{it} = \alpha_i + \beta_i \text{Announce}_t + \gamma_i \text{Purchase}_t + \eta_i \text{conditioning variables}_t + \varepsilon_{it} \quad (1)$$

where  $\text{Flow}_{it}$  is the flow of funds into bond/equity mutual funds for country  $i$  at time  $t$ ,  $\alpha_i$  is a country-specific constant term,  $\text{Announce}_t$  are 0/1 dummy variables for weeks with major UMP announcements,  $\text{Purchase}_t$  is the amount of securities purchased by a central bank in week  $t$ , and  $\varepsilon_{it}$  is an error term.<sup>12</sup>

**45. In addition to this baseline specification, two other variations were estimated that test for simultaneity bias.** The first variation uses lags all of the right hand side variables to ensure that purchases are not being affected by contemporaneous flows into bond and equity funds. This specification produced extremely similar results to the base case, suggesting that reverse causality is not a major issue. The second specification replaces actual weekly purchases each week with dummies that are one during the period each purchase program is active and zero at other times, hence eliminating any feedback between market conditions and the exact sums bought in programs.<sup>13</sup> This specification gave similar results in terms of coefficient significance, albeit with some differences in terms of the size of implied flows.

<sup>11</sup>The VIX is a measure of global risk aversion as well as oil and non-oil commodity prices. Data on local CDS were also collected, but not used in the final specification because of concerns about endogeneity.

<sup>12</sup>We also experimented with measures of monetary "surprises" on announcement weeks, measured using the change in the 1-year forward 3-month LIBOR rate, but the results were less satisfactory, likely reflecting the lack of granularity of weekly data (see IMF, 2013, for more discussion of the measure of monetary surprises).

<sup>13</sup>These dummies were constructed only for U.S. programs, since timing and amounts to be purchased were better specified than in other countries' purchase programs.

**46. While reverse causality does not appear to be a major issue in the regressions, the results do seem to reflect the impact of overall market conditions as well as UMP policies.**

While the conditioning variables—the VIX, oil prices, and non-oil prices—help to explain some of the volatility in EPFR fund flows, it is equally clear that the fact the Fed purchases of asset backed securities in the U.S. LSAP1A program were associated with strong outflows for bonds funds largely reflects market turmoil. Two observations are relevant here. First, the associations documented in these regressions remain important in charting the path of UMP. Second, bond and equity fund flows are more likely to be directly associated with programs initiated during periods of relative market calm, such as U.S. LSAP3.

**47. The U.K., euro area, and Japan programs were excluded from some regions where their effects were assumed to be small.** In some cases, results for these programs gave implausibly large estimated flows given the limited links between the source country and the recipient, likely reflecting the impact of market conditions discussed above. This was particularly true for fund flows to the U.S. and Canada. In addition, Latin American emerging market regressions excluded U.K. and Japan programs, while Japan programs were also excluded from European countries.

**48. Tables 4 and 5 report the coefficient estimates for the baseline specification.** Shaded coefficients are significant at the one percent level (dark blue), five percent levels (medium blue), and ten percent level (light blue). Insignificant coefficients are marked in gray. The results reveal some interesting differences in the impact of different programs. For bond flows, for U.S. LSAP1A, U.S. tapering, and Japan LSAP both the announcement and actual purchases had large numbers of significant coefficients, while purchases seems to have been the driving force for U.S. LSAP1B, U.S. LSAP2, U.S. LAP3, U.K. FLS and euro area LTRO liquidity programs. Other initiatives attract smaller numbers of significant coefficients. In addition, as might be expected since UMP asset purchases mainly involved bonds, the number of significant coefficients is generally higher for bond flows than equity flows.

**49. Tables 6 and 7 measure the overall impacts of announcements and purchases for UMP programs using the baseline specification.** For each program, the overall impact was calculated as the sum of the cumulative impact on bond or equity fund flows from any announcements and actual purchases whose coefficients are significant at the ten percent level.<sup>14</sup> The EPFR data are converted into equivalent balance of payments flows in dollars using the ratios between EPFR flows and balance of payments data reported in Table 2. In addition to dollars, the sum of lows is reported as a ratio of 2012 GDP to get a sense of UMP-related as a proportion of the size of the economy.

**50. Before discussing the results in detail, three overall conclusions may be worth emphasizing.** In the cases where UMP programs had a statistically significant effect on flows: (i) UMP-linked capital flows also play a significant role in overall bond flows—generally representing

<sup>14</sup>Clearly, for example, the ECB “whatever it takes” speech has no purchases associated with it, while pre-LSAP Japan asset purchases have no announcement within the time frame we are considering.

a good proportion of flows into U.S. and other country mutual funds; (ii) flows are often dominated by the impact of actual purchases, suggesting that analysis of UMP policies needs to take account of both announcement effects and the impact of actual purchases; and (iii) such analysis is best done by looking at individual programs rather than looking at the impact of UMP as a whole as the coefficients vary significantly by program—on occasion even changing sign—which corresponds to the intuition that both the purposes of the intervention and market conditions matter.

**51. Overall, UMP seems to have been linked with significant net inflows in bond and, to a lesser extent, equity funds.** These are often estimated to amount to several percentage points GDP. The results also tell an interesting story about the different effects of the UMP programs.

- For U.S. LSAP1, the results suggest that the net impact of MBS purchases and of the initial round of Treasury purchases (“QE1”) led to outflows from emerging market bond funds into advanced country funds. This occurred in two phases. Initially, there were generalized bond outflows from a wide range of markets during MBS purchases, (U.S. LSAP1A) followed during the (time-wise partly overlapping) Treasury purchases (U.S. LSAP1B) by bond inflows almost entirely to advanced markets. This is consistent with the view that Fed actions succeeded in stabilizing core markets. The impact on global equity flows was smaller, but again involved outflows from emerging markets to advanced economies.
- The impact of U.S. LSAP2 was mainly within advanced economies, with outflows from U.S. bond funds to U.S. equities as well other advanced bond and equity markets.
- U.S. LSAP3 led to inflows into bonds of emerging markets and some riskier advanced economies as well as non-U.S. equities.
- The impact on domestic markets per dollar of purchases appears to have fallen over time. While U.S. LSAP1B created net private sector inflows to U.S. bond markets thereby boosting the impact per dollar of assets bought, U.S. LSAP2 and LSAP3 in particular seems to have been associated with outflows to the rest of the world thereby diminishing the impact on U.S. markets per dollar of assets purchased.
- The Fed tapering announcement on May 22 induced large and generalized outflows from both emerging and advanced bond and equity funds. These flows significantly reversed earlier inflows associated with U.S. LSAP3.
- BoJ policies seem to have supported domestic bond (LSAP) and equity (QQME) markets while LSAP was also associated with major inflows into Asian bond funds.
- ECB and BoE programs are found to have limited effects on global bond flows, with the exception of U.K. LSAP1, which supported U.K. bond and global bond and equity flows.

- The net impact of recent policies on emerging markets remains uncertain. While inflows from U.S. LSAP3 were largely reversed by tapering, the inflows associated with Japan LSAP do not appear to have been reversed.

### C. The Impact of Weekly Flows on Weekly Asset Prices

**52. This section investigates whether these flows affect asset prices?** To answer this question, we first look into the impact of weekly EPFR bond and equity funds flows on weekly changes in asset prices. More precisely, we ran the following regression:

$$\Delta \text{Asset price}_{it} = \alpha_i + \beta_i \text{Flow}_t + \gamma_i \Delta \text{Asset price}_{it-1} + \eta_i \text{conditioning variables}_t + \varepsilon_{it} \quad (2)$$

Asset Prices reflect either local bond yields or equity yields and flows the corresponding EFP flows (to bonds or equities) and all other variables correspond to those in equation (1).

**53. Tables 8–9 report the impact of flows into mutual bond funds on bond yields and the impact of flows into equity funds on equity prices.** It also reports the coefficients on the change in the VIX, oil prices, and non-oil commodity prices as well as the lagged value dependent variable. The significance of these coefficients is indicated in the following column by color code, with dark/medium/light blue indicating that the coefficient is significant at the 1/5/10 percent level, and gray indicating the coefficient is insignificant at the 10 percent level.

**54. Results strongly support the view that greater inflows into funds are associated with higher asset prices.** The evidence is clearest with respect to equities, where retail investors play a more important role. The coefficients are universally correctly signed and generally highly significant. The results for bond flows are less striking in terms of significance—about a third of the coefficients are significant at the 10 percent level—but are overwhelming correctly signed. Only five of the 33 coefficients were incorrectly signed—an event which would occur randomly with a probability of less than current 0.01 percent. In short, there is strong evidence that flows into bond and equity funds are associated with changes in asset prices. Clearly, such a link does not establish causality, but the major role played by global factors in determining mutual fund bond flows may go some way to alleviating endogeneity concerns.

**55. There is also strong evidence that fund flows associated with UMP policies support asset prices.** The first experiment we ran was to add weekly asset flows associated with UMP policies, defined using the same approach as in Tables 6 and 7 (i.e. a weekly series summing the impact of program announcements and purchases with significant coefficients) to the base regression to see if UMP-related fund flows had the same effect on asset prices as other fund flows. The results (not reported for the sake of brevity) suggest UMP-related flow were indeed typical as the coefficients were almost always insignificant and show little pattern. Finally, we also ran the regression with only UMP-related flows to see these flows alone seem to affect asset prices. The results, reported in Tables 10–11, have a similar pattern to the EPFR data as a whole. In particular, the small number of incorrectly signed ones (three for equities and nine for bonds) would occur randomly less than one percent of the time.

**56. The evidence also suggests an impact of overall and UMP-related fund flows on bilateral exchange rates.** The complication in this case is determining the appropriate exchange rate, particularly between advanced economies many of which had UMP programs. In the end we focused on the dollar bilateral rate for 13 emerging markets. The results (not reported for the sake of brevity) again find relatively few incorrectly signed coefficients, suggesting that there is indeed a link between movements in bilateral dollar exchange rates and both overall and UMP-related fund flows.

## D. Testing the Effectiveness of Forward Guidance on Daily Asset Prices

**57. The final issue we examine is the impact of forward guidance on interest rate policy on asset prices.** To answer this question, we revert to a standard event study approach in which daily data on asset price movements are related to changes in asset prices. Starting from our earlier work, reported in IMF 2013b, we decomposed the impact of UMP announcements on asset prices into two components: the surprise element of the announcement and the impact of the surprise on the asset price. Second: we test the impact of forward guidance in isolation from the impact of asset purchase announcements, based on the consideration that forward guidance may have a different effect on asset prices per unit of monetary surprise from asset purchase announcements.

**58. The impact of unconventional monetary policies is estimated on two-daily returns from January 1, 2003 until June 26, 2013 for three asset markets** (bond, equity and foreign exchange market) in a wide range of countries—23 AEs and 11 EMs—and reported for selected subgroups of advanced and EMs having similar characteristics.<sup>15</sup> Spillovers from pre-crisis easing, post-crisis policy announcements not involving unconventional monetary policy, and unconventional monetary announcements are examined by looking at the change in asset price for a given monetary surprise—as it is the surprise, after all, that moves asset prices.<sup>16</sup>

**59. The analysis is adapted to take account of “typical” international and domestic financial linkages as well as differing time zones.** High correlations in asset prices both across and within countries imply complex dynamics, even at daily frequencies. A two-stage approach is used to account for this “typical” behavior. First, the transmission of shocks between bond yields, equity prices, and exchange rates within and between the four major financial markets is examined

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<sup>15</sup>The advanced markets included in the analysis are Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, adopted Germany, Greece, Ireland, Italy, Japan, Korea, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the U.K., and the U.S. The emerging markets are Brazil, China, India, Indonesia, Malaysia, Mexico, Poland, Russia, South Africa, Thailand, and Turkey. In the context of the event study, country-specific estimates have been pooled across selected country subgroups using Generalized Least Squares with robust standard errors for panel regressions with cross-sectional dependence. The country grouping is specified at the bottom of the relevant tables and figures.

<sup>16</sup>This analysis—first elaborated in the context of IMF 2013a, 2013b, and 2013c—measures monetary surprises by changes in 1-year-ahead futures 3-month LIBOR rate, as the change in futures on a policy announcement day reflects the surprise associated with the announcement. For each asset purchase program considered in the analysis, the estimated surprise effect is summarized in Table 15.

in a simultaneous manner.<sup>17</sup> Next, the corresponding underlying shocks are used as inputs into a similar system for each other small open economy in turn, to account for linkages across domestic assets within each of these smaller economies. Hence, for example, the model for Brazil takes account of financial markets shocks from the four major markets as well as interactions across Brazilian asset prices.

**60. Finally, a two-day window is used to study events given differing time zones—in particular, Asian markets in any given day are closed before the same day session in the U.S. starts.** Tables 11–13 summarize the estimated cumulative effect of the surprise for each type of announcement and each group of countries. For example, in Table 11, the “Latin America” bar corresponding to the U.S. “LSAP1A” entry shows that the surprise associated with the U.S. purchase of MBS and Agency bonds during the first phase of LSAP1 lowered long-term bond rates in Brazil and Mexico by over 9 bps.

**61. The results suggest that forward guidance was effective in boosting the economy, and tended to work differently from announcements of asset purchase programs.** Asset purchase programs, particularly in the U.S., appear to have worked by lowering global bond yields (Table 12) associated with some fall in equity prices (Table 13) and depreciation in the currency against the dollar (Table 14, where a positive sign implies a depreciation). By contrast, the primary impact of future forward guidance appears to have been to increase global equity prices and appreciate local currencies, with little impact on bond yields. Similarly, in Japan it was forward guidance that seems to have boosted equity prices, rather than the launch of the QQME asset purchase program. These results intuitively correspond with the instruments being used—asset purchases, which were overwhelming of bonds, affected bond prices most while forward guidance, aimed at boosting current and future economic activity via looser financial conditions, benefiting equity values. Indeed, at least in the U.S. forward guidance announcements do seem to have been associated with a larger reduction in expectations of future interest rates than bond purchase announcements (Table 15). Finally, for the ECB, major spillover effects seem to have come from Draghi’s “whatever it takes” speech, which was the pre-announcement of OMT, rather than from the later set-up of OMT.

**62. The results also find a significant impact from Fed announcements on tapering for market assessments of future monetary policy.** These announcements led to a major increase in the expected level of the 3-month Libor rate in one year, our measure of market “surprise.” This helps explain the generalized repricing of risks, rising domestic interest rates and weakening equity prices in most emerging markets.

