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Mahir Binici
Michael M. Hutchison

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ABSTRACT

This paper evaluates the impact of tapering "news" announcements by Fed senior policy makers on financial markets in emerging economies. We apply a panel framework using daily data, and find that emerging market asset prices respond most to statements by Fed Chairman Bernanke, and much less to other Fed officials. We group emerging markets into those with "robust" fundamentals (current account surpluses, high international reserves and low external debt) and those with "fragile" fundamentals and, intriguingly, find that the stronger group was more adversely exposed to tapering news than the weaker group. News of tapering coming from Chairman Bernanke is associated with much larger exchange rate depreciation, drops in the stock market, and increases in sovereign CDS spreads of the robust group compared with the fragile group. A possible interpretation is that tapering news had less impact on countries that received fewer inflows of funds in the first instance during the quantitative years and had less to lose in terms of repatriation of capital and reversal of carry-trade activities.

Joshua Aizenman
Economics and SIR
USC
University Park
Los Angeles, CA 90089-0043
and NBER
aizenman@usc.edu

Mahir Binici
Central Bank of Turkey
Istiklal Cad. No : 10 Ulus
06100 Ankara
Turkey
mahir.binici@tcmb.gov.tr

Michael M. Hutchison
Department of Economics
E2
University of California
Santa Cruz, CA 95064
hutch@ucsc.edu

1. Introduction

The quantitative easing (QE) policies of the U.S. Federal Reserve in the years following the crisis of 2008-9 included monthly securities purchases of long-term Treasury Bonds and Mortgage Backed Securities totaling $85 billion in 2013. The cumulative outcome of these policies has been the unprecedented increase of the monetary base, mitigating the deflationary pressure of the crisis. The resultant lower interest rates and flattened yield curve improved financial conditions and helped stimulate real economic activity, yet the QE policy raised pertinent questions regarding the timing and the nature of the exit strategy [Williams (2011, 2012)]. These issues came to fore in 2013, with vigorous and intensifying debate among policy makers and market participants about the exit strategy from the massive monetary stimulus. The growing frequency of public statements by the Fed's governors and presidents, combined with occasional press releases, have been the focus of the financial media, changing expectations and moving market prices. This process calumniated on December 18, 2013, when the Fed decided at the FOMC meeting (as announced in the public statement) to taper its quantitative easing policy by $10 billion per month, to $75 billion. Chairman Bernanke also projected the program to wind down steadily through 2014 and conclude by year-end, assuming the economy remains healthy. On January 29, 2014 the Fed announced at the end of the FOMC meeting that it would further "taper" quantitative easing by another $10 billion per month to $65 billion.

An important feature of quantitative easing and unprecedentedly low U.S. interest rates is that it led to large and disruptive short-term capital inflows to a number of emerging markets, which in turn led several to impose capital controls, such as Brazil, Indonesia, South Korea, and others (Ahmed and Zlate, 2013). Quantitative easing led the U.S. dollar to be the funding currency in large-scale carry trade activity with Emerging Markets as the target currencies. The concern with tapering is the flipside: potentially disruptive large-scale capital outflows from Emerging Markets as carry-trade activity is unwound in expectation of tapering (and, eventually, reduction in the Fed balance sheet through sales of assets, not just reduction in the pace of purchases) and hints at future interest rate increases. Large capital outflows could create disruptions in financial markets, and eventually real economic activity, in Emerging Markets.

This paper evaluates whether tapering announcements has disrupted financial markets in emerging economies. We investigate the impact of tapering "news" announcements by Fed senior policy makers on financial asset prices in Emerging Markets. The Emerging Markets financial asset prices of interest are national stock markets, exchange rates, and CDS spreads. These reflect a broad spectrum of the potential effects of tapering, where we would expect greater likelihood of tapering (continued quantitative easing), and hence capital outflows (inflows), from Emerging Markets, to cause a fall in equity markets, depreciation of exchange rates and an increase in CDS spreads (reflecting greater uncertainty and risk in sovereign bond markets). In terms of Fed "news," we focus on statements from Federal Reserve Chairman Bernanke, Federal Reserve Board Governors and Federal Reserve Bank Presidents, as well as FOMC statements and minutes. Our presumption is that it is important to differentiate between announcements/statements by the Chairman, as the public face and most important Fed policymaker, and other Fed policymakers (Governors and Presidents).

We employ daily data during Nov. 2012- Oct. 2013. Statements about the likelihood of future tapering, or scaling back the large-scale asset purchase program (LSAP), began to emerge in late 2012, marking the beginning of our sample period. However, during this period there we also frequent and forceful statements by Fed officials about the need to continue quantitative easing, so these statements were also included as "news" in our investigation both to address issues of symmetry and judge market impacts.

The methodology of the paper is a quasi-event study, akin to Dooley and Hutchison (2009), tracing the impact of evolving narrative about the expectation of future tapering, as revealed to the public through the news media, on key emerging market prices. We use a panel fixed effect framework using daily data with a variety of models to evaluate the impact of "news" on the three assets prices (stock market, exchange rate and CDS spreads). However, we do not expect the market responses to tapering "news" to be identical across emerging markets but rather to depend on their relative strength in international markets. In particular, we exploit the heterogeneity among the emerging markets, evaluating the association between market prices and key characteristics associated with "fragility" or "robustness" of a country, where these characteristics are defined (below) by their current account, international reserve and foreign indebtedness positions.

Previewing results, we find that Emerging Market asset prices respond most to statements by Fed Chairman Bernanke, and much less to the frequent, divergent and sometimes inconsistent statements by other Fed officials. This finding is consistent with the power of the Chairman to set and impact the agenda, and with the advantage of more frugal and clear communication. We group Emerging Markets into those with "robust" fundamentals (11 countries) and those with "fragile" fundamentals (16 countries) and, intriguingly, find that stronger countries, on average, were more adversely exposed to the tapering news than the weaker countries. News of higher probability of tapering coming from Chairman Bernanke are associated with large drop of the stock market, and increase of the sovereign spreads of the stronger group, yet with insignificant impact of the tapering news on spreads and stock markets in the weaker group. The exchange rate depreciated in both groups following tapering news from Chairman Bernanke, yet the depreciations of the stronger group were three times as large as the weaker group.