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<sup>17</sup> The approach is similar to that taken in Ehrmann, Fratzscher, and Rigobon (2011), although extended and modified to analyze spillovers between bond, equity, exchange rate, and money markets within and between the four systemic economies. Details of the underlying study will be provided in a separate working paper (Sgherri, forthcoming).

## E. Conclusions

**63. The results reported in this paper suggest several general conclusions about the impact of UMP.** First, different forms of UMP seem to operate through different mechanisms. It was always understood that UMP came in many flavors—“forward guidance” about the future path for policy rates, specific purchases of private sector assets to stabilize particular markets, and more widely spread “quantitative easing” to lower bond yields. The results in this paper suggest that these policies also worked in different ways. In particular, forward guidance announcements—the more “conventional” part of UMP—seem to have worked conventionally, with a large immediate impact on equity prices markets as traders marked down expected future short rates. For quantitative easing—the less “conventional” part—actual purchases of assets seem to have had a significant impact on capital flows, suggesting an important role for portfolio balance effects. This implies that at least some aspects of UMP were quite different from conventional policies. Another take away is that it is difficult to summarize UMP by any simple metric—such as the size of asset purchases or length of forward guidance.

**64. The results also suggest that the impact of UMP differed depending on market conditions as well as chosen instruments.** Policies put in at a time of market turmoil had rather different effects than those in more tranquil times, while the May 22 tapering announcement clearly also surprised traders. This is a useful reminder that monetary policy works through markets, and that its impact cannot be separated from the market mood. It further underlines how difficult it is to measuring the impact of UMP. The results also suggest that, at least in the U.S., the inflows into domestic markets per dollar of central bank asset purchases have fallen over time, with U.S. LSAP1B being associated with private sector inflows into U.S. bond markets and U.S. LSAP2 and LSAP3 in particular with outflows to the rest of the world.

**65. Finally, the results also suggest that most bond flows to emerging markets continue to be driven by a single global factor.** On the other hand, this seems to be less true of equity flows or of bond market flows to advanced economies. This suggests that bond flows to emerging markets may be a particularly important source for market risk.

**Table 2. Impact of the Global Factor on Bond and Equity Funds Flows over May 22 to August 26**  
(US\$ millions unless otherwise indicated)

	Bonds			Equities		
	Actual Flows	Estimated flows due to global factor	As percent of bond market size	Actual Flows	Estimated flows due to global factor	As percent of equity market size
<i>Emerging Markets</i>	-9873	-9818	-0.19	-20389	-20361	-0.21
<i>Africa</i>	-292	-292	-0.21	-861	-861	-0.15
<i>Asia</i>	-2870	-2862	-0.11	-11584	-11570	-0.23
China	-105	-104		-6092	-6092	
India	-35	-34		-1565	-1565	
Indonesia	-868	-868		-511	-496	
South Korea	-313	-311		-2099	-2099	
Malaysia	-343	-343		-450	-450	
Philippines	-925	-923		-220	-220	
Thailand	-280	-278		-647	-647	
<i>Europe</i>	-2364	-2322	-0.32	-2993	-2979	-0.25
Czech Republic	-20	-20		-55	-53	
Hungary	-72	-72		-129	-126	
Poland	-262	-262		-26	-26	
Russia	-1178	-1169		-2357	-2357	
Turkey	-600	-568		-424	-416	
Ukraine	-232	-232		-2	-2	
<i>Latin America</i>	-4343	-4337	-0.26	-4945	-4945	-0.22
Argentina	-1106	-1106		-73	-73	
Brazil	-1811	-1811		-3817	-3817	
Colombia	-360	-360		-6	-6	
Mexico	-1065	-1060		-1049	-1049	
<i>Middle East</i>	-5	-5	0.00	-6	-6	0.00
<i>o/w BRICS</i>	-3129	-3118		-13831	-13831	
<i>Advanced Economies</i>	-10737	-10770		28891	27116	
<i>Asia</i>	-1242	-1241		2251	2251	
Australia	-152	-152		-192	-192	
Hong Kong	-40	-40		-1458	-1458	
Japan	-855	-855	-0.01	4134	4134	0.12
Singapore	-195	-193		-234	-234	
<i>Europe</i>	-1926	-1960	-0.02	9762	9003	0.11
<i>Euro Area</i>	-1371	-1407	-0.02	5889	5530	0.13
Austria	-50	-50		67	66	
Belgium	-93	-93		234	220	
Finland	-26	-26		149	140	
France	-292	-292		1429	1384	
Germany	-1008	-1008		1582	1463	
Greece	-2	-2		349	349	
Ireland	-28	-28		145	135	
Italy	-104	-104		664	607	
Netherlands	-122	-122		727	679	
Portugal	-11	-11		26	24	
Spain	366	330		517	462	
Norway	-184	-183		147	137	
Sweden	-41	-41		206	181	
Switzerland	-6	-5		831	705	
United Kingdom	-325	-325	-0.02	2689	2450	0.08
<i>North America</i>	-7569	-7569	-0.05	16878	15863	0.10
Canada	44	44	0.00	-371	-371	-0.02
USA	-7613	-7613	-0.06	17249	16234	0.11
Total Outflows	-21020	-20962	-0.05	-22643	-22616	-0.05
Total Inflows	410	374	0.00	31145	29371	0.07
Net	-20610	-20588	-0.05	8502	6755	0.02

Source: EPFR database; IMF 2013 April GFSR; and staff calculations.



**Table 3. Correlation and Relative Size of Adjusted EPFR Data and BoP Data**  
 (2008–12)

	Bond Flows (EPFR vs BOPS)		Equity Flows (EPFR vs BOPS)	
	Correlation	EPFR as a ratio of BoP Data	Correlation	EPFR as a ratio of BoP Data
<b>Emerging Markets</b>	0.44	0.08	0.38	0.22
<i>Africa</i>	0.61	0.04	0.31	0.39
Botswana	0.61	0.04	0.31	0.39
Egypt	0.57	0.02	0.17	0.46
Ghana	0.61	0.04	0.31	0.39
Ivory Coast	0.61	0.04	0.31	0.39
Nigeria	0.61	0.04	0.31	0.39
South Africa	0.66	0.05	0.44	0.32
Tunisia	0.61	0.04	0.31	0.39
Zambia	0.61	0.04	0.31	0.39
<i>Asia</i>	0.39	0.07	0.48	0.23
China	0.10	0.02	0.73	0.46
India	0.15	0.01	0.79	0.27
Indonesia	0.58	0.13	0.55	0.44
South Korea	0.52	0.03	0.83	0.25
Malaysia	0.66	0.03	0.79	0.21
Pakistan	0.07	0.08	0.42	0.10
Philippines	0.47	0.22	0.35	0.23
Sri Lanka	0.39	0.07	-0.30	0.04
Taiwan	0.39	0.07	0.48	0.23
Thailand	0.56	0.03	0.46	0.23
Vietnam	0.39	0.07	0.21	0.11
<i>Europe</i>	0.51	0.06	0.34	0.19
Bulgaria	0.50	0.10	0.70	0.18
Croatia	0.30	0.02	0.46	0.01
Czech Republic	0.57	0.02	0.34	0.27
Hungary	0.35	0.06	-0.19	0.16
Kazakhstan	0.28	0.02	0.41	0.10
Lithuania	0.31	0.01	0.05	0.03
Poland	0.77	0.05	0.61	0.22
Romania	0.53	0.01	-0.08	0.13
Russia	0.78	0.16	0.70	0.54
Turkey	0.62	0.11	0.60	0.31
Ukraine	0.65	0.08	0.14	0.10
<i>Latin America</i>	0.39	0.18	0.31	0.31
Argentina	0.46	0.22	0.18	0.24
Brazil	0.57	0.17	0.71	0.39
Chile	0.41	0.02	-0.28	0.18
Colombia	0.17	0.16	0.30	0.08
Mexico	0.65	0.07	0.74	0.28
Panama	-0.06	0.39	0.31	0.31
Peru	0.59	0.14	0.29	0.99
Venezuela	0.33	0.23	0.22	0.02
<i>Middle East</i>	0.36	0.01	0.39	0.03
Bahrain	0.25	0.01	0.74	0.01
Israel	0.34	0.01	0.22	0.05
Kuwait	0.36	0.01	0.39	0.03
Lebanon	0.09	0.02	0.05	0.01
Qatar	0.75	0.01	0.54	0.07
United Arab Emirates	0.36	0.01	0.39	0.03
<i>o/w BRICS</i>	0.45	0.08	0.67	0.40
<b>Advanced Economies</b>	-0.01	0.02	0.26	0.14
<i>Asia</i>	0.23	0.01	0.41	0.11
Australia	0.52	0.00	0.38	0.09
Hong Kong	0.04	0.01	0.33	0.16
Japan	0.12	0.01	0.54	0.08
Singapore	0.23	0.01	0.41	0.11
<i>Europe</i>	-0.07	0.01	0.23	0.11
<i>Euro Area</i>	-0.11	0.02	0.33	0.11
Austria	-0.67	0.03	0.49	0.15
Belgium	-0.20	0.02	0.12	0.06
Finland	0.27	0.03	0.09	0.21
France	-0.04	0.01	0.33	0.09
Germany	0.03	0.04	0.50	0.18
Greece	-0.26	0.01	0.30	0.23
Ireland	-0.20	0.01	0.02	0.00
Italy	-0.10	0.01	0.55	0.06
Netherlands	0.03	0.01	0.69	0.09
Portugal	-0.18	0.00	-0.06	0.01
Spain	0.12	0.00	0.60	0.08
Denmark	-0.04	0.01	0.14	0.03
Norway	-0.03	0.02	0.31	0.09
Sweden	0.28	0.01	0.37	0.20
Switzerland	0.03	0.00	-0.38	0.17
United Kingdom	-0.15	0.01	-0.32	0.10
<i>North America</i>	0.12	0.12	0.24	0.38
Canada	0.14	0.04	0.50	0.11
US 1/	0.09	0.19	-0.03	0.64

Sources: EPFR database; IMF BOPS; and staff calculations.

Notes: Shaded values use the average of the region as BoP data were unavailable.

**Table 4. Regression Results for EPFR Bond Fund Flows**

	US_LSAP1 A	US_LSAP1 B	US LSAP1A Purchases	US LSAP1B Purchases	US_LSAP2 Announce	US_LSAP2 Purchases	US Twst Announce	US Twst Period	US_LSAP3 Announce	US_LSAP3 Purchases	US Tapering Announce	US Tapering Purchases	UK_LSAP1 Purchases	UK_LSAP1 Announce	UK_LSAP2 Announce	UK_LSAP2 Purchases	UK FLS Announce	UK FLS Purchases
<b>Emerging Markets</b>																		
<b>Africa</b>																		
Botswana	0	0	0.0000	0.0000	0	0.0000							0.0000	0				
Egypt	-4	2	-0.0009	0.0000	3	-0.0001	-4	1	2	0.00	5	-0.0006	0.0003	-1	0	0.0000	-1	0.0010
Ghana	-2	1	-0.0004	0.0000	1	0.0000	-1	0	1	0.00	3	-0.0004	0.0001	0	1	0.0001	-1	0.0005
Ivory Coast	-1	0	-0.0002	0.0000	1	0.0000	-1	0	0	0.00	2	-0.0002	0.0001	0	0	0.0000	0	0.0002
Nigeria	-5	2	-0.0009	0.0000	3	-0.0001	-4	0	2	0.00	9	-0.0010	0.0003	-1	1	0.0001	-2	0.0010
South Africa	-15	5	-0.0025	0.0002	9	0.0000	-7	1	4	0.00	24	-0.0027	0.0009	-3	1	0.0004	-6	0.0030
Tunisia	-1	0	-0.0001	0.0000	0	0.0000	0	0	0	0.00	1	-0.0001	0.0000	0	0	0.0000	0	0.0001
Zambia	0	0	0.0000	0.0000	0	0.0000				0.00	1	-0.0002	0.0000	0				0.0000
<b>Asia</b>																		
China	-3	1	-0.0011	0.0000	2	-0.0002	-3	-1	-5	0.00	4	0.0004	-0.0001	-2	-3	-0.0007	-2	0.0003
India	-2	1	-0.0005	0.0000	2	0.0000	-1	1	0	0.00	6	-0.0006	0.0001	-1	-2	-0.0001	0	0.0004
Indonesia	-35	13	-0.0069	0.0003	23	-0.0001	-18	5	12	0.00	74	-0.0079	0.0023	-7	-9	-0.0003	-8	0.0062
South Korea	-16	7	-0.0031	0.0001	11	0.0002	-3	5	2	0.00	32	-0.0034	0.0013	-3	-5	-0.0006	-1	0.0007
Malaysia	-16	6	-0.0032	0.0001	13	-0.0001	-10	3	6	0.00	38	-0.0042	0.0011	-4	-6	-0.0002	-5	0.0027
Pakistan	-1	0	-0.0003	0.0000	1	0.0000	-1	0	1	0.00	3	-0.0003	0.0001	0	0	0.0000	0	0.0003
Philippines	-36	14	-0.0079	0.0003	28	-0.0003	-20	5	13	0.00	77	-0.0081	0.0021	-10	-5	-0.0007	-4	0.0064
Sri Lanka	0	0	0.0000	0.0000	0	0.0000	0	0	0	0.00	0	0.0000	0.0000	0	0	0.0000	0	0.0000
Taiwan	0	0	0.0000	0.0000	0	0.0000	-1	0	1	0.00	3	-0.0003	0.0000	0	-2	-0.0001	0	0.0000
Thailand	-4	2	-0.0011	0.0000	3	-0.0001	-3	1	1	0.00	11	-0.0011	0.0002	-2	-3	-0.0002	0	0.0006
Vietnam	-1	0	-0.0001	0.0000	0	0.0000	0	0	0	0.00	1	-0.0001	0.0000	0	0	0.0000	0	0.0001
<b>Europe</b>																		
Bulgaria	-3	1	-0.0004	0.0000	1	0.0000	0	0	2	0.00	2	-0.0002	0.0003	0	1	0.0003	1	0.0005
Croatia	-2	0	-0.0002	0.0000	1	0.0000	0	0	0	0.00	2	-0.0001	0.0001	0	0	0.0001	0	0.0004
Czech Republic	-5	-2	-0.0005	0.0000	2	0.0000	1	0	1	0.00	3	-0.0001	0.0004	0	0	0.0003	1	0.0001
Hungary	-20	7	-0.0031	0.0005	10	0.0002	0	0	1	0.00	21	-0.0044	0.0012	0	1	0.0005	0	0.0030
Kazakhstan	-6	2	-0.0010	0.0001	3	0.0000	-3	0	1	0.00	10	-0.0009	0.0004	-1	2	0.0002	1	0.0013
Lithuania	-1	0	-0.0002	0.0000	0	0.0000	0	0	0	0.00	2	-0.0002	-0.0001	0	0	0.0000	0	0.0002
Poland	-9	7	-0.0030	0.0003	10	0.0002	-3	0	-4	0.00	26	-0.0020	0.0013	-1	1	0.0004	1	0.0036
Romania	-2	0	-0.0003	0.0000	1	0.0000	0	0	0	0.00	1	-0.0001	0.0001	0	0	0.0001	0	0.0003
Russia	-65	22	-0.0110	0.0006	39	0.0001	-30	-3	7	0.00	18	-0.0080	0.0045	-8	12	0.0007	12	0.0130
Turkey	-58	20	-0.0100	0.0007	33	-0.0001	-27	-2	6	0.00	58	-0.0032	0.0031	-11	20	0.0012	16	0.0268
Ukraine	-12	4	-0.0021	0.0001	8	0.0000	-6	0	2	0.00	18	-0.0015	0.0008	-2	4	0.0003	3	0.0024
<b>Latin America</b>																		
Argentina	-61	17	-0.0083	0.0010	23	-0.0002	-41	21	38	0.00	52	-0.0148						
Brazil	-111	33	-0.0109	0.0013	41	0.0006	-77	27	67	0.00	74	-0.0222						
Chile	-4	1	-0.0005	0.0001	2	0.0000	-2	1	2	0.00	3	-0.0009						
Colombia	-23	6	-0.0032	0.0003	10	-0.0001	-17	8	14	0.00	18	-0.0053						
Mexico	-70	19	-0.0081	0.0011	34	0.0000	-35	18	41	0.00	64	-0.0138						
Panama	-13	4	-0.0019	0.0002	6	-0.0001	-4	5	8	0.00	11	-0.0031						
Peru	-23	6	-0.0030	0.0004	10	-0.0001	-16	8	14	0.00	19	-0.0053						
Venezuela	-45	13	-0.0060	0.0007	17	-0.0002	-31	16	30	0.00	33	-0.0093						
<b>Advanced Economies</b>																		
<b>Asia</b>																		
Australia	-4	2	-0.0006	0.0001	3	0.0001	0	1	6	0.00	1	-0.0010	0.0004	-1	-4	0.0006	-6	0.0003
Hong Kong	-6	3	-0.0014	0.0000	2	-0.0001	10	3	0	0.00	13	-0.0015	0.0003	-2	-4	-0.0003	-8	0.0015
Japan	-53	27	-0.0082	0.0007	46	0.0015	1	12	-4	0.00	52	-0.0089	0.0091	2	-51	0.0009	-69	0.0101
Singapore	-8	4	-0.0031	0.0000	7	-0.0001	2	7	2	0.00	20	-0.0020	0.0004	-5	-5	-0.0008	-3	-0.0004
<b>Europe</b>																		
<b>Euro Area</b>																		
Austria	-15	6	-0.0004	0.0003	13	0.0005	3	3	-2	0.00	2	-0.0002	0.0015	-1	5	0.0013	-3	0.0030
Belgium	-36	11	-0.0012	0.0006	18	0.0007	-3	2	-8	0.00	34	-0.0019	0.0023	-4	-5	0.0005	-5	0.0017
Finland	-20	5	-0.0003	0.0004	11	0.0005	4	3	2	0.00	18	-0.0007	0.0005	-1	2	0.0011	-5	0.0032
France	-74	26	-0.0035	0.0017	50	0.0026	-5	13	-6	0.00	84	-0.0038	0.0046	0	-13	0.0014	17	0.0096
Germany	-73	8	-0.0112	0.0030	30	0.0022	-56	-61	-62	0.00	54	-0.0077	0.0073	-5	-16	-0.0142	18	-0.0081
Greece	-5	2	0.0000	0.0003	-10	0.0002	-4	0	1	0.00	5	0.0001	0.0003	1	1	0.0001	-1	0.0015
Ireland	-7	3	-0.0002	0.0003	8	0.0003	3	2	1	0.00	12	-0.0003	0.0009	1	2	0.0008	-3	0.0022
Italy	-34	11	-0.0004	0.0013	27	0.0012	1	13	4	0.00	46	-0.0013	0.0014	0	1	0.0025	-24	0.0092
Netherlands	-24	9	-0.0015	0.0009	21	0.0009	1	4	-3	0.00	34	-0.0015	0.0018	1	-2	0.0015	-9	0.0046
Portugal	-1	0	-0.0001	0.0000	0	0.0000	0	0	0	0.00	1	-0.0001	0.0001	0	0	0.0000	0	0.0001
Spain	-3	1	-0.0003	0.0001	4	0.0002	-1	1	-1	0.00	-1	0.0004	0.0004	1	-3	0.0001	-2	0.0001
Denmark	-4	2	-0.0004	0.0000	4	0.0002	-8	2	-1	0.00	6	-0.0005	0.0009	0	2	0.0004	4	0.0010
Norway	-12	5	-0.0015	0.0002	6	0.0003	7	11	1	0.00	42	-0.0050	0.0012	-1	30	0.0008	-3	0.0022
Sweden	-12	-2	-0.0030	0.0003	17	0.0000	9	-12	-8	0.00	4	-0.0006	0.0020	4	-9	-0.0007	-10	0.0046
Switzerland	-1	0	0.0004	0.0000	2	0.0000	4	-3	-4	0.00	0	0.0000	0.0004	1	1	0.0003	1	0.0012
United Kingdom	-49	31	-0.0060	0.0011	32	0.0013	-2	1	14	0.00	57	-0.0063	0.0071	10	-24	0.0030	-4	-0.0050
<b>North America</b>																		
Canada	-23	20	-0.0093	0.0021	33	0.0003	12	10	20	0.00	-14	0.0005						
US 1/	-173	796	-0.0460	0.0464	430	-0.0463	-573	543	1225	0.01	2826	-0.4603						

**Table 4. Regression Results for EPFR Bond Fund Flows (concluded)**

	Euro Area LTRO Purchases	Euro Area SMP Purchases	Euro Area OMT Announce	EA Speech	Euro Area Rate Cut Announce	Japan pre- LSAP Purchases	Japan LSAP Announce	Japan LSAP Purchases	Japan QQME Announce	Japan QQME Purchases	VIX	OIL	COMMNE
<b>Emerging Markets</b>													
<i>Africa</i>													
Botswana	0	0				0.0000					0.0000	0.0000	0.0000
Egypt	0	0	-1	-3	5	0.0003		3	0.0005	-1	0.0001	0.0000	0.0004
Ghana	0	0	0	-1	2	0.0002		1	0.0002	0	0.0000	0.0000	0.0003
Ivory Coast	0	0	0	-1	1	0.0001		1	0.0001	0	0.0000	0.0000	0.0001
Nigeria	0	0	-1	-3	4	0.0003		4	0.0005	-1	0.0001	0.0000	0.0007
South Africa	0	0	-2	-8	13	0.0010		10	0.0014	-4	0.0003	-0.0001	0.0021
Tunisia	0	0	0	0	0	0.0000		0	0.0001	0	0.0000	0.0000	0.0001
Zambia	0	0			1	-0.0001		0	0.0000	0	0.0000	0.0000	0.0000
<i>Asia</i>													
China	0	0	-4	-2	0	0.0010		5	0.0018	-7	0.0003	0.0001	0.0008
India	0	0	-1	-3	1	0.0001		1	0.0002	-3	0.0001	0.0001	0.0004
Indonesia	0	0	-5	-22	31	0.0020		27	0.0037	-18	0.0007	0.0004	0.0062
South Korea	0	0	3	-11	15	0.0009		8	0.0014	-16	0.0005	0.0003	0.0029
Malaysia	0	0	-2	-12	12	0.0011		16	0.0020	-13	0.0004	0.0005	0.0029
Pakistan	0	0	0	-1	1	0.0001		1	0.0002	0	0.0000	0.0000	0.0002
Philippines	0	0	-6	-23	23	0.0019		28	0.0040	-24	0.0008	0.0008	0.0060
Sri Lanka	0	0	0	0	0	0.0000		0	0.0000	0	0.0000	0.0000	0.0000
Taiwan	0	0	0	-1	0	-0.0001		1	0.0000	-2	0.0000	0.0001	0.0001
Thailand	0	0	-1	-3	3	0.0003		4	0.0005	-3	0.0001	0.0002	0.0007
Vietnam	0	0	0	0	1	0.0000		0	0.0001	0	0.0000	0.0000	0.0001
<i>Europe</i>													
Bulgaria	0	0	0	-1	-2						-0.0001	0.0006	0.0009
Croatia	0	0	0	-1	1						0.0000	0.0002	0.0005
Czech Republic	0	0	4	1	1						0.0001	0.0006	0.0020
Hungary	0	0	-2	-6	17						-0.0003	0.0030	0.0074
Kazakhstan	0	0	-1	-3	7						0.0000	0.0006	0.0026
Lithuania	0	0	0	-1	2						0.0000	0.0001	0.0003
Poland	0	0	-4	-9	22						-0.0003	0.0029	0.0067
Romania	0	0	0	0	1						0.0000	0.0002	0.0005
Russia	0	0	-15	-34	104						-0.0009	0.0088	0.0237
Turkey	0	0	-19	-30	77						-0.0002	0.0077	0.0256
Ukraine	0	0	-2	-6	15						0.0000	0.0016	0.0051
<i>Latin America</i>													
Argentina	0	0	7	-21	53						-0.0004	0.0095	0.0183
Brazil	0	0	30	-25	42						-0.0022	0.0183	0.0232
Chile	0	0	1	-1	4						0.0000	0.0007	0.0011
Colombia	0	0	2	-8	19						-0.0001	0.0032	0.0073
Mexico	0	0	9	-23	85						-0.0001	0.0097	0.0188
Panama	0	0	1	-5	12						-0.0001	0.0019	0.0043
Peru	0	0	3	-8	23						-0.0001	0.0034	0.0068
Venezuela	0	0	6	-15	43						-0.0004	0.0068	0.0129
<b>Advanced Economies</b>													
<i>Asia</i>													
Australia	0	0	2	0	5	0.0002		5	0.0002	-2	-0.0001	0.0001	0.0014
Hong Kong	0	0	5	-10	4	-0.0002		6	0.0006	-7	0.0002	0.0004	0.0008
Japan	0	0	13	-35	71	0.0062		47	0.0071	-24	0.0011	0.0019	0.0139
Singapore	0	0	-1	-10	4	0.0012		5	0.0019	-10	0.0003	0.0009	0.0012
<i>Europe</i>													
<i>Euro Area</i>													
Austria	0	0	67	-119	566	0.0199		-14	0.0407	266	0.0065	-0.0182	0.0486
Belgium	0	0	2	-1	11						0.0000	0.0019	-0.0004
Finland	0	0	-1	-8	36						-0.0005	0.0055	-0.0001
France	0	0	0	-8	20						0.0002	0.0015	0.0041
Germany	0	0	16	-17	110						-0.0010	0.0081	0.0074
Greece	0	0	45	23	231						-0.0177	0.0256	-0.0246
Ireland	0	0	-1	-2	6						-0.0002	0.0006	-0.0021
Italy	0	0	-1	-5	17						-0.0001	0.0012	-0.0005
Netherlands	0	0	-13	-16	51						-0.0010	0.0042	-0.0045
Portugal	0	0	-1	-14	46						-0.0002	0.0033	0.0005
Spain	0	0	0	-1	2						0.0000	0.0001	0.0004
Denmark	0	0	0	-1	18						-0.0001	0.0009	0.0000
Norway	0	0	0	-4	9						0.0000	0.0015	0.0000
Norway	0	0	10	0	27						-0.0002	0.0028	0.0007
Sweden	0	0	-2	-7	3						0.0001	-0.0021	0.0078
Switzerland	0	0	-2	0	0						0.0000	-0.0002	0.0002
United Kingdom	0	0	38	-8	63						-0.0005	0.0068	0.0136
<i>North America</i>													
Canada											-0.0015	0.0096	0.0024
US 1/											-0.1223	0.3926	-0.872

Sources: EPFR database; IMF 2013 April GFSR; and staff calculations.

Notes. Dark, medium, and light blue indicate the coefficient is significant at the 1, 5, and 10 percent level. Gray indicates an insignificant coefficient.