A possible interpretation of these findings is that countries with weaker fundamentals were less exposed to the inflows triggered by quantitative easing, in line with the conjecture that being closer to financial autarky provides deeper insulation from financial news. The flipside is that tapering news had less impact of the countries that fewer inflows of funds in the first instance during the quantitative easing years. Yet, these findings are also consistent with a less sanguine interpretation, reflecting financial markets initial inattention to tail risks, overlooking the vulnerability of the weaker emerging markets to the adverse implications of higher future global interest rates. Indeed, in the last quarter of 2013, financial markets re-focused attention on the fragile emerging markets, with depressed financial asset prices of "the Fragile Five," -- Brazil, India, Indonesia, South Africa, Turkey, a sub group of the weaker emerging markets.[1]

The methodology of our paper complements Eichengreen and Gupta (2014), who used data for exchange rates, foreign reserves and equity prices between April and August 2013 to analyze who was hit and why. They concluded that better fundamentals did not provide insulation. Instead, countries with larger markets experienced more pressure on the exchange rate, foreign reserves and equity prices. Our focus on the event methodology allows us to trace the immediate impact effect of the coming news on expectation of adjustment, as reflected in the changes of key prices triggered by the news. Our finding that the stronger emerging markets

[1] The market inattention to tail risks was vividly illustrated by the Euro crisis, where the pre-crisis sovereign spreads of Greece, Portugal and Spain were comparable to that of Germany and other Eurozone core countries (Aizenman, Hutchison, and Jinjarak, 2013). See also Aizenman, Binici, and Hutchison (2013) for overview of other issues in the pricing of risk during the euro crisis.

were hammered more than the weaker once immediately after the tapering news suggests a possible detachment of financial markets' reaction from the longer run implications of tapering on the weaker emerging markets. While there is no decoupling of emerging markets from US Fed policies, there is systematic heterogeneity in the burden of adjustment. Prices of stronger emerging markets may adjust more swiftly, possibly allowing smoother adjustment of the real economy to the challenges associated with higher future interest rates.

The next section presents the data and methodology of the study. Section 3 presents the results. Section 4 concludes.

2. Data and Methodology

2.1 Data

Our objective is to evaluate the transmission of U.S. tapering "news" to financial markets in emerging markets. In undertaking this analysis, we consider both announcements associated with support (or actions) of quantitative easing as well as tapering. During the period of time under investigation, November 27, 2012 through October 3, 2013, there were numerous statements in support of both policies by Chairman Bernanke, Federal Reserve Governors, Federal Reserve Bank Presidents and FOMC statement following meetings, and FOMC minutes from past meetings. This allows us to evaluate the symmetry of the effects of the announcements, both for QE and Tapering, but also for different sources of the statements. In particular, we focus on six types of announcements from the Federal Reserve: statements by Fed Chairman Bernanke, either in support of further quantitative easing (QE) or tapering (T); release of statements following the FOMC meetings either supporting further QE or T; and statements by Governors of the Federal Reserve System (other than Bernanke) or by Presidents of the Federal Reserve Banks either supporting QE or T.

To gather this information, we conducted two sets of news searches on Bloomberg. . The first search was for the keywords "QE Federal." Additionally, to focus on the tapering aspect of the QE announcements another search was performed for the keywords "Federal Reserve Bank of" "QE" and "Fed Taper". A filter was applied to select "News" for both searches. To verify whether the announcement and speech "news" were coded consistently with how they were perceived by the markets in the U.S. (not emerging markets), we examined articles and other publications from the Factiva database. We utilized the date and topic filtering available in the database to solicit descriptions of the perception as well as the corresponding market reactions of the announcement/speech. We closely examined each of the original Bloomberg coding for announcements to determine whether they matched the perceptions found in the Factiva publications. There were many more announcements/statements/speeches on these topics than were coded. In order to be coded as either supporting further (or continuing) QE or Tapering, the announcements were unambiguous.

Table 1 presents some summary statistics on our announcements as well as examples of announcement coding and the division between "tapering" and "quantitative easing." We found 3 cases (7 cases) where Chairman Bernanke clearly indicated tapering was a favored policy option (further or continuing QE was a favored policy option); 5 cases where the FOMC statements/minutes clearly favored QE (and none clearly favoring Tapering); and rough balance between Governors/Presidents speaking unambiguously in favor of QE (22 cases) or Tapering (26 cases).

We consider three main conduits through which these variables may affect emerging markets: daily changes in national stock markets (log first differences), daily changes in foreign exchange rates (log first differences), and daily changes in CDS spreads (in basis points). If tapering is expected to reduce financial flows to emerging markets, then we would expect national equity markets to fall, exchange rates to depreciate and (perhaps) CDS spreads to rise. We focus on 27 emerging markets, shown in Table 2. (The "fragile" and "robust" groups and statistics are explained below). Emerging markets were required to have stock market and CDS price data for the entire sample period to be included in the sample.

2.2 Methodology

We employ panel fixed effect estimation techniques to estimate the impact of U.S. Federal Reserve announcements on financial market prices in emerging markets. We estimate a panel data model of the following form:

$$(1) \quad \Delta P_{it} = \beta_0 + \beta_1 Ben\,T_t + \beta_2 Ben\,QE_t + \beta_3 GovPres\,T_t + \beta_4 GovPres\,QE_t + \beta_5 FOMC\,QE_t + \mu_i + \varepsilon_{it},$$

where ΔP_{it} is the log first difference in foreign exchange rates, national equity markets or the change in CDS spread for country i at time t. $Ben\,T_t$ ($Ben\,QE_t$) are statements supporting tapering (further quantitative easing) by Chairman Bernanke at time t; $GovPres\,T_t$

($GovPres\, QE_t$) are statements by Federal Reserve Board Governors or Federal Reserve Bank Presidents in support of tapering (further quantitative easing); and $FOMC\, QE_t$ are official statements following FOMC meetings supporting further quantitative easing. (No official FOMC statements supporting tapering were identified during this sample period).

We find no evidence of dynamic adjustment in asset price movements (log first differences in equity markets and exchange rates, first differences in CDS spreads) and considered all news events emanating from the U.S. as strictly exogenous for emerging markets. We therefore estimate the model as a static panel with country fixed effects. We report robust standard errors clustered with countries, and do not find any evidence of serial correlation in residuals. To take time differences between U.S. and Asian markets countries into account, all Fed announcements (independent variables) are lagged one day for countries including South Korea, Malaysia, Philippines, Thailand, China, Indonesia, India, Pakistan. For the rest of countries, news events are entered in the model contemporaneously.

Recognizing the substantial heterogeneity among the 26 emerging markets, we grouped the emerging markets according to three fragility/strength criteria: current account deficits or surpluses; low or high international reserves; and high or low external debts.[2] We estimated the effects of "news" on the full sample, as well as the two sub-groups ("robust" and "fragile"). As discussed in the introduction, we anticipate different reactions to news depending on the state of the emerging market economy.

3. Results

3.1 Full Sample Results

Table 3 reports the impact of the tapering and QE news on the stock market indices, exchange rates, and sovereign spreads for the full sample of 26 emerging markets during November 27, 2012-October 3, 2013. These regression results summarize the change of market prices in the 24 hour window following the news.

Tapering: Bernanke's tapering news was associated with significant drops in stock market indices and exchange rate depreciations, but no significant impact on sovereign spreads. This indicates the expectation of reduced capital inflows and carry-trade activity to emerging

[2] Low international reserve level is defined as a reserves/GDP ratio below 20%, and low external debt is defined an external debt/GDP ratio less than 34 %. Both cut-off points are the median values of their respective samples.

markets, with less investment in equity markets. Not surprisingly, tapering news doesn't seem to impact CDS spreads on sovereign debt. By contrast, numerous and frequently quite vigorous statements in support of tapering by Federal Reserve Bank Presidents had little discernible effect on emerging market financial prices—equities, exchange rates nor CDS spreads—during our sample period. (No tapering news as attributable to Fed Governors during this period, only Federal Reserve Bank Presidents). This may be because one of the Fed Presidents—Fisher of the Federal Reserve Bank of Dallas -- made many public statements advocating tapering (9 of our 26 events) that may have been discounted by financial markets due to their frequency and predictability of the message. (The other most vocal advocate for tapering was Philadelphia Federal Reserve Bank President Plosser with five news events during the sample period). No explicit and unambiguous news in support of tapering in FOMC announcements was coded during this period.

Quantitative Easing: Bernanke's QE news, symmetrically, was associated with strong exchange rate appreciation in Table 3. Exchange rates also significantly appreciated in response to QE news contained in FOMC statements and in announcements by Governors/Presidents, where the FOMC had the largest impact and Governors/Presidents least impact. The support for QE was broader than tapering, including Governors (Vice Chair Yellen and Governors Duke and Stein) and many Presidents. President Rosengren (Boston) and Bullard (St. Louis) spoke the most frequently (four times each) in support of continuing QE. In addition, consistent with the very strong impact of FOMC QE news exchange rate appreciation, these statements also had a large impact in pushing up stock market prices and reducing CDS spreads.

3.2 Differential Effects of Tapering

As discussed above, we expect tapering news to have different effects depending on the strength of a country's international "fundamentals." Full sample results, in turn, could mask differential effects due to group heterogeneity associated with disparate fundamentals. To address this issue, Table 4 reports the impact of the tapering and QE news on market prices, allowing comparison between countries having current account deficits/surpluses (Table 4A); low/high international reserves (Table 4B); and high/low external debts (Table 4C), respectively. (Table 2 presents the external positions of countries and the grouping between "robust" and "fragile" countries). We also group countries in terms of these fundamentals, robust and fragile, where the robust group are countries meeting at least two "strong" criteria [current account surplus, higher reserves, and low debt], and the fragile group meet at least two "weak" criteria [current account deficits, low reserves, and high debt]. The countries in each group are shown in Table 2 and Table 5 reports the regression results for these two groups.

This comparison reveals asymmetric and divergent patterns depending on whether the news is emanating from Bernanke's statements, as opposed to Governors/Presidents and the FOMC, and between the groups with robustness or fragile fundamentals. In particular, Bernanke's tapering news had much larger exchange rate *depreciation* effects on countries with (a) current account surpluses as opposed to deficits (three times larger, Table 4A), (b) high international reserves contrasted with low reserves (three times larger, Table 4B), and (c) low external debt rather than high debt (about half as much larger, Table 4C). The analysis of the two groups, fragile or robust shown in Table 5, also indicates that exchange rate depreciation is statistically significant in both cases at the time of Bernanke tapering announcements but more than three times larger in the robust group (0.37) compared with the fragile group (0.11).

By contrast, tapering announcements by Fed Governors or Presidents tapering news had little or no discernable impact on exchange rates in emerging markets, regardless of whether they were classified as robust/weak in fundamentals, had current account surpluses or deficits, had high/low international reserves or had low/high external debt. This is consistent with the full sample results.

Bernanke tapering news *increased* CDS spreads very substantially for countries with robust fundamentals (Table 5), and especially those with current account surpluses (Table 4A) and high international reserves (Table 4B), while having little or no effect on fragile countries (except for increasing spreads for those with high external debt positions). And, similar to the full sample results, tapering announcements by Fed Governors/Presidents had little or no effects on CDS spreads, regardless of group fundamentals.

Bernanke tapering news *lowered* equity market values in emerging markets for the full sample (Table 3), and in the countries with low external debt positions (Table 4C). And, similar to the full sample results, none of the group results based on fundamentals indicated that Governor/Presidents tapering announcements had any significant impact on stock markets.