Table 5. Regression Results for EPFR Equity Fund Flows

	US_LSAP1 A	US_LSAP1 B	US LSAP1A Purchases	US LSAP1B Purchases	US_LSAP2 Announce	US_LSAP2 Purchases	US Twst Announce	US Twst Period	US_LSAP3 Announce	US_LSAP3 Purchases	US Tapering Announce	US Tapering Purchases	UK_LSAP1 Purchases	UK_LSAP1 Announce	UK_LSAP2 Announce	UK_LSAP2 Purchases	UK_FLS Announce	UK_FLS Purchases
<b>Emerging Markets</b>																		
<b>Africa</b>																		
Botswana	-1	0	-0.0002	0.0000	0	0.0000	0	0	0	0.00	0	0.0000	-0.0001	-1	0	0.0001	0	0.0002
Egypt	-7	2	-0.0018	0.0001	18	0.0001	-6	2	-2	0.00	21	-0.0015	0.0004	-6	0	-0.0002	-3	0.0005
Ghana	0	0	0.0000	0.0000	0	0.0000	0	0	0	0.00	0	0.0000	0.0000	0	0	0.0000	0	0.0000
Ivory Coast	0	0	0.0000	0.0000	0	0.0000	0	0	0	0.00	0	0.0000	0.0000	0	0	0.0000	0	0.0000
Nigeria	-1	1	-0.0002	0.0000	0	0.0000	0	0	0	0.00	1	0.0000	-0.0001	-1	1	0.0002	-1	0.0003
South Africa	-10	1	-0.0022	0.0008	82	-0.0009	-5	7	13	0.00	120	-0.0077	0.0038	-24	17	0.0031	-45	-0.0075
Tunisia	0	0	0.0000	0.0000	0	0.0000	0	0	0	0.00	0	0.0000	0.0000	0	0	0.0000	0	0.0000
Zambia	0	0	-0.0001	0.0000	0	0.0000	0	0	0	0.00	0	0.0000	0.0000	0	0	0.0000	0	0.0000
<b>Asia</b>																		
China	-137	-136	-0.0011	-0.0006	238	-0.0076	-84	-132	116	0.02	559	-0.0354	0.0366	-48	-12	-0.0080	-249	-0.0093
India	-36	-16	-0.0222	0.0019	140	-0.0027	-50	1	-28	0.01	111	-0.0120	0.0286	-35	-16	0.0108	-84	-0.0018
Indonesia	-5	5	-0.0021	0.0006	37	-0.0007	-36	-4	-14	0.00	67	-0.0064	0.0022	-11	-9	0.0012	-11	-0.0029
South Korea	10	46	-0.0137	0.0048	222	-0.0015	-75	55	40	0.01	265	-0.0285	0.0210	-68	-160	-0.011	-250	-0.0215
Malaysia	-2	10	-0.0033	0.0010	68	-0.0005	-12	-16	-6	0.00	63	-0.0044	0.0037	-4	-8	-0.0007	-5	-0.0025
Pakistan	0	0	-0.0001	0.0000	2	0.0000	1	0	-1	0.00	5	-0.0002	0.0001	0	-1	0.0000	-1	-0.0001
Philippines	-4	3	-0.0011	0.0002	11	-0.0001	-6	-5	-8	0.00	17	-0.0026	0.0009	-3	-3	-0.0002	-5	-0.0003
Sri Lanka	0	0	0.0000	0.0000	1	0.0000	0	0	0	0.00	1	-0.0001	0.0000	0	0	0.0000	0	0.0000
Taiwan	-44	-17	-0.0230	-0.0014	62	0.0003	-174	31	-17	0.00	112	-0.0146	0.0297	-60	-85	-0.0040	-62	-0.0225
Thailand	-6	-10	-0.0021	0.0002	51	-0.0005	-12	-1	-14	0.00	75	-0.0045	0.0038	-12	-16	0.0006	-37	0.0004
Vietnam	-7	2	-0.0020	-0.0001	1	0.0003	-1	-3	-3	0.00	22	-0.0005	0.0010	2	-3	0.0006	-4	-0.0007
<b>Europe</b>																		
Bulgaria	0	0	0.0000	0.0000	0	0.0000	0	0	0	0.00	0	0.0000	0.0001	0	0	0.0000	0	0.0000
Croatia	0	0	0.0000	0.0000	0	0.0000	0	0	0	0.00	0	0.0000	0.0000	0	0	0.0000	0	0.0000
Czech Republic	-3	4	-0.0008	0.0001	7	0.0001	3	0	-1	0.00	17	-0.0009	0.0015	1	6	0.0007	3	0.0008
Hungary	-4	4	-0.0008	0.0002	10	0.0001	-2	0	-1	0.00	25	-0.0016	0.0014	-2	6	0.0006	3	0.0005
Kazakhstan	-1	1	-0.0002	0.0000	2	0.0000	0	0	0	0.00	6	-0.0004	0.0005	0	1	0.0001	1	0.0002
Lithuania	0	0	0.0000	0.0000	0	0.0000	0	0	0	0.00	0	0.0000	0.0000	0	0	0.0000	0	0.0000
Poland	-10	13	-0.0024	0.0003	15	0.0006	-2	2	-3	0.00	53	-0.0030	0.0037	0	13	0.0011	5	0.0019
Romania	-1	1	-0.0001	0.0000	1	0.0000	0	0	0	0.00	2	-0.0001	0.0002	0	0	0.0001	0	0.0001
Russia	-82	-52	-0.0163	-0.0016	125	0.0045	-130	-37	-41	-0.01	367	-0.0360	0.0377	-67	44	0.0098	19	-0.0055
Turkey	-31	-16	-0.0062	0.0006	60	-0.0008	-6	10	0	0.00	134	-0.0116	0.0051	-18	22	-0.0001	54	-0.0035
Ukraine	-1	1	-0.0001	0.0000	1	0.0000	0	0	0	0.00	2	-0.0001	0.0001	0	1	0.0001	0	0.0001
<b>Latin America</b>																		
Argentina	-2	-1	0.0001	0.0001	4	0.0000	0	-1	-1	0.00	3	-0.0008						
Brazil	-17	-47	0.0132	0.0058	259	-0.0046	26	-105	42	-0.01	-13	-0.0445						
Chile	-7	0	-0.0005	0.0002	24	-0.0002	-7	-6	-5	0.00	0	-0.0025						
Colombia	-3	0	-0.0003	0.0001	7	-0.0001	-3	-2	4	0.00	4	-0.0004						
Mexico	-13	-3	0.0024	0.0007	35	-0.0015	-27	-14	-39	0.01	-12	-0.0119						
Panama	0	0	0.0000	0.0000	0	0.0000	0	0	0	0.00	0	-0.0001						
Peru	-2	3	-0.0002	0.0001	10	0.0000	-6	-4	-8	0.00	16	-0.0015						
Venezuela	0	0	0.0000	0.0000	0	0.0000	0	0	0	0.00	0	0.0000						
<b>Advanced Economies</b>																		
<b>Asia</b>																		
Australia	0	73	-0.0070	0.0014	2	0.0003	26	-15	-43	0.00	14	-0.0020	0.0113	-4	-25	-0.0012	11	0.0071
Hong Kong	-38	15	-0.0105	0.0035	104	0.0002	-15	-14	-49	0.01	353	-0.0292	0.0137	26	-169	0.0053	-9	0.0132
Japan	-12	-20	-0.0093	0.0065	-105	0.0051	281	-72	-431	0.03	832	-0.0680	0.0095	-6	-168	-0.0247	18	0.0550
Singapore	-12	5	-0.0066	-0.0002	46	-0.0004	-11	-13	-8	0.00	46	-0.0026	0.0111	4	-19	0.0003	5	0.0046
<b>Europe</b>																		
<b>Euro Area</b>																		
Austria	5	-2	0.0001	0.0004	7	0.0001	6	-4	-3	0.00	18	-0.0008	0.0014	2	16	0.0007	3	0.0037
Belgium	-3	7	-0.0017	0.0005	1	0.0003	6	-3	0	0.00	9	0.0007	0.0016	13	16	0.0008	8	0.0050
Finland	1	11	-0.0030	0.0007	-2	0.0003	5	1	0	0.00	6	0.0008	0.0025	10	1	0.0010	8	0.0055
France	12	92	-0.0125	0.0054	5	0.0027	6	-27	1	0.01	97	0.0026	0.0071	62	60	-0.0013	30	0.0303
Germany	639	17	-0.0185	-0.0013	32	0.0141	250	-96	-63	0.01	-84	0.0200	0.0222	294	87	-0.0323	58	0.0231
Greece	-6	9	-0.0018	0.0007	-7	0.0004	-20	-1	22	0.00	202	0.0042	0.0007	4	28	0.0011	3	0.0064
Ireland	-2	5	-0.0011	0.0002	-2	0.0001	4	-2	-2	0.00	3	0.0002	0.0006	3	4	0.0002	3	0.0020
Italy	-5	21	-0.0064	0.0027	-11	0.0006	27	-16	25	0.00	44	-0.0008	0.0016	10	39	0.0021	-12	0.0153
Netherlands	18	17	-0.0054	0.0015	-7	0.0007	7	-3	1	0.00	20	0.0016	0.0047	9	32	0.0007	12	0.0131
Portugal	-1	1	-0.0005	0.0001	-1	0.0000	0	-1	0	0.00	2	0.0000	0.0001	1	2	0.0000	1	0.0006
Spain	-9	21	-0.0068	0.0014	-9	0.0010	-4	16	-4	0.00	-17	0.0020	0.0064	22	20	0.0022	-4	0.0138
Denmark	2	5	-0.0009	0.0002	-1	0.0001	6	-2	-2	0.00	3	0.0002	0.0007	1	5	0.0002	1	0.0021
Norway	3	21	-0.0029	0.0003	-4	0.0004	6	-5	-6	0.00	9	0.0000	0.0003	-1	3	0.0009	10	0.0052
Sweden	5	14	-0.0021	0.0006	9	0.0007	12	-11	-8	0.00	1	0.0002	0.0023	7	29	0.0024	5	0.0069
Switzerland	153	29	-0.0212	0.0016	22	0.0008	43	-27	-12	0.00	-41	-0.0055	0.0151	12	42	-0.0028	31	0.0244
United Kingdom	166	111	-0.0232	0.0070	3	0.0059	174	-92	-119	0.01	-18	0.0100	0.0229	109	78	0.0070	16	0.0442
<b>North America</b>																		
Canada	-17	54	0.0001	0.0011	-17	0.0009	188	-24	67	0.00	251	-0.0103						
US 1/	288	-457	0.1875	-0.0102	483	0.0737	-1500	-295	3802	0.14	4454	-0.0220						

**Table 5. Regression Results for EPFR Equity Fund Flows (concluded)**

	Euro Area LTRO Purchases	Euro Area SMP Purchases	Euro Area OMT Announce	EA Speech	Euro Area Rate Cut Announce	Japan pre- LSAP Purchases	Japan LSAP Announce	Japan LSAP Purchases	Japan QQM E Announce	Japan QQM E Purchases	VIX	Oil	COMMNE
<b>Emerging Markets</b>													
<i>Africa</i>													
Botswana	0	0	0	0	1	0.0002	0	0.0000	1	0.0000	0.0000	0.0002	0.0003
Egypt	0	0	-2	6	9	0.0016	11	0.0006	-1	0.0000	-0.0023	-0.0006	0.0042
Ghana	0	0	0	0	0	0.0000	0	0.0000	0	0.0000	0.0000	0.0001	0.0000
Ivory Coast	0	0	0	0	0	0.0000	0	0.0000	0	0.0000	0.0000	0.0000	-0.0001
Nigeria	0	0	-1	0	1	0.0003	0	0.0000	0	0.0000	0.0000	0.0003	0.0003
South Africa	0	0	21	-45	73	0.0017	85	0.0021	-30	-0.0008	-0.0094	-0.0013	0.0092
Tunisia	0	0	0	0	0	0.0000	0	0.0000	0	0.0000	0.0000	0.0000	0.0001
Zambia	0	0	0	0	0	0.0001	0	0.0000	0	0.0000	0.0000	0.0001	0.0001
<i>Asia</i>													
China	0	0	-109	202	277	0.0121	441	0.0215	-450	-0.0084	-0.0578	0.0441	0.0054
India	0	0	-71	77	168	0.0109	158	0.0060	-124	-0.0014	-0.0220	0.0174	0.0321
Indonesia	0	0	3	3	-37	0.0017	28	0.0024	31	0.0007	-0.0037	0.0007	0.0087
South Korea	0	0	-16	-74	-308	-0.0025	247	0.0040	-157	0.0002	-0.0158	0.0152	0.0432
Malaysia	0	0	14	21	15	-0.0008	34	0.0002	-20	-0.0006	-0.0061	-0.0035	0.0176
Pakistan	0	0	0	1	0	0.0000	2	0.0001	-1	0.0000	-0.0002	0.0002	-0.0001
Philippines	0	0	-6	-1	4	-0.0007	11	-0.0005	38	-0.0001	-0.0013	0.0001	0.0024
Sri Lanka	0	0	0	0	0	0.0000	0	0.0000	0	0.0000	-0.0001	0.0000	0.0001
Taiwan	0	0	-12	74	12	0.0033	27	0.0116	-28	-0.0006	-0.0179	0.0102	0.0369
Thailand	0	0	-2	-7	15	-0.0003	40	0.0002	-31	-0.0005	-0.0037	0.0015	0.0046
Vietnam	0	0	0	1	9	-0.0003	6	-0.0014	10	-0.0006	0.0001	0.0018	-0.0014
<i>Europe</i>													
Bulgaria	0	0	0	-1	0	0	0	0	0	0	0.0000	0.0000	0.0001
Croatia	0	0	0	0	0	0	0	0	0	0	0.0000	0.0000	0.0000
Czech Republic	0	0	-2	-1	-1	0	0	0	0	0	-0.0010	-0.0007	0.0040
Hungary	0	0	-2	-2	0	0	0	0	0	0	-0.0011	-0.0003	0.0045
Kazakhstan	0	0	0	0	0	0	0	0	0	0	-0.0003	-0.0002	0.0012
Lithuania	0	0	0	0	0	0	0	0	0	0	0.0000	0.0000	0.0001
Poland	0	0	-9	-9	-1	0	0	0	0	0	-0.0015	0.0001	0.0088
Romania	0	0	0	0	0	0	0	0	0	0	-0.0001	0.0000	0.0006
Russia	0	0	102	1	-34	0	0	0	0	0	-0.0159	0.0364	0.0632
Turkey	0	0	-12	-8	-8	0	0	0	0	0	-0.0053	-0.0028	0.0224
Ukraine	0	0	0	0	0	0	0	0	0	0	-0.0001	-0.0001	0.0005
<i>Latin America</i>													
Argentina	0	0	0	1	0	0	0	0	0	0	-0.0009	0.0005	0.0002
Brazil	0	0	17	106	-31	0	0	0	0	0	-0.0476	0.0833	0.0131
Chile	0	0	-2	6	0	0	0	0	0	0	-0.0017	0.0019	0.0034
Colombia	0	0	1	4	-1	0	0	0	0	0	-0.0005	0.0000	0.0005
Mexico	0	0	-13	43	52	0	0	0	0	0	-0.0116	0.0088	0.0110
Panama	0	0	0	0	0	0	0	0	0	0	-0.0001	0.0000	0.0000
Peru	0	0	-6	-5	-14	0	0	0	0	0	-0.0003	0.0012	0.0021
Venezuela	0	0	0	0	0	0	0	0	0	0	0.0000	0.0000	0.0000
<b>Advanced Economies</b>													
<i>Asia</i>													
Australia	0	0	-18	-29	24	0.0009	26	-0.0001	-17	-0.0010	-0.0034	0.0045	0.0312
Hong Kong	0	0	-52	-23	-46	0.0006	49	0.0041	-24	-0.0020	-0.0175	0.0021	0.0397
Japan	0	0	-138	-300	-813	-0.0247	-75	-0.0049	-932	0.0277	-0.0097	0.0573	0.0264
Singapore	0	0	-25	-3	-27	-0.0023	20	-0.0015	-21	-0.0004	-0.0040	0.0081	0.0102
<i>Europe</i>													
<i>Euro Area</i>													
Austria	0	0	-288	109	-641	-0.0741	45	-0.0437	-546	-0.0075	-0.0954	0.0464	0.1854
Belgium	0	0	-7	-6	-8	0	0	0	0	0	0.0007	-0.0010	0.0051
Finland	0	0	-12	-5	-14	0	0	0	0	0	-0.0022	-0.0030	0.0049
France	0	0	-8	-8	-20	0	0	0	0	0	-0.0022	-0.0045	0.0138
Germany	0	0	-81	38	-111	0	0	0	0	0	-0.0203	-0.0420	0.0097
Greece	0	0	-76	97	-320	0	0	0	0	0	-0.0474	0.0178	0.0386
Ireland	0	0	-13	-6	-16	0	0	0	0	0	-0.0026	-0.0019	0.0099
Italy	0	0	-4	-1	-8	0	0	0	0	0	-0.0008	-0.0011	0.0034
Netherlands	0	0	-18	15	-41	0	0	0	0	0	-0.0051	0.0008	0.0089
Portugal	0	0	-32	-12	-44	0	0	0	0	0	-0.0058	-0.0053	0.0261
Spain	0	0	-2	-1	-2	0	0	0	0	0	-0.0003	-0.0007	0.0019
Denmark	0	0	-68	-18	-37	0	0	0	0	0	-0.0055	-0.0017	0.0065
Norway	0	0	-6	-2	-8	0	0	0	0	0	-0.0007	-0.0003	0.0031
Sweden	0	0	-27	-7	-16	0	0	0	0	0	-0.0011	-0.0074	0.0076
Switzerland	0	0	-9	7	-16	0	0	0	0	0	-0.0030	-0.0019	0.0070
United Kingdom	0	0	-14	27	-20	0	0	0	0	0	-0.0057	0.0053	0.0834
<i>North America</i>													
Canada											-0.0083	0.0140	0.0151
US 1/											-0.2078	-0.7454	2.5619