Intriguingly, Tables 4 and 5 imply that Bernanke's tapering news hit hardest the countries typically associated with strong international positions – countries running current account surpluses, having high reserves and low debt- and our aggregate of robust countries. A possible interpretation is that fragile economics were less exposed to financial flows in search of higher yields during the earlier QE years; thereby they were expected to be less exposed to the immediate impact of the tapering news.

3.3 Differential Effects of Quantitative Easing

The effects of QE news also showed substantial variation depending on who made the statement and international position of the country. Bernanke's QE news was associated with strong *exchange rate appreciation* in the full sample (Table 3) as well as in both fragile and robust groups (Table 5) where the impact effects virtually identical (-0.13). An even more nuanced look indicates that depreciations were a more dominating characteristic of countries with weak current account positions and high external debt. No significant depreciation effect was found for countries with strong current account positions or low external debt; countries with high international reserves, on the other hand, experienced large depreciations in tandem with Bernanke's QE supporting statements.

Significant exchange rate depreciations were also associated with FOMC QE statements in the full sample, in both fragile and weak groups (Table 5), and in all of the sub-samples (Table 4). Interesting, no asymmetric effects were found between those with weak or strong fundamentals—the coefficients on the exchange rate response to FOMC QE support news were virtually identical (and significant) across subgroups.

Differential effects emerge again in stock market and CDS responses to QE. Bernanke and FOMC QE news were associated with *higher* stock prices of the fragile group, but did not impact the stock prices of the strong group. And, while Bernanke QE had no discernable effect on CDS spreads in any group (Table 4 or Table 5), FOMC QE news only lowered CDS spreads in group of emerging countries with low international reserves (Table 4C), presumably driving the full sample results. By contrast, Governor/President QE news was associated with *lower* stock market indices for both fragile and robust groups (Table 5), and coefficient estimates are similar in magnitudes regardless of international fundamental positions. In terms of CDS spreads, Fed Governor/President QE news had no discernable effect in the full sample but appears to raise spreads for the robust group of countries (Table 5). This result stems from the very strong rise in CDS spreads in countries with high international reserve positions. However, somewhat at odds with the other results, spreads climbed in those countries with relatively high external debt positions. The deferential impacts of the news source reflect the much higher frequency of Governors/Presidents news [26 tapering, 22 QE] in comparison to Bernanke's news [3 tapering, and 7 QE] and FOMC QE news [5]. On balance, the market was focused and reacted more on the scarcer and more coherent news from Bernanke and the FOMC, than the frequent and diffused news from Governors/Presidents. Governors/Presidents news reflected the inner debate among heterogonous and non-coordinated views of FED's senior officials, whereas Bernanke's and FOMC QE news were viewed as much clearer signals regarding the stance of FED's policies. These interpretations are also supported by the results reported for the full sample (Table 3).

3.4 Robust and Fragile Fundamentals and Tapering Dynamics

Emerging market countries with robust (fragile) fundamentals—those with current account surpluses (deficits), high (low) international reserves and low (high) external debt—were most (less) affected by tapering announcements. We argue above that this may be because robust (fragile) economies were more (less) exposed to financial follows in search of higher yields during the earlier QE years, and therefore more (less) likely to be exposed when tapering starts, i.e. markets expect that capital flow reversals occur mainly in countries that experienced the largest inflows initially. This may simply be the impact effect, however, and the fragile economies may experience tapering effects with some delay.

This interpretation is consistent with Figures 1-6. Figures 1, 2 and 3 show the impact of Bernanke tapering announcements on stock prices, exchange rates and CDS spreads, respectively, for the fragile and strong groups. Though we find the *impact* effects of Bernanke tapering news depreciated exchange rates most in the robust group, by the end of 2013 the fragile group had experienced most depreciation (Figure 1). And while Bernanke tapering caused CDS spreads to rise substantially more in the robust group, by the end of the year CDS spreads had climbed more in the fragile group (Figure 3). Stock prices did not show significant differential impact effects across the fragile and robust groups, but over time it appears that the robust group has performed less well.

Figures 4, 5 and 6, reporting the stock market indices, exchange rates, and sovereign spreads of Brazil and Turkey (relatively fragile countries) and Hungary (relatively robust country), during November 27, 2012-October 3, 2013. Again, towards the end of the sample period the fragile countries were not insulated from the tapering news. Indeed, overtime the fragile countries were hit harder than the stronger countries.

The impact of the tapering news focused first on the strong countries, probably in anticipation of large short-run outflows of past hot money inflows. Market attention shifted overtime to the possibility that fragile countries would find it harder to adjust to the higher U.S. interest rates inducing by future tapering, leading to large adjustments in last quarter of 2013. Arguably, the initial large effect of the tapering news, impacting mostly the strong countries may also reflect financial markets' initial inattention to tail risks, overlooking the vulnerability of the weaker emerging markets to the adverse implications of higher future global interest rates. Indeed, in the last quarter of 2013, financial markets re-focused attention on the fragile emerging markets, and hammered the prices of "the Fragile Five," -- Brazil, India, Indonesia, South Africa, Turkey, a sub group of the weaker emerging markets.

4. Concluding Remarks

Chairman Bernanke's tapering news had large effects on emerging markets, resulting in substantial drops in stock market indices and large exchange rate depreciations. This indicates the expectation of reduced capital inflows and carry-trade activity to emerging markets, with less investment in equity markets. By contrast, numerous and frequently quite vigorous statements in support of tapering by Fed Presidents had little discernable effect on emerging market financial prices—equities, exchange rates, CDS spreads—during our sample period. (No tapering news as attributable to Fed Governors during this period, only Federal Reserve Bank Presidents). This may be because one of the Fed Presidents—Fisher of the Federal Reserve Bank of Dallas -- made many public statements advocating tapering (9 of our 26 events) that may have been discounted by financial markets due to their frequency and predictability of the message. Governor/President QE statements were associated significant exchange rate appreciation, however, as were statements by Bernanke and the FOMC in favor of continuing the program. Statements in support for continuing QE was across a broad spectrum of Fed Governors (including Vice Chair Yellen) and Federal Reserve Bank Presidents during our sample period, perhaps accounting for the strong impact on the markets.

Our analysis also identified strong and systematic heterogeneity of adjustment to Fed tapering (and QE) news across emerging markets. The initial impact of Chairman Bernanke's tapering news had the largest effect on financial markets in emerging markets that had robust/strong international positions (i.e. current account surpluses, low foreign debt, high international reserves). Tapering news by Fed Presidents had little or no discernable impact on exchange rates regardless of whether they were classified as robust/weak in fundamentals, had current account surpluses or deficits, had high/low international reserves or had low/high external debt.

In terms of the dynamics of financial markets in robust and fragile economies, it appears that emerging markets with more fragile international positions were also affected, especially the 'fragile five,' over periods extending beyond the initial impact effects of Fed tapering announcements. These results suggest that, in the era of financial globalization, emerging market financial markets are not insulated from expected changes in the Fed's policy stance although it is sensitive to the heterogeneity among countries (Powell, 2013; and Nechio, 2014). Understanding the factors accounting for the timing and the intensity of market reactions deserve further exploration. The greater impact of Fed news on the robust emerging markets may be explained by anticipated balance sheet adjustments, where the size of positions and the liquidity of markets play a role (Eichengreen and Gupta, 2014). Alternatively, market attention may shift over time from the short run adjustment of positions, to the reassessment of the greater adjustment challenges facing the fragile countries to the post tapering world (Sims, 2010; and Mondria et al., 2010). Investigating the possible linkages between faster price adjustment and less volatile future growth patterns is left for future research.

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Table 1: Number and Examples of Taper and QE "News" Events
(November 27, 2012-October 3, 2013

Source of events:	**Chairman Bernanke**		**Governor /President**		**FOMC**		**Aggregate**	
	Tapering	QE	Tapering	QE	Tapering	QE	Tapering	QE
Number of Events:	3	7	26	22	0	5	29	33

Examples of Announcements (Congressional Testimony, Speeches, FOMC statements, etc.)

Ben Tap (Bernanke Tapering): May 22, 2013 Bernanke said the Fed could "take a step down in our pace of purchases" in the "next few meetings" in testimony to the Joint Economic Committee of Congress.

Ben QE (Bernanke Quantitative Easing): January 24, 2013 Testimony to Senate Banking Committee
"We do not see the potential costs of the increased risk- taking in some financial markets as outweighing the benefits of promoting a stronger economic recovery. Inflation is currently subdued, and inflation expectations appear well anchored." Bernanke used his testimony to push back against colleagues on the Federal Open Market Committee who favor curtailing the $85 billion in monthly bond-buying.

Gov/Pres Tap (FR Governor or FRB President Tapering): June 3, 2013
Federal Reserve Bank of San Francisco President John Williams said policy makers may start reducing the pace of bond purchases over the next three months and potentially end quantitative easing by year-end. With continued "good signs" on jobs and confidence in a "substantial improvement" I could see as "early as this summer some adjustment, maybe modest adjustment downward, in our purchase program," he said today in Stockholm.

Gov/Pres QE (FR Governor or FRB President Quantitative Easing): March 27, 2013
Two regional Federal Reserve presidents said they want the Fed to keep buying bonds through the end of 2013, while a third official said the central bank isn't doing enough to spur economic growth. "We should continue our large-scale asset purchases of Treasury and mortgage-backed securities through this year -- although the amount may need to be adjusted up or down, depending on how the economic situation evolves," Boston Fed President Eric Rosengren said today in a speech in Manchester, New Hampshire. "This is a point when we have to be patient and let our policies work," with stimulus "firing on all cylinders," Chicago's Charles Evans said to reporters.

FOMC QE (FOMC Quantitative Easing): May 1, 2013 FOMC Meeting Statement
The Federal Reserve said it will keep buying bonds at a monthly pace of $85 billion while standing ready to raise or lower purchases as economic conditions evolve. The purchases will remain divided between $40 billion a month of mortgage-backed securities and $45 billion a month of Treasury securities.

Table 2: Emerging Market Sample

Country	CAB/GDP (%)	Reserves/GDP (%)	External Debt/GDP (%)
Robust Group			
Peru	-4.89	31.11	25.72
Venezuela	2.82	2.10	20.14
Israel	2.33	28.68	37.00
Korea	4.61	26.86	37.74
Malaysia	3.49	43.11	32.87
Philippines	2.51	27.04	30.34
Thailand	0.11	41.09	37.04
Bulgaria	1.15	32.66	72.56
Russia	2.89	22.44	31.56
China	2.50	39.32	8.99
Hungary	2.22	34.22	136.53
Fragile Group			
Turkey	-7.38	12.85	43.30
South Africa	-6.07	11.82	34.40
Argentina	-0.75	7.13	24.25
Brazil	-3.38	16.75	19.74
Chile	-4.58	14.55	42.61
Colombia	-3.22	10.82	22.18
Mexico	-1.34	12.37	29.90
India	-4.41	15.02	20.85
Indonesia	-3.41	12.55	25.86
Pakistan	-0.97	3.10	24.49
Ukraine	-7.29	12.37	78.49
Czech R.	-1.76	21.75	52.33
Latvia	-1.14	23.82	140.82
Lithuania	-0.26	15.15	79.00
Poland	-3.03	20.03	75.37
Romania	-1.96	22.95	77.38

Notes: Current account balance (in percent of GDP) and international reserves (in percent of GDP) data is taken from IMF World Economic Outlook Data Base, and external debt (in percent of GDP) is from the CIA World Factbook. A country is grouped under "robust" or "fragile" based on whether it has current account surplus, is high reserves and low external debt. Thus, if at least 2 of 3 (or 3 of 3) above criteria holds, then a country is in "robust group", otherwise it is in "fragile group". Low international reserve level is defined as a reserves/GDP ratio below 20%, and low external debt is defined as external debt/GDP ratio less than 34 %. Both cut-off points are the median values of their respective samples.