Sources: EPFR database; IMF 2013 April GFSR; and staff calculations.

Notes: Dark, medium, and light blue indicate the coefficient is significant at the 1, 5, and 10 percent level. Gray indicates an insignificant coefficient.

**Table 6. Impact of UMP on Bond Flows**  
 (US\$ millions unless otherwise indicated)

	Fed						BOE			ECB			BOJ			UMP net impact			
	LSAP1 (Agency Securities)	LSAP1 (Treasuries)	LSAP2	TWIST	LSAP3	TAPERING	LSAP1	LSAP2	FLS	SMP	LTRO	OMT Announc- ements	Rate Cut	Additional purchases	LSAP	QQME	millions US\$	percent GDP	
<b>Emerging Markets</b>	-266807	16046	288	264	90511	-71995	0	30171	-1306	16217	-852	-5770	516	2020	146292	233155	15932	55856	0.22
<i>Africa</i>	-25197	0	357	0	7572	-6453	0	0	0	3531	7	-526	0	19	47348	50313	0	29604	2.78
Botswana	-22	0	0	0	0	0	0	0	0	0	7	-1	0	0	123	12	0	-4	-0.02
Egypt	-7008	0	557	0	1523	-1572	0	0	0	940	0	-141	0	0	16924	13848	0	8147	3.19
Ghana	-2002	0	0	0	475	-612	0	0	0	330	0	-41	0	0	5566	4388	0	2538	6.33
Ivory Coast	-963	0	0	0	367	-252	0	0	0	142	0	-20	0	0	0	2037	0	1311	5.40
Nigeria	-4822	0	0	0	1736	-1167	0	0	0	652	0	-101	0	0	0	9843	0	6140	2.25
South Africa	-9798	0	0	0	3043	-2514	0	0	0	1390	0	-211	0	0	27141	19451	0	11361	2.91
Tunisia	-551	0	0	0	218	-159	0	0	0	78	0	-12	0	0	0	1166	0	741	1.66
Zambia	-30	0	-200	0	209	-178	0	0	0	0	0	0	0	19	-2406	-431	0	-630	-3.04
<i>Asia</i>	-84977	0	-8351	0	33670	-20678	0	39	-6055	1207	2122	-1680	0	0	77567	152422	13756	81477	0.58
China	-11129	0	-8351	0	13659	0	0	0	-5779	0	0	0	0	0	79938	69352	7161	64913	0.79
India	-9908	0	0	0	3254	-2761	0	0	0	0	2128	-250	0	0	0	0	0	-7537	-0.39
Indonesia	-9844	0	0	0	3448	-2661	0	0	0	1076	0	-224	0	0	18645	0	0	10441	1.17
South Korea	-19197	0	0	0	0	-4900	0	0	0	0	0	-518	0	0	0	6595	0	-18020	-1.57
Malaysia	-22566	0	0	0	9062	-7009	0	0	0	0	0	-530	0	0	50260	0	0	29217	9.51
Pakistan	-669	0	0	0	232	-158	0	0	0	91	0	-13	0	0	1240	0	0	723	0.31
Philippines	-6335	0	0	0	1828	-1550	0	0	0	0	0	-137	0	0	0	11536	0	5341	2.22
Sri Lanka	-38	0	0	0	10	-12	0	39	0	0	-6	0	0	0	134	11	0	3	0.00
Taiwan	0	0	0	0	214	-197	0	0	-276	0	0	0	0	0	-2505	154	0	-104	-0.02
Thailand	-4930	0	0	0	1882	-1330	0	0	0	0	0	0	0	0	0	1165	0	-3214	-0.85
Vietnam	-361	0	0	0	81	-100	0	0	0	40	0	-8	0	0	0	60	0	-288	-0.21
<i>Europe</i>	-80472	6426	6422	0	23526	-5480	0	23791	3197	10753	-1582	-1644	516	774	0	0	0	-15063	-0.36
Bulgaria	-750	0	0	0	154	0	0	554	305	107	0	0	0	0	0	0	0	369	0.73
Croatia	-2726	0	489	0	773	-446	0	0	803	494	0	-62	0	0	0	0	0	-675	-1.17
Czech Republic	-5649	0	2493	0	2876	0	0	4962	2088	0	-1186	0	516	0	0	0	0	5585	2.89
Hungary	-9202	2212	0	0	2129	-1380	0	4028	0	1030	0	-196	0	0	0	0	0	-1380	-1.07
Kazakhstan	-8649	0	0	0	2244	-1714	0	0	0	1371	0	-196	0	0	0	0	0	-6945	-3.46
Lithuania	-2089	423	0	0	528	-583	0	0	0	373	-396	0	120	0	0	0	0	-1744	-4.23
Poland	-11993	2284	3929	0	3009	-1487	0	5827	0	1717	0	-302	0	0	0	0	0	2984	0.63
Romania	-5266	1019	0	0	1588	0	0	2414	0	710	0	-108	0	0	0	0	0	358	0.21
Russia	-12735	0	0	0	3378	-1591	0	6006	0	1792	0	-295	0	654	0	0	0	-3445	-0.18
Turkey	-16790	0	0	0	5893	2910	0	0	0	2542	0	-381	0	0	0	0	0	-5826	-0.74
Ukraine	-4622	0	0	0	953	-1189	0	0	0	616	0	-103	0	0	0	0	0	-4345	-2.41
<i>Latin America</i>	-60714	9620	0	0	14898	-34023	0	0	0	0	0	-1679	0	1227	0	0	0	-71898	-1.36
Argentina	-7106	1321	0	0	2516	-4125	0	0	0	0	0	-179	0	0	0	0	0	-7573	-1.59
Brazil	-12586	0	0	0	0	-7845	0	0	0	0	0	-373	0	0	0	0	0	-20805	-0.86
Chile	-4550	872	0	0	1376	-2443	0	0	0	0	0	-123	0	0	0	0	0	-4869	-1.81
Colombia	-3775	644	0	0	1174	-2025	0	0	0	0	0	-87	0	0	0	0	0	-4070	-1.11
Mexico	-22580	4916	0	0	6852	-12199	0	0	0	0	0	-663	0	1227	0	0	0	-23675	-2.04
Panama	-902	156	0	0	274	-491	0	0	0	0	0	-21	0	0	0	0	0	-984	-2.83
Peru	-4209	802	0	0	1315	-2386	0	0	0	0	0	-108	0	0	0	0	0	-4586	-2.29
Venezuela	-5005	910	0	0	1393	-2509	0	0	0	0	0	-125	0	0	0	0	0	-5337	-1.58
<i>Middle East</i>	-15446	0	1860	264	10844	-5361	0	6342	1553	725	-1400	-241	0	0	21377	30420	2175	31736	3.06
<i>o/w BRICS</i>	-56156	0	-8351	0	23335	-14712	0	6006	-5779	3182	2128	-1129	0	654	107079	88803	7161	44488	0.30
<b>Advanced Economies</b>	-545919	319552	686535	5330	123885	-270394	0	491097	-17949	59895	75533	-16234	0	77542	703913	457234	20386	1388951	3.33
<i>Asia</i>	-161773	0	110538	1591	4963	-80572	0	139436	22119	2693	13585	-8022	0	0	703913	457234	20386	522177	6.48
Australia	0	0	29081	0	0	-21335	0	26621	0	0	0	-2184	0	0	0	19169	0	51351	3.33
Hong Kong	-16639	0	-8344	1591	4963	-7003	0	0	2693	0	0	-607	0	0	0	5091	6118	-12137	-4.71
Japan	-95613	0	89801	0	0	-39898	0	139436	0	0	0	-4174	0	0	552192	325145	0	414698	6.93
Singapore	-49522	0	0	0	0	-12337	0	-4502	0	0	13585	-1057	0	0	151721	107829	14268	68264	25.48
<i>Europe</i>	-303122	230399	770473	3739	118922	-73681	0	351661	-40067	57202	61949	-8211	0	77542	0	0	0	1169262	7.21
<i>Euro Area</i>	-102705	191358	598870	0	126073	-8337	0	81600	-54452	32322	61949	-2601	0	74238	0	0	0	924077	7.82
Austria	-2206	3858	18248	0	0	0	0	11922	6189	2439	0	0	0	0	0	0	0	40449	10.33
Belgium	-6115	7699	25161	0	0	0	0	0	0	0	0	-1689	0	0	0	0	0	25055	5.25
Finland	-2664	0	14997	0	0	0	0	0	0	2388	0	0	0	0	0	0	0	14721	5.96
France	-23341	40142	163804	0	41821	0	0	0	0	0	0	0	0	0	0	0	0	222426	8.62
Germany	-18061	23711	46023	0	0	0	0	-60641	0	61949	0	0	0	0	0	0	0	52981	1.57
Greece	0	14555	15335	0	11364	0	0	0	0	0	0	0	0	0	0	0	0	41255	16.18
Ireland	0	18427	48932	0	15843	0	0	34581	0	8672	0	0	0	0	0	0	0	126456	61.77
Italy	-12771	35455	91390	0	31973	0	0	0	0	18823	0	0	0	0	0	0	0	164870	8.32
Netherlands	-8243	22745	65125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	79626	10.34
Portugal	-29304	0	16519	0	0	-8337	0	35098	0	0	0	-912	0	2701	0	0	0	13063	6.20
Spain	0	24766	93336	0	25072	0	0	0	0	0	0	0	0	67560	0	0	0	143174	10.68
Denmark	0	0	28239	-2846	0	-5402	0	34984	8753	3843	0	-795	0	1596	0	0	0	66776	21.60
Norway	-17709	0	12967	6585	-7152	-13929	0	15209	5632	3060	0	0	0	1707	0	0	0	4662	0.93
Sweden	-44891	0	0	0	0	0	0	40156	0	9368	0	0	0	0	0	0	0	4632	0.89
Switzerland	0	0	0	0	0	0	0	0	0	8610	0	0	0	0	0	0	0	8610	1.38
United Kingdom	-137817	39041	130397</																

**Table 7. Impact of UMP on Equity Funds Flows**  
(US\$ millions unless otherwise indicated)

	Fed						BOE			ECB			BOJ			UMP net impact			
	LSAP1 (Agency Securities)	LSAP1 (Treasuries)	LSAP2	TWIST	LSAP3	TAPERING	LSAP1	LSAP2	FLS	SMP	LTRO	OMT Announc- ements	Rate Cut	Additional purchases	LSAP	QQME	millions US\$	percent GDP	
<b>Emerging Markets</b>	-34850	6179	-9536	15	22890	-26079	0	104263	1006	0	-35631	-1485	0	0	12457	34338	-2063	59047	0.23
<i>Africa</i>	-232	0	1278	0	3	0	0	103	0	-1424	0	0	0	5988	3164	0	2892	0.27	
Botswana	-79	0	46	0	0	0	0	40	0	0	0	0	0	617	0	0	7	0.04	
Egypt	0	0	153	0	0	0	0	0	0	0	0	0	0	4140	255	0	408	0.16	
Ghana	-15	0	0	0	0	0	0	0	0	0	0	0	0	81	0	0	-15	-0.04	
Ivory Coast	0	0	0	0	3	0	0	4	0	0	0	0	0	68	0	0	7	0.03	
Nigeria	-101	0	58	0	0	0	0	59	0	0	0	0	0	854	0	0	16	0.01	
South Africa	0	0	1020	0	0	0	0	0	0	-1424	0	0	0	0	2909	0	2505	0.64	
Tunisia	-16	0	0	0	0	0	0	0	0	0	0	0	0	70	0	0	-16	-0.04	
Zambia	-21	0	0	0	0	0	0	0	0	0	0	0	0	158	0	0	-21	-0.10	
<i>Asia</i>	-31732	7315	-7701	0	13780	-8584	0	72229	0	-19955	-43	0	0	0	32631	-2277	55663	0.40	
China	0	0	-13392	0	0	0	0	0	0	0	0	0	0	10459	0	0	-2933	-0.04	
India	-13055	0	0	0	5964	0	0	22171	0	-4718	0	0	0	0	6406	0	16767	0.86	
Indonesia	0	0	-969	0	774	-590	0	0	0	0	0	0	0	0	713	0	-72	-0.01	
South Korea	0	5915	3608	0	0	-7104	0	17924	0	-6124	0	0	0	0	11037	0	25258	2.19	
Malaysia	0	1400	1303	0	1917	0	0	0	0	-1562	0	0	0	0	1791	0	4850	1.58	
Pakistan	0	0	77	0	260	-30	0	0	0	0	0	0	0	0	225	0	531	0.23	
Philippines	0	0	191	0	695	-677	0	0	0	-294	-43	0	0	0	516	164	552	0.23	
Sri Lanka	0	0	70	0	169	-49	0	0	0	0	0	0	0	0	135	0	326	0.54	
Taiwan	-15708	0	0	0	0	0	0	26683	0	-5695	0	0	0	0	5963	0	11243	2.41	
Thailand	0	0	-1017	0	2024	-547	0	3423	0	-1048	0	0	0	0	1899	0	4734	1.26	
Vietnam	-2970	0	2429	0	1976	412	0	2029	0	-514	0	0	0	0	-6514	-2441	-5592	-4.06	
<i>Europe</i>	0	0	10143	20	24	-6698	0	26693	134	-4690	-774	0	0	0	0	0	24852	0.59	
Bulgaria	0	0	39	20	24	0	0	71	0	0	-2	0	0	0	0	0	153	0.30	
Croatia	0	0	137	0	0	0	0	337	0	0	-8	0	0	0	0	0	466	0.81	
Czech Republic	0	0	0	0	0	0	0	1019	0	0	-37	0	0	0	0	0	982	0.51	
Hungary	0	0	0	0	0	-300	0	1857	0	0	-73	0	0	0	0	0	1484	1.15	
Kazakhstan	0	0	0	0	0	-98	0	947	0	0	-24	0	0	0	0	0	825	0.41	
Lithuania	0	0	115	0	0	0	0	213	0	0	-5	0	0	0	0	0	323	0.78	
Poland	0	0	2332	0	0	-846	0	3577	0	0	-111	0	0	0	0	0	4952	1.05	
Romania	0	0	0	0	0	0	0	352	0	0	-8	0	0	0	0	0	344	2.00	
Russia	0	0	6750	0	0	-4075	0	14598	0	-3553	-339	0	0	0	0	0	13380	0.68	
Turkey	0	0	769	0	0	-1380	0	3428	0	-1136	-157	0	0	0	0	0	1524	0.19	
Ukraine	0	0	0	0	0	0	0	296	134	0	-10	0	0	0	0	0	420	0.23	
<i>Latin America</i>	36	282	-14910	-6	4856	-11054	0	0	0	-9247	-633	0	0	0	0	0	-30675	-0.58	
Argentina	0	0	0	0	163	-192	0	0	0	0	0	0	0	0	0	0	-29	-0.01	
Brazil	0	0	-9666	0	0	-7016	0	0	0	-5370	-629	0	0	0	0	0	-22681	-0.94	
Chile	0	0	-493	0	0	-830	0	0	0	-684	0	0	0	0	0	0	-2007	-0.75	
Colombia	0	282	-266	0	0	-306	0	0	0	-425	0	0	0	0	0	0	-715	-0.20	
Mexico	0	0	-4538	0	4693	-2639	0	0	0	-2749	0	0	0	0	0	0	-5233	-0.45	
Panama	0	0	5	0	0	-12	0	0	0	-7	-1	0	0	0	0	0	-15	-0.04	
Peru	0	0	39	0	0	-59	0	0	0	0	0	0	0	0	0	0	-19	-0.01	
Venezuela	36	0	8	-6	0	0	0	0	0	-11	-3	0	0	0	0	0	24	0.01	
<i>Middle East</i>	-2921	-1419	1653	0	4228	257	0	5342	769	-316	-34	0	0	6469	-1456	214	6315	0.61	
<i>o/w BRICS</i>	-13055	0	-15288	0	5964	-11091	0	36768	0	-15066	-968	0	0	0	19774	0	7038	0.05	
<b>Advanced Economies</b>	-131018	120895	289090	3418	243812	-35997	0	134924	-2993	55891	-46874	-8898	0	-10009	0	0	134314	756563	1.81
<i>Asia</i>	-9633	14882	1685	0	88486	-37658	0	66596	-2993	0	-6113	-3096	0	-10009	0	0	134314	246470	3.06
Australia	0	8195	0	0	7363	0	0	27165	0	0	0	0	0	0	0	0	42723	2.77	
Hong Kong	0	6687	0	0	14791	-6796	0	18105	-2993	0	-6113	0	0	0	0	0	23681	9.18	
Japan	0	0	0	0	60402	-30862	0	0	0	0	-3096	0	-10009	0	0	134314	160758	2.69	
Singapore	-9633	0	1685	0	5931	0	0	21326	0	0	0	0	0	0	0	0	19308	7.21	
<i>Europe</i>	-121385	106013	193497	0	155326	2858	0	68327	0	55891	-40761	-5802	0	0	0	0	413964	2.55	
<i>Euro Area</i>	-116939	83691	141649	0	118297	2858	0	17298	0	43178	-36361	-5252	0	0	0	0	248420	2.10	
Austria	0	890	0	0	0	0	0	0	0	0	-964	0	0	0	0	0	-74	-0.02	
Belgium	0	2345	0	0	4179	0	0	0	0	1791	-1819	-257	0	0	0	0	6239	1.31	
Finland	0	943	0	0	1374	0	0	0	0	564	-738	-98	0	0	0	0	2045	0.83	
France	0	17628	23794	0	16852	0	0	0	0	7117	0	0	0	0	0	0	65391	2.53	
Germany	0	0	63450	0	0	0	0	0	0	0	0	0	0	0	0	0	63450	1.88	
Greece	0	0	0	0	2022	2858	0	0	0	604	0	0	0	0	0	0	5485	2.15	
Ireland	-79539	35454	43554	0	59635	0	0	0	0	20713	-26271	-3431	0	0	0	0	50114	24.48	
Italy	-16274	12680	0	0	14164	0	0	0	0	5292	0	-710	0	0	0	0	15151	0.77	
Netherlands	0	5110	0	0	8131	0	0	0	0	3243	0	-463	0	0	0	0	16020	2.08	
Portugal	-7287	3310	0	0	0	0	0	0	0	0	-2405	-293	0	0	0	0	-6675	-3.17	
Spain	-13838	5332	10851	0	11940	0	0	17298	0	3854	-4164	0	0	0	0	0	31273	2.33	
Denmark	-4447	1967	2818	0	3740	0	0	4696	0	1404	-1504	-183	0	0	0	0	8491	2.75	
Norway	0	0	0	0	3718	0	0	0	0	1264	-1997	-367	0	0	0	0	2617	0.52	
Sweden	0	0	3012	0	2115	0	0	0	0	754	-899	0	0	0	0	0	4983	0.96	
Switzerland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	
United Kingdom	0	20356	46018	0	27455	0	0	46333	0	9291	0	0	0	0	0	0	149453	6.14	
<i>North America</i>	0	0	93908	3418	0	-1197	0	0	0	0	0	0	0	0	0	0	96128	0.55	
Canada	0	0	0	3418	0	-1197	0	0	0	0	0	0	0	0	0	0	2221	0.13	
US 1/	0	0	93908	0	0	0	0	0	0	0	0	0	0	0	0	0	93908	0.60	
<b>Net</b>	-165868	127074	279553	3433	266702	-62076	0	239187	-1987	55891	-82505	-10383	0	-10009	12457	34338	132251	815610	1.21

Sources: EPFR database; IMF 2013 April GFSR; and staff calculations.  
1/ Only significant responses at 10 percent level are reported.

**Table 8. Impact of Bond Fund Flows on Bond Yields**

	Bond funds flows	Lagged dependent variable	VIX	Oil prices	Non-energy commodity prices	R <sup>2</sup>	Number of observations
<b>Emerging Markets</b>							
<b>Africa</b>							
South Africa	0.018	0.126	0.002	0.001	-0.006	0.06	285
<b>Asia</b>							
China	0.078	0.249	-0.001	0.004	-0.001	0.16	285
India	-0.204	0.047	0.000	0.006	0.003	0.05	285
Indonesia	-0.146	-0.103	0.011	-0.002	0.012	0.11	285
South Korea	-0.040	0.117	0.001	0.003	0.004	0.04	285
Malaysia	-0.024	0.031	0.000	0.001	0.000	0.01	285
Thailand	0.041	0.101	0.001	0.002	0.006	0.03	285
<b>Europe</b>							
Czech Republic	-0.484	0.197	-0.001	0.003	-0.005	0.07	285
Poland	-0.056	-0.066	0.001	0.000	-0.007	0.05	285
Russia	-0.113	-0.230	0.003	-0.013	0.012	0.12	285
<b>Latin America</b>							
Argentina	-0.783	0.101	0.022	-0.069	0.110	0.08	285
Brazil	-0.009	-0.037	0.002	0.008	-0.006	0.02	285
Mexico	-0.011	0.051	0.001	0.000	-0.008	0.04	285
<b>Advanced Economies</b>							
<b>Asia</b>							
Australia	-0.072	-0.058	-0.002	0.007	-0.001	0.11	285
Japan	0.001	-0.020	-0.001	0.002	-0.003	0.04	285
<b>Europe</b>							
<b>Euro Area</b>							
Austria	-0.083	-0.083	-0.001	0.004	0.000	0.06	285
Belgium	-0.046	-0.027	-0.001	0.004	-0.001	0.03	285
Finland	-0.073	-0.035	-0.002	0.004	0.000	0.13	285
France	-0.017	-0.036	0.000	0.005	0.001	0.07	285
Germany	-0.010	-0.069	-0.002	0.005	-0.001	0.16	285
Greece	-0.596	-0.076	0.026	0.019	-0.018	0.04	285
Ireland	-0.050	0.097	0.000	0.003	0.006	0.02	285
Italy	-0.023	-0.226	0.002	0.005	0.002	0.07	285
Netherlands	-0.049	-0.027	-0.002	0.004	0.000	0.12	285
Portugal	-2.438	0.054	0.000	0.001	0.001	0.00	262
Spain	-0.036	-0.162	0.000	0.005	-0.005	0.03	285
Denmark	-0.239	0.048	-0.002	0.006	-0.001	0.14	285
Norway	-0.102	-0.116	-0.002	0.004	0.000	0.09	285
Sweden	-0.023	-0.074	-0.003	0.005	-0.002	0.16	285
Switzerland	-0.027	-0.049	-0.001	0.003	0.000	0.09	285
United Kingdom	-0.017	-0.078	-0.002	0.008	-0.002	0.15	285
<b>North America</b>							
Canada	-0.003	-0.075	-0.002	0.005	-0.002	0.16	285
US	0.000	-0.113	-0.003	0.006	-0.002	0.15	285

Sources: EPFR, Bloomberg, and staff estimates.

**Legend**

The significance of the variable increases the darker the color. Dark blue indicates a significance level of 1 percent, medium blue of 5 percent, light blue of 10 percent, and grey none.



**Table 9. Impact of Equity Funds Flows on Equity Prices**

	Equity funds flows	Lagged dependent variable	VIX	Oil prices	Non-energy commodity prices	R <sup>2</sup>	Number of observations
<b>Emerging Markets</b>							
<b>Africa</b>							
South Africa	0.603	-0.118	-0.086	0.148	0.190	0.47	285
<b>Asia</b>							
China	0.298	-0.078	-0.048	0.052	0.069	0.20	285
India	0.738	-0.141	-0.077	0.115	0.037	0.30	285
Indonesia	2.606	-0.117	-0.070	0.141	0.039	0.24	285
South Korea	0.539	-0.125	-0.089	0.082	-0.055	0.27	285
Malaysia	1.412	0.003	-0.046	0.079	-0.049	0.29	285
Thailand	2.508	-0.091	-0.078	0.119	0.027	0.26	285
<b>Europe</b>							
Czech Republic	6.495	-0.034	-0.117	0.252	-0.043	0.39	285
Poland	1.615	-0.064	-0.112	0.200	0.001	0.37	285
Russia	0.477	-0.152	-0.170	0.250	0.194	0.40	285
<b>Latin America</b>							
Argentina	12.556	0.102	-0.145	0.257	0.263	0.47	285
Brazil	0.185	-0.085	-0.135	0.238	0.079	0.51	285
Mexico	0.496	-0.095	-0.097	0.119	0.146	0.45	285
<b>Advanced Economies</b>							
<b>Asia</b>							
Australia	0.466	-0.030	-0.095	0.126	-0.053	0.32	285
Japan	0.218	-0.051	-0.114	0.125	0.019	0.31	285
<b>Europe</b>							
<b>Euro Area</b>							
Austria	1.611	-0.019	-0.178	0.224	0.093	0.46	285
Belgium	2.899	-0.012	-0.136	0.089	0.099	0.47	285
Finland	2.223	-0.127	-0.148	0.107	0.114	0.47	285
France	0.459	-0.038	-0.159	0.146	0.042	0.58	285
Germany	0.008	0.010	-0.158	0.115	0.103	0.47	285
Greece	1.585	0.010	-0.150	0.183	0.003	0.24	285
Ireland	8.405	-0.074	-0.151	0.197	-0.174	0.35	285
Italy	1.088	-0.026	-0.177	0.130	0.070	0.48	285
Netherlands	1.322	-0.028	-0.137	0.143	0.049	0.52	285
Portugal	20.366	-0.124	-0.123	0.085	0.055	0.38	285
Spain	0.966	-0.047	-0.172	0.124	-0.042	0.45	285
Denmark	9.389	-0.097	-0.107	0.144	-0.017	0.37	285
Norway	2.295	-0.097	-0.144	0.271	0.083	0.53	285
Sweden	1.700	-0.136	-0.143	0.065	0.003	0.44	285
Switzerland	0.104	-0.035	-0.124	0.082	-0.072	0.41	285
United Kingdom	0.218	0.014	-0.127	0.094	0.078	0.58	285
<b>North America</b>							
Canada	0.106	0.002	-0.090	0.187	0.247	0.65	285
US	0.010	0.065	-0.144	0.152	0.045	0.67	285

Sources: EPFR, Bloomberg, and staff estimates.

**Legend**

The significance of the variable increases the darker the color. Dark blue indicates a significance level of 1 percent, medium blue of 5 percent, light blue of 10 percent, and grey none.