Table 3: Full Sample -- Asset Market Reaction to Fed Announcements

	Stock Market	**Exchange Rate**	**CDS Spreads**
	(1)	(2)	(3)
Ben Tap	-0.327*	0.212***	-0.144
	(0.164)	(0.062)	(3.927)
Ben QE	0.129	-0.133***	-1.394
	(0.128)	(0.036)	(1.054)
Gov/Pres Tap	0.036	-0.009	0.592
	(0.043)	(0.012)	(0.696)
Gov/Pres QE	-0.172***	-0.095***	-3.241
	(0.055)	(0.018)	(4.423)
FOMC QE	0.166**	-0.245***	-3.866*
	(0.079)	(0.044)	(1.884)
Constant	0.046***	0.031***	0.415
	(0.009)	(0.004)	(0.478)
Observations	5,590	5,590	5,371
R-squared	0.004	0.011	0.001
Number of Countries	26	26	25

Notes: Tables presents panel fixed effect estimation results with robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Independent variables are log first difference of stock market index, foreign exchange rate, and change in CDS spreads in specification (1) through (3), respectively. Stock market and exchange rate estimations, specifications (1) and (2), excludes Venezuela, CDS spread estimation excludes China and Pakistan.

Table 4A: Differential Effects -- Current Account Deficit and Surplus Countries

	Stock Market		Exchange Rate		CDS Spreads	
	CA Deficit	CA Surplus	CA Deficit	CA Surplus	CA Deficit	CA Surplus
	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)
Ben Tap	-0.228	-0.513	0.114*	0.397**	-2.760	4.505**
	(0.198)	(0.295)	(0.056)	(0.128)	(6.037)	(1.516)
Ben QE	0.204**	-0.012	-0.128***	-0.143	-2.263	0.142
	(0.079)	(0.343)	(0.039)	(0.080)	(1.610)	(0.349)
Gov/Pres Tap	-0.000	0.104	-0.016	0.005	1.069	-0.261
	(0.060)	(0.089)	(0.016)	(0.016)	(1.066)	(0.293)
Gov/Pres QE	-0.154*	-0.209**	-0.110***	-0.068**	-6.169	2.008
	(0.075)	(0.074)	(0.025)	(0.021)	(6.816)	(1.120)
FOMC QE	0.224**	0.052	-0.247***	-0.243***	-4.686	-2.357
	(0.101)	(0.122)	(0.064)	(0.045)	(2.816)	(1.420)
Constant	0.047***	0.045***	0.042***	0.011	0.671	-0.047
	(0.012)	(0.012)	(0.005)	(0.007)	(0.735)	(0.113)
Observations	3,679	1,911	3,679	1,911	3,460	1,911
R-squared	0.004	0.006	0.009	0.022	0.002	0.011
# of countries	18	9	18	9	17	9

Notes: Tables presents panel fixed effect estimation results with robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Independent variables are log first difference of stock market index, foreign exchange rate, and change in CDS spreads in specification (1) through (3), respectively. Stock market and exchange rate estimations, specifications (1) and (2), excludes Venezuela, CDS spread estimation excludes China and Pakistan.

Table 4B: Differential Effects -- International Reserves: Low and High Reserve Countries

	Stock Market		Exchange Rate		CDS Spreads	
	Low Reserves	High Reserves	Low Reserves	High Reserves	Low Reserves	High Reserves
	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)
Ben Tap	-0.344	-0.312	0.122	0.290***	-3.726	3.163***
	(0.274)	(0.204)	(0.078)	(0.092)	(8.168)	(1.013)
Ben QE	0.239**	0.035	-0.080*	-0.179***	-2.533	-0.343
	(0.107)	(0.220)	(0.044)	(0.054)	(2.159)	(0.376)
Gov/Pres Tap	-0.016	0.081	-0.029	0.008	1.646	-0.376*
	(0.068)	(0.054)	(0.021)	(0.012)	(1.407)	(0.176)
Gov/Pres QE	-0.214*	-0.136**	-0.113***	-0.081***	-7.565	0.750***
	(0.100)	(0.057)	(0.035)	(0.017)	(9.256)	(0.218)
FOMC QE	0.251*	0.092	-0.229**	-0.259***	-7.233*	-0.758
	(0.134)	(0.091)	(0.090)	(0.033)	(3.719)	(0.535)
Constant	0.062***	0.032***	0.055***	0.011**	0.934	-0.063*
	(0.014)	(0.011)	(0.006)	(0.005)	(1.002)	(0.034)
Observations	2,580	3,010	2,580	3,010	2,576	2,795
R-squared	0.007	0.003	0.008	0.018	0.002	0.011
# of countries	12	14	12	14	12	13

Notes: Tables presents panel fixed effect estimation results with robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Independent variables are log first difference of stock market index, foreign exchange rate, and change in CDS spreads in specification (1) through (3), respectively. Low (high) international reserve level is defined as a reserves/GDP ratio below (above) 20%. Stock market and exchange rate estimations, specifications (1) and (2), excludes Venezuela, CDS spread estimation excludes China and Pakistan.

Table 4C: Differential Effects -- International Debt Levels: High and Low Debt Countries

	Stock Market		Exchange Rate		CDS Spreads	
	High Debt	Low Debt	High Debt	Low Debt	High Debt	Low Debt
	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)
Ben Tap	0.023	-0.677***	0.180**	0.245**	0.773*	-1.137
	(0.224)	(0.203)	(0.082)	(0.095)	(0.403)	(8.356)
Ben QE	-0.079	0.337**	-0.207***	-0.059	0.185	-3.105
	(0.219)	(0.113)	(0.052)	(0.044)	(0.443)	(2.076)
Gov/Pres Tap	0.045	0.027	0.008	-0.026	-0.131	1.380
	(0.068)	(0.056)	(0.011)	(0.021)	(0.249)	(1.424)
Gov/Pres QE	-0.191**	-0.154*	-0.083***	-0.108***	0.644**	-7.450
	(0.080)	(0.078)	(0.018)	(0.033)	(0.229)	(9.265)
FOMC QE	0.007	0.324***	-0.239***	-0.252***	-0.749	-7.243*
	(0.115)	(0.092)	(0.041)	(0.080)	(0.554)	(3.714)
Constant	0.045***	0.047***	0.010*	0.053***	0.101**	0.756
	(0.014)	(0.010)	(0.005)	(0.006)	(0.040)	(1.002)
Observations	2,795	2,795	2,795	2,795	2,795	2,576
R-squared	0.003	0.011	0.015	0.010	0.002	0.002
# of countries	13	13	13	13	13	12

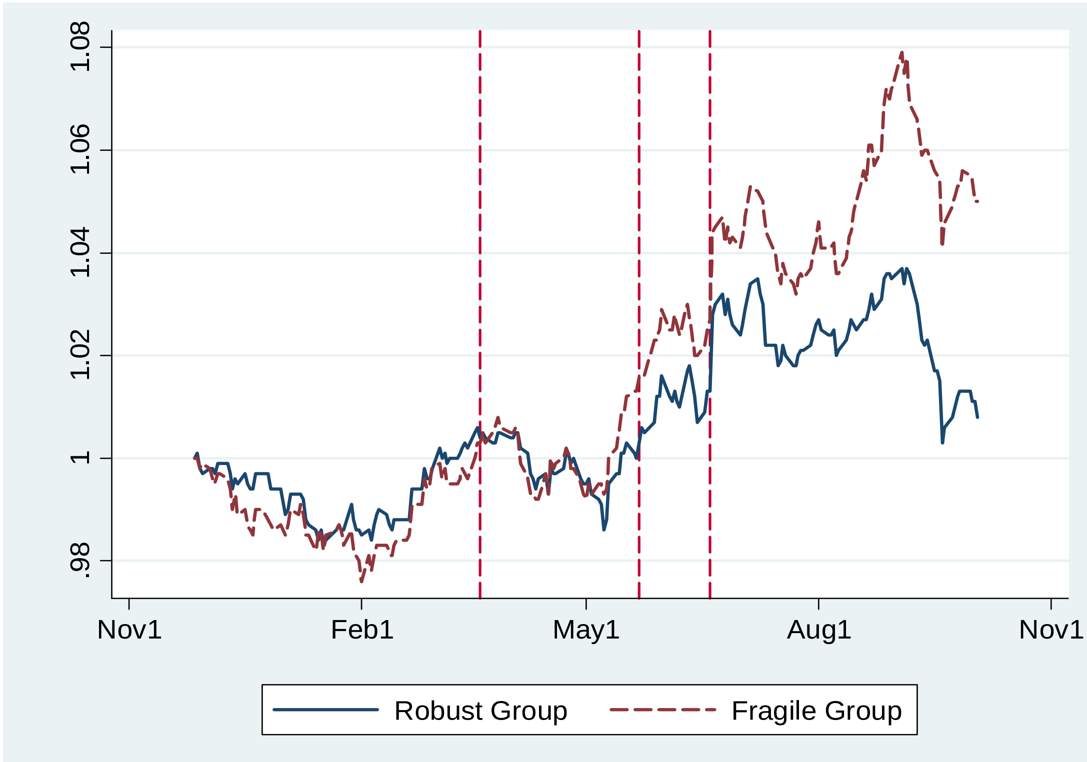
Notes: Tables presents panel fixed effect estimation results with robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Independent variables are log first difference of stock market index, foreign exchange rate, and change in CDS spreads in specification (1) through (3), respectively. Low (high) external debt is defined as external debt/GDP ratio less (more) than 34%. Stock market and exchange rate estimations, specifications (1) and (2), excludes Venezuela, CDS spread estimation excludes China and Pakistan.

Table 5: Differential Effects – Robust and Fragile Countries

	Stock Market		Exchange Rate		CDS Spreads	
	Fragile	Robust	Fragile	Robust	Fragile	Robust
	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)
Ben Tap	-0.234	-0.476	0.112*	0.373**	-3.283	4.563***
	(0.211)	(0.267)	(0.060)	(0.117)	(6.428)	(1.357)
Ben QE	0.206**	0.006	-0.133***	-0.134*	-2.277	-0.078
	(0.084)	(0.307)	(0.041)	(0.072)	(1.721)	(0.382)
Gov/Pres Tap	0.004	0.087	-0.016	0.002	1.182	-0.298
	(0.063)	(0.081)	(0.017)	(0.015)	(1.133)	(0.264)
Gov/Pres QE	-0.165*	-0.185**	-0.113***	-0.068***	-6.637	1.894*
	(0.079)	(0.071)	(0.027)	(0.019)	(7.266)	(1.007)
FOMC QE	0.211*	0.091	-0.250***	-0.238***	-4.871	-2.308
	(0.107)	(0.116)	(0.068)	(0.040)	(3.001)	(1.268)
Constant	0.057***	0.027**	0.042***	0.015**	0.700	-0.019
	(0.013)	(0.011)	(0.005)	(0.006)	(0.784)	(0.103)
Observations	3,464	2,126	3,464	2,126	3,245	2,126
R-squared	0.004	0.005	0.009	0.022	0.002	0.012
# of countries	17	10	17	10	16	10