**Table 10. Impact of UMP-related Bond Fund Flows on Bond Yields**

	UMP_Bonds	Lagged dependent variable	VIX	Oil prices	Non-energy commodity prices	R <sup>2</sup>	Number of observations
<b>Emerging Markets</b>							
<b>Africa</b>							
South Africa	-0.054	0.121	0.002	0.001	-0.006	0.06	285
<b>Asia</b>							
China	0.027	0.257	-0.001	0.004	0.000	0.16	285
India	-0.838	0.046	0.000	0.006	0.002	0.06	285
Indonesia	0.087	-0.080	0.011	-0.003	0.010	0.09	285
South Korea	-0.047	0.119	0.001	0.003	0.003	0.04	285
Malaysia	-0.049	0.032	0.000	0.001	-0.001	0.01	285
Thailand	-0.701	0.103	0.001	0.002	0.006	0.05	285
<b>Europe</b>							
Czech Republic	0.648	0.209	-0.001	0.002	-0.006	0.06	285
Poland	-0.108	-0.049	0.001	0.000	-0.007	0.05	285
Russia	-0.174	-0.202	0.003	-0.014	0.009	0.10	285
<b>Latin America</b>							
Argentina	0.225	0.127	0.022	-0.074	0.089	0.05	285
Brazil	-0.066	-0.036	0.002	0.008	-0.006	0.03	285
Mexico	-0.068	0.051	0.001	0.000	-0.008	0.04	285
<b>Advanced Economies</b>							
<b>Asia</b>							
Australia	-0.495	-0.060	-0.002	0.007	-0.001	0.12	285
Japan	-0.001	-0.020	-0.001	0.002	-0.003	0.04	285
<b>Europe</b>							
<b>Euro Area</b>							
Austria	-0.090	-0.078	-0.001	0.004	0.000	0.05	285
Belgium	-0.016	-0.025	-0.001	0.004	-0.001	0.02	285
Finland	0.099	-0.038	-0.002	0.004	0.000	0.11	285
France	-0.008	-0.038	0.000	0.005	0.000	0.06	285
Germany	-0.016	-0.056	-0.002	0.005	-0.001	0.14	285
Greece	-2.372	-0.076	0.027	0.018	-0.016	0.04	285
Ireland	0.020	0.097	0.000	0.002	0.006	0.02	285
Italy	-0.111	-0.226	0.002	0.005	0.002	0.07	285
Netherlands	0.002	-0.031	-0.002	0.004	-0.001	0.10	285
Portugal	-4.504	0.053	0.000	0.001	0.001	0.00	285
Spain	-0.179	-0.166	0.000	0.005	-0.004	0.04	285
Denmark	-0.170	0.040	-0.002	0.005	-0.001	0.13	285
Norway	-0.195	-0.119	-0.002	0.004	0.001	0.09	285
Sweden	0.075	-0.077	-0.003	0.006	-0.002	0.16	285
Switzerland	0.224	-0.051	-0.001	0.003	0.000	0.09	285
United Kingdom	-0.021	-0.080	-0.002	0.007	-0.002	0.15	285
<b>North America</b>							
Canada	-0.022	-0.075	-0.002	0.005	-0.002	0.16	285
US	-0.001	-0.117	-0.003	0.006	-0.001	0.15	285

Sources: EPFR, Bloomberg, and staff estimates.

**Legend**

The significance of the variable increases the darker the color. Dark blue indicates a significance level of 1 percent, medium blue of 5 percent, light blue of 10 percent, and grey none.

**Table 11. Impact of UMP-related Equity Funds Flows on Equity Prices**

	UMP_Equity	Lagged dependent variable	VIX	Oil prices	Non-energy commodity prices	R <sup>2</sup>	Number of observations
<b>Emerging Markets</b>							
<b>Africa</b>							
South Africa	-0.245	-0.068	-0.094	0.146	0.200	0.45	285
<b>Asia</b>							
China	0.166	0.006	-0.067	0.057	0.085	0.09	285
India	0.932	-0.013	-0.096	0.128	0.061	0.21	285
Indonesia	2.771	-0.045	-0.081	0.145	0.057	0.19	285
South Korea	0.362	-0.033	-0.102	0.091	-0.041	0.18	285
Malaysia	1.180	0.115	-0.057	0.075	-0.027	0.21	285
Thailand	2.674	-0.027	-0.090	0.116	0.029	0.21	285
<b>Europe</b>							
Czech Republic	11.507	0.029	-0.126	0.247	-0.012	0.37	285
Poland	2.782	-0.018	-0.115	0.199	0.019	0.36	285
Russia	0.173	-0.083	-0.180	0.274	0.225	0.36	285
<b>Latin America</b>							
Argentina	27.119	0.152	-0.158	0.266	0.266	0.46	285
Brazil	0.294	-0.018	-0.142	0.254	0.089	0.49	285
Mexico	-0.119	-0.034	-0.105	0.122	0.151	0.42	285
<b>Advanced Economies</b>							
<b>Asia</b>							
Australia	0.973	-0.006	-0.097	0.125	-0.038	0.32	285
Japan	0.173	0.008	-0.117	0.135	0.017	0.27	285
<b>Europe</b>							
<b>Euro Area</b>							
Austria	8.691	-0.009	-0.178	0.226	0.089	0.46	285
Belgium	3.442	0.041	-0.144	0.082	0.112	0.44	285
Finland	3.640	-0.079	-0.154	0.098	0.144	0.45	285
France	0.340	-0.009	-0.170	0.128	0.048	0.54	285
Germany	-0.010	0.010	-0.159	0.116	0.103	0.47	285
Greece	0.832	0.038	-0.154	0.180	0.020	0.22	285
Ireland	12.767	-0.029	-0.160	0.190	-0.151	0.34	285
Italy	1.356	0.010	-0.185	0.133	0.079	0.46	285
Netherlands	0.958	0.040	-0.148	0.136	0.079	0.48	285
Portugal	5.460	-0.057	-0.132	0.072	0.093	0.33	285
Spain	1.313	-0.014	-0.179	0.123	-0.035	0.43	285
Denmark	7.602	-0.036	-0.117	0.138	0.009	0.33	285
Norway	1.610	-0.055	-0.149	0.254	0.098	0.50	285
Sweden	0.742	-0.083	-0.150	0.063	0.016	0.41	285
Switzerland		-0.013	-0.126	0.082	-0.064	0.40	285
United Kingdom	0.137	0.065	-0.134	0.097	0.083	0.55	285
<b>North America</b>							
Canada	0.174	0.009	-0.091	0.189	0.249	0.65	285
US	0.001	0.086	-0.148	0.143	0.070	0.65	285

Sources: EPFR, Bloomberg, and staff estimates.

**Legend**

The significance of the variable increases the darker the color. Dark blue indicates a significance level of 1 percent, medium blue of 5 percent, light blue of 10 percent, and grey none.

**Table 12. Impact of Surprises on 10-year Bond Yields**

1-year Bond Yields Response to UMP Announcements  
*bps, 2-day cumulative*

	U.S.						UK			EA			Japan			
	LSAP1A	LSAP1B	LSAP2	TWIST	LSAP3	Tapering	Forward Guidance	APP1	APP2	FLS	OMT	Speech	Rate Cut	Forward Guidance	LSAP	QQME
Advanced Economies																
US	-8.7	-11.6	-4.4	-14.2		8.3		4.4		-1.3		13.7	11.6	2.0		
UK	-15.7															
Japan	-4.2				21.7				11.4							
Germany	-6.3	-5.7	-2.7	-6.8	-7.4		3.8	3.5		-2.3	0.5	8.7			-2.4	
Euro Area																
Core	-4.8	-4.7	-2.2	-3.8	-7.0	3.3		1.9							-0.5	-4.1
Periphery	-3.8	-3.8	-1.6	-3.3	-13.9	6.9		-1.4	3.7		-2.9	-15.2			-0.5	-6.3
EUR Safe Havens	-4.2	-3.2	-1.9	-5.4	-6.4	6.1		2.6		-0.8		9.2	3.2		-0.4	-5.6
Inflation Targeters	-1.8	-2.6	-2.4	-3.2				2.2		-3.0		5.0				
Emerging Market																
China and India	-2.9	-1.9	-0.7			3.1			-2.6		0.4				-0.3	-3.7
Emerging Asia																
Emerging Europe	-2.2		-1.4						-0.6							
Latin America	-2.5					7.9	7.6		-8.2		1.6				-0.6	-6.2
Other	-9.3	-9.6		5.8			9.7					14.7				
Other	-6.0	-5.6	-2.2	6.0			8.1								-4.3	-9.3

Sources: Bloomberg, Datastream, and staff estimates.

Note: For a detailed list of announcement dates, see the Appendix. Core EA comprises: Austria, Belgium, Finland, France, and Netherlands; Periphery EA comprises: Greece, Ireland, Italy, Spain, and Portugal; European Safe Havens comprise Denmark and Switzerland; Inflation Targeters comprise Australia, Canada, New Zealand, Norway, and Sweden; Latin America comprises Brazil and Mexico; Asia comprises Indonesia, Malaysia, South Korea, and Thailand; Europe comprises Czech Republic and Poland; Other EMs comprise Russia, South Africa, and Turkey. Only significant responses are reported.

**Table 13. Impact of Surprises on Stock Prices**  
(rate of return)

Stock Prices Response to UMP Announcements  
*percentage points, 2-day cumulative*

	U.S.						UK			EA			Japan			
	LSAP1A	LSAP1B	LSAP2	TWIST	LSAP3	Tapering	Forward Guidance	APP1	APP2	FLS	OMT	Speech	Rate Cut	Forward Guidance	LSAP	QQME
Advanced Economies																
US	-1.5	-2.2		-3.4			5.1		1.4			3.3	1.8	-0.6	-0.6	
UK					-3.8											
Japan	-1.1		-0.5	-3.4	-3.2	-2.6	3.1	0.8		-0.6		5.1				
Germany	-1.3	-1.0	-0.4	-4.5			3.8	0.7	2.3	-0.4		3.5	2.4	-0.9	-1.3	
Euro Area																
Core	-0.7		-0.3	-3.2	-2.2	-1.4	1.6			-0.4		2.6		1.2	-0.3	
Periphery	-0.7			-3.5	-2.6	-1.6	1.4			-0.3		2.2		0.9	-0.1	
EUR Safe Havens	-1.4	-1.5	-0.3	-2.5		-1.2	3.9	0.5		-0.2		1.7		0.9	-0.2	
Inflation Targeters	-1.2	-1.3	-0.4	-2.2			2.9					2.6		1.8	-0.3	
Emerging Market																
China and India	-0.7	-0.6		-1.7		-1.3	2.4			-0.4		1.7		0.6	-0.2	
Emerging Asia					-2.8						0.2					
Emerging Europe	-0.8	-1.0		-2.5		-3.2	2.6		1.4	-0.4		1.6		1.3	-0.4	
Latin America	-0.8						1.5	0.5		-0.3					-0.1	
Other	-1.4	-1.9		-3.3			4.5			-0.6		5.4				
Other	-0.9			-2.6	-1.8	-2.2	3.6			-0.5		1.4		0.9	-0.3	

Sources: Bloomberg, Datastream, and staff estimates.

Notes: For a detailed list of announce dates, see the Appendix. Core EA comprises: Austria, Belgium, Finland, France, and Netherlands; Periphery EA comprises: Greece, Ireland, Italy, Spain, and Portugal; European Safe Havens comprise Denmark and Switzerland; Inflation Targeters comprise Australia, Canada, New Zealand, Norway, and Sweden; Latin America comprises Brazil and Mexico; Asia comprises Indonesia, Malaysia, South Korea, and Thailand; Europe comprises Czech Republic and Poland; Other EMs comprise Russia, South Africa, and Turkey. Only significant responses are reported.

**Table 14. Impact of Surprises on the Relevant Bilateral FX Rate**  
(rate of return)

Cross FX Rates Response to Surprises of UMP Announcements  
*percentage points, 2-day cumulative*

	U.S.							UK			EA			Japan		
	LSAP1A	LSAP1B	LSAP2	TWIST	LSAP3	Tapering	Forward Guidance	APP1	APP2	FLS	OMT	Speech	Rate Cut	Forward Guidance	LSAP	QQME
Advanced Economies																
US								0.3		-0.7	1.0	1.7				-1.5
UK	0.9	0.4	-0.1	1.4	0.8								-0.6			-1.5
Japan	-0.4	-0.8	-0.3			-1.3	-0.9	0.3		-0.6		2.5	1.1			
Germany				1.1	1.7					-0.2						-2.0
Euro Area																
Core			-0.3	1.1	1.7		-2.6			-0.2						
Periphery			-0.3	1.1	1.7		-2.6			-0.2						
EUR Safe Havens	0.2			2.3	0.8		-2.2			-0.3				0.4		-1.5
Inflation Targeters			-0.3	1.2	1.5		-2.8			-0.2						-1.9
Emerging Market																
China and India	0.2		-0.8	1.1	1.2		-1.2			-0.4				0.2		-1.7
Emerging Asia	0.9	0.9		0.2	0.4		-0.3	0.3		-0.6		1.2				-1.4
Emerging Europe	0.6		-0.4	0.6	0.9	0.4	-0.5			-0.5		1.2				-1.7
Latin America	0.6	0.7		1.8	1.9		-3.5					-0.7		0.4	0.2	-2.2
Other	0.6	0.7		2.7	2.1	0.9	-2.1	-0.5		-0.5	0.2			0.3	0.3	-2.2
		-0.9		1.8	2.5					-0.6			-0.9	0.4	0.3	-2.4

Sources: Bloomberg, Datastream, and staff estimates.

Notes: For a detailed list of announcement dates, see the Appendix. Core EA comprises: Austria, Belgium, Finland, France, and Netherlands; Periphery EA comprises: Greece, Ireland, Italy, Spain, and Portugal; European Safe Havens comprise Denmark and Switzerland; Inflation Targeters comprise Australia, Canada, New Zealand, Norway, and Sweden; Latin America comprises Brazil and Mexico; Asia comprises Indonesia, Malaysia, South Korea, and Thailand; Europe comprises Czech Republic and Poland; Other EMs comprise Russia, South Africa, and Turkey. Only significant responses are reported.

**Table 15. Surprise Effect of UMP Announcements on Forward LIBOR Rate**

Forward Libor Responses to UMP announcements  
*bps, cumulative*

	U.S.							UK			EA			Japan		
	LSAP1A	LSAP1B	LSAP2	TWIST	LSAP3	Tapering	Forward Guidance	APP1	APP2	FLS	OMT	Speech	Rate Cut	Forward Guidance	LSAP	QQME
United States	<u>-5.5</u>	<u>-9.0</u>	-2.4	1.9	<u>5.1</u>	0.5	<u>-16.7</u>	0.5	-1.3	-1.8	1.5	-0.5	-0.5	-0.8	-1.0	-1.5
Japan	0.8	-0.3	0.3	0.5	1.2	-0.5	-1.4	-0.3	-0.5	-0.3	0.0	0.5	-0.5	-0.5	-0.5	3.0
United Kingdom	<u>-2.7</u>	<u>-2.6</u>	-0.5	0.3	<u>-3.0</u>	<u>-3.1</u>	1.8	2.6	<u>-5.1</u>	<u>-5.4</u>	1.9	2.9	<u>-3.1</u>	2.9	-0.7	-1.1
Euro Area	<u>-4.8</u>	-0.9	<u>-1.1</u>	0.5	-1.0	<u>-2.5</u>	0.4	<u>-3.8</u>	-2.2	-1.4	0.5	0.5	<u>-4.0</u>	0.3	-1.5	2.0

Figures in italicized underlined font indicate significance at 5%.

Sources: Bloomberg, Datastream, and staff estimates.

Note: For a detailed list of announcement dates, see the Appendix.

Appendix Table 1. Selected Indicators

Country	Exposure				Resilience													
	Sensitivity to a change in US long term bond yield 1/	Change in EM bond yields on US tapering 2/	EM Inflows after US tapering (z-score) 3/	Credit ratings 4/	Domestic market conditions			Dependence on foreign funding			Policy room							
					Market Capitalization (percent of GDP) 5/	Turn-over ratios (percent market capitalization) 5/	Size of pension, mutual funds and insurance companies (percent of external debt) 6/	Foreign portfolio equity liabilities (percent of GDP) 7/	External Debt (2012) 8/		Fiscal Policy Room		Monetary Policy Room		Room for exchange rate adjustment (percent) 12/		Trade balance (percent of GDP) 13/	FX reserves months of imports) 14/
Australia	<b>0.54</b>	35.4	-4.04	AAA	84.60	84.65	...	23.85	...	...	0.7	-0.88	-0.05	5~15	-1.09	1.39	5.6	1.8
Brazil	<b>0.53</b>	24.1	-2.15	BBB	54.60	67.88	101.32	15.86	14.06	10.94	-4.2	-0.04	0.00	10~15	-0.96	14.29	10.4	3.6
Canada	<b>0.56</b>	23.3	-0.46	AAA	110.69	61.58	...	23.44	...	...	2.3	-1.73	-1.24	5~15	-1.99	1.14	4.7	0.6
China	-0.01	6.8	-1.97	AA-	44.94	164.44	144.98	3.19	8.96	72.79	0.0	...	-5.16	-10~-5	2.82	19.73	6.3	1.0
India	-0.03	12.2	-1.67	BBB-	68.60	54.63	...	7.00	20.90	27.13	6.7	...	-0.91	-5~5	-7.63	5.42	6.9	3.1
Indonesia	<b>1.10</b>	36.4	-2.05	BB+	45.19	23.30	5.53	10.55	28.59	17.25	1.7	1.41	-0.11	-5~5	-0.24	5.92	11.9	2.0
Korea	<b>0.26</b>	21.0	-1.42	AA-	104.50	139.22	85.02	32.17	36.60	26.16	-4.6	-2.30	-1.40	-8~-2	3.63	6.11	8.8	0.7
Mexico	<b>0.30</b>	57.8	-1.65	BBB+	44.60	25.31	37.73	14.59	29.34	16.92	1.2	-0.14	-0.44	-5~5	-1.21	4.90	10.1	2.4
Poland	0.09	42.8	-1.95	A	36.29	42.56	19.39	7.57	74.35	16.99	2.4	-1.92	-1.73	-5~5	-0.14	5.09	8.6	5.0
Russia	-0.26	45.9	-1.69	BBB+	43.41	87.64	...	9.58	28.61	9.10	-0.5	0.87	-0.03	-5~5	7.25	13.13	12.4	6.4
South Africa	<b>0.19</b>	23.2	-1.87	BBB+	159.33	54.93	267.33	25.85	35.78	16.54	2.3	-0.15	-1.17	10~20	-3.05	4.39	7.3	4.4
Thailand	<b>0.62</b>	20.1	-2.37	BBB+	104.77	70.44	31.77	20.12	45.59	20.57	1.2	-0.60	-0.09	-5~5	1.40	7.58	10.5	2.7
Turkey	<b>0.66</b>	95.1	-1.48	BBB-	39.12	136.51	4.93	8.95	42.70	36.89	-1.4	-0.36	-0.43	10~20	-5.38	6.62	12.0	2.7

1/ Based on regression of non-UWP country 10-year bond yields on U.S. 10-year bond yields. The regression was run in changes over two-day intervals immediately following U.S. FOMC announcements between January 1, 2003 and May 20, 2013.

Bolded numbers indicate statistically significant coefficients.

2/ Cumulative change in EM bond yields using 2-day windows on 05/22/2013 and 06/19/2013.

3/ Z-scores of average flows (equity and bond) in the month after tapering announcement on 5/22/2013 relative to flows since 2009. A z-score represents the deviation from the long-term average expressed in the number of standard deviations. Source: EPFR data and staff calculation.

4/ Lowest between Moody's and S&P ratings for local currency debt as of mid-August 2013 and expressed in S&P ratings. Source: Bloomberg.

5/ Based on 2012 data. Source: World Bank WDI.

6/ Market size of domestic investors that could provide funding in case of a sudden stop. Data as of end-December 2011 for South Africa; end-Jan 2012 for Brazil; end-March 2012 for Indonesia, Korea, Poland; end-April 2012 for Turkey; end-May 2012 for Mexico; and end-2009 for China and Thailand. Source: GFSR April 2012.

7/ Foreign ownership of domestic portfolio equities as a percent of GDP. Based on 2012 data, except for Indonesia, South Africa and Thailand, which use data from 2011. Sources: WEO July 2013 and IFS.

8/ Total Gross External Debt in 2012. Source: WEO July 2013.

9/ The higher the indicated primary balance adjustment, the greater the degree of fiscal tightening needed to reduce the debt-to-GDP ratio to 60 percent for AEs and 40 percent for EMs in 2030, and thus the less available fiscal space. Source: Fiscal Monitor, April 2013, Statistical Table 13.

10/ This measure is calculated as the differences between WEO projected CPI inflation in 2013 and inflation target (upper bound is used if central bank targets at a range). For South Africa, core inflation target is used. Source: WEO July 2013.

11/ Source: WEO July 2013.

12/ Differences between REER and those consistent with medium-term fundamentals and desirable policies. Assessments prepared in May 2013. Source: 2013 External Stability Report, IMF 2013d.

13/ Based on 2012 data. Source: WEO July 2013.

14/ Number of months of imports covered by FX reserves. Based on 2012 data. Source: Staff estimates and IFS.

15/ Based on 2012 data from the Financial Soundness Indicators (FSI), except for Thailand, which is based on 2012 data from the Bank of Thailand.

**Appendix Table 2. Selected Recent Unconventional Monetary Policies**

Country	Date	Program	Description
<b>Forward Guidance</b>			
U.S.	12/16/2008		The FOMC "anticipates...exceptionally low levels of the federal funds rate for some time."
U.S.	3/18/2009		The FOMC "anticipates...exceptionally low levels of the federal funds rate for an extended period."*
U.S.	9/13/2012		The FOMC "will continue to maintain interest rates extremely low until at least mid-2015."*
U.S.	12/12/2012		The FOMC "decided to keep the target range for the federal funds rate at 0 to 1/4 percent and currently anticipates that this exceptionally low range for the federal funds rate will be appropriate at least as long as the unemployment rate remains above 6-1/2 percent, inflation between one and two years ahead is projected to be no more than a half percentage point above the Committee's two percent longer-run goal, and longer-term inflation expectations continue to be well anchored."
Japan	10/5/2010		The bank "will maintain the virtually zero interest rate policy until it judges, on the basis of the understanding of medium-to long-term price stability."
Japan	1/22/2013		The bank announces an inflation target of two percent in addition to open-ended asset purchases.*
Japan	4/4/2013		The bank announces its intention to meet its 2 percent price stability target over about 2 years.
<b>Bond Purchases</b>			
U.S.	3/18/2009	LSAP1	The FOMC announces it will purchase longer-term Treasury securities (US\$300 billion) over the next six months.* It had expressed intention to do so earlier on 1/28/2009 and Chairman Bernanke had expressed intention on 12/1/2008. On 8/12/2009 the FOMC decided to "gradually slow the pace" of Treasury purchases and removed "up to" language with reference to Treasury purchase limit.
U.S.	11/3/2010	LSAP2	The FOMC "intends to purchase a further US\$600 billion of longer term Treasury securities by the end of the second quarter of 2011, a pace of about US\$75 billion per month." The FOMC expressed intention of purchasing longer-term Treasuries on 8/10/2010 and 9/21/2010. Chairman Bernanke expressed intention on 8/27/2010.
U.S.	9/21/2011	MEP	The FOMC "intends to purchase, by the end of June 2012, US\$400 billion of Treasury securities with remaining maturities of six years to 30 years and to sell an equal amount of Treasury securities with remaining maturities of three years or less." On 6/20/2012 the FOMC "decided to continue throughout the end of the year its program to extend the average maturities of three years or less."

**Appendix Table 2. Selected Recent Unconventional Monetary Policies (continued)**

Country	Date	Program	Description
U.S.	12/12/12	LSAP3	The FOMC announced that in addition to its existing MBS purchase program, it would purchase longer-term Treasury securities initially at a pace of US\$45 billion per month. Open ended.
U.K.	3/5/2009	APP1	The MPC announces it will purchase £75 billion of assets over three months. Conventional bonds likely to constitute the majority of purchases, restricted to bonds with residual maturity between five and 25 years. Facility expanded to £125 billion on 5/7/2009, to £175 billion on 8/6/2009 (and to bonds with residual maturity of three+ years), and to £200 billion on 11/05/2009. Previously, on 1/19/2009 the chancellor of the Exchequer announced that the BoE would set up an asset purchase program. On 1/30/2009 the Asset Purchase Facility was established.
U.K.	10/6/2011	APP2	The MPC announces it will expand asset purchases by £75 billion. An additional expansion by £50 billion is announced on 02/09/2012, and a further expansion by £50 billion on 7/05/2012.
Japan	10/5/2010	CME	Announcement of purchases of Japanese government bonds (JGBs), commercial paper, corporate bonds, exchange traded funds (ETF), Japanese real estate investment trusts (J-REITS). Total purchases planned by end 2013: JPY 76 trillion. Expanded several times /2.*
Japan	4/4/2013	QQME	Announcement of purchases of JGBs, ETFs and J-REITs with the goal of increasing the monetary base by Y60 to Y70 trillion annually, increasing the average maturity of JGBs held from three to seven years and meeting the 2 percent inflation target in about two years. *
Targeted Liquidity Provision and Private Asset Purchases			
U.S.	11/25/2008	LSAP1	The Federal Reserve will purchase up to US\$100 billion in agency debt and up to US\$500 billion in MBS. The Fed announces the creation of the TALF. The FOMC expands the program on 3/18/2009 announcing it will purchase US\$750 billion in MBS and US\$100 billion in agency debt over the next six months. On 9/23/2009 the FOMC decided to “gradually slow the pace” of MBS purchases and removed “up to” language with reference to MBS purchases limit. On 11/4/2009 the FOMC announces it “will purchase...about US\$175 billion of agency debt” and removed “up to” language with reference to agency debt limit.
U.S.	9/13/2012	LSAP3	The FOMC will purchase US\$40 billion MBS a month - open-ended.* Chairman Bernanke had expressed the intention on 8/31/2012.
U.K.	7/12/2012	FLS	FLS is announced. Banks and building societies that increase lending to U.K. households and businesses will be able to borrow more in the FLS, and do so at lower cost than those that scale back lending.
Japan	5/21/2010		Introduction of the fund-provisioning measure to support strengthening the foundations for economic growth (loan support program).



**Appendix Table 2. Selected Recent Unconventional Monetary Policies (concluded)**

Japan	10/5/2010	CME	Announcement of purchases of Japanese government bonds, commercial paper, corporate bonds, ETFs, Japanese real estate investment trusts (J-REITS). Total purchases planned by end 2013: Y 76 trillion. Expanded several times /2.*
Japan	10/30/2012		Introduction of fund-provisioning measure to stimulate bank lending.
Japan	4/4/2013	QQME	Announcement of purchases of JGBs, ETFs and J-REITs with the goal of increasing the monetary base by Y 60 to Y 70 trillion annually, increasing the average maturity of JGBs held from three to seven years and meeting the 2 percent inflation target in about two years. *
Euro Area	8/9/2007		ECB provides liquidity to permit orderly functioning of the money market. From August 9–14 it injects €335 billion into the euro area banking system
Euro Area	12/12/2007	FX swaps	ECB takes joint action with the Federal Reserve by offering U.S. dollar funding to eurosystem counterparties. Extended several times on future dates.
Euro Area	5/9/2010	SMP	Securities Market Program (SMP) launched to ensure depth and liquidity in dysfunctional market segments (sovereign paper).
<b>Country</b>	<b>Date</b>	<b>Program</b>	<b>Description</b>
Euro Area	12/08/2011 2/28/2012	LTRO	ECB announced two three-year LTROs, reduced the reserve ratio from two percent to one percent and expanded collateral availability (additional performing claims-NCB discretion)
Euro Area	9/6/2012	OMT	Technical features of OMT. "A necessary condition for OMT transactions is strict and effective conditionality attached to an appropriate European Financial Stability Facility/European Stability Mechanism (EFSF/ESM) program." Mario Draghi expressed intention on 7/26/2012. The ECB first announced OMT on 8/2/2012.

Source: Country authorities.

Note: \* Event is included in multiple entries.

1/ Announcing an inflation target is more than just committing to temporarily loose policy in the future, instead it provides information about a permanent change in monetary policy.

2/ Dates include 3/14/2011, 8/4/2011, 10/27/2011, 2/14/2012, 4/27/2012, 7/12/2012, 9/19/2012, 10/30/2012, and 12/20/2012, 1/22/2013.

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