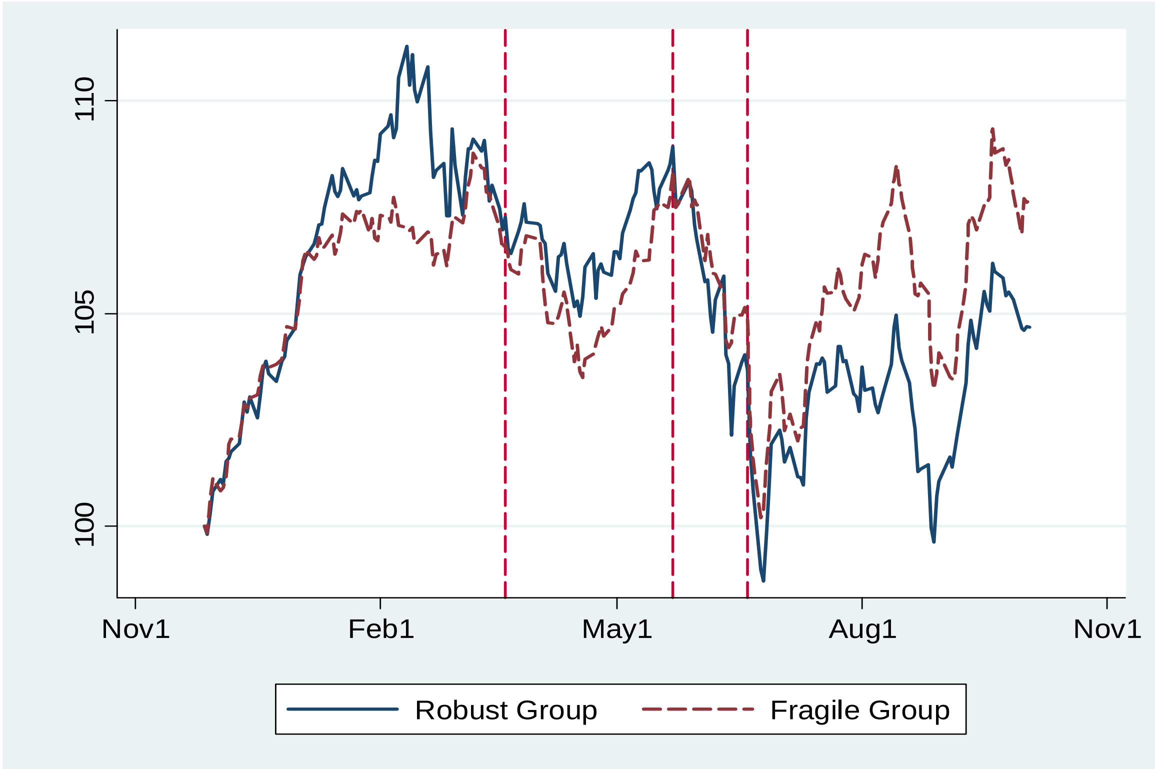
Notes: Tables presents panel fixed effect estimation results with robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Independent variables are log first difference of stock market index, foreign exchange rate, and change in CDS spreads in specification (1) through (3), respectively. A country is grouped under "robust" or "fragile" based on whether it has current account surplus, is high reserves and low external debt. Thus, if at least 2 of 3 (or 3 of 3) above criteria holds, then a country is in "robust group", otherwise it is in "fragile group". Stock market and exchange rate estimations, specifications (1) and (2), excludes Venezuela, CDS spread estimation excludes China and Pakistan.

Figure 1: Foreign Exchange Rate and Tapering "Events"



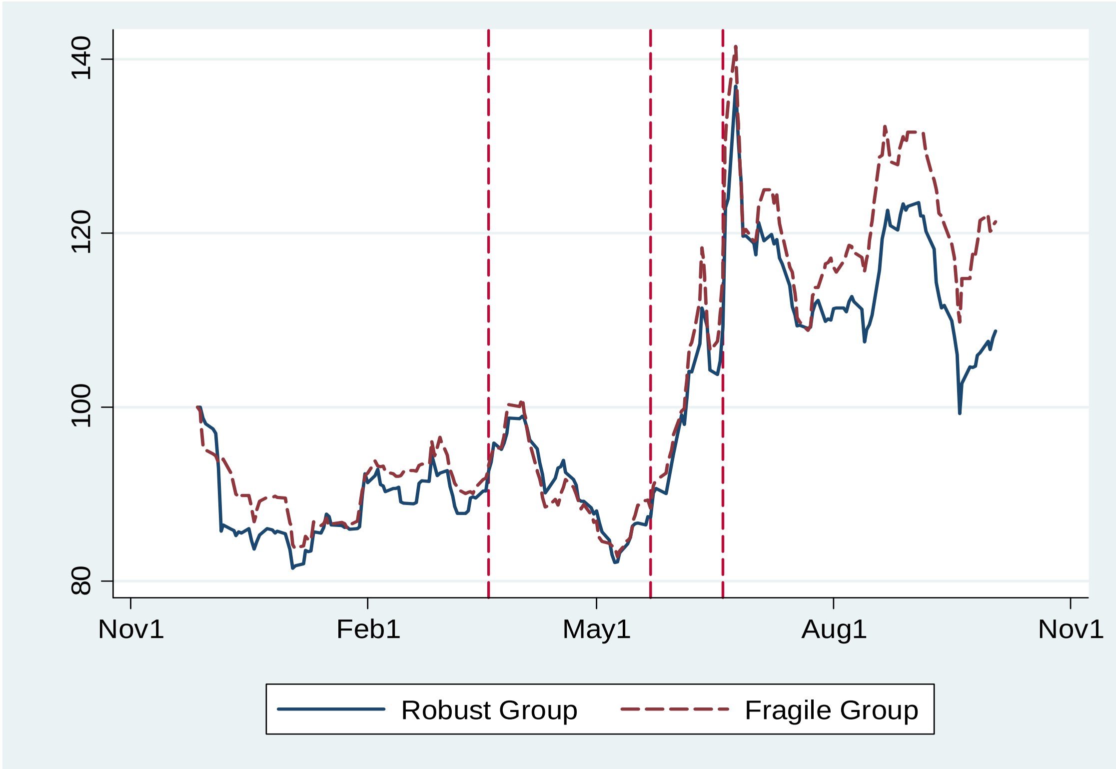
Notes: Vertical dashed lines indicate Bernanke's tapering announcement dates (20 March 2013, 22 May 2013, 19 June 2013) as described in data section. For each country, nominal exchange rate (national currency per US dollar) index is constructed by setting equal "1" at the beginning of our sample, 27 November 2012. The (unweighted) average for "robust group" (Peru, Israel, South Korea, Malaysia, Philippines, Thailand, Bulgaria, Russia, Hungary) and "fragile group" (Turkey, South Africa, Argentina, Brazil, Chile, Columbia, Mexico, India, Indonesia, Pakistan, Ukraine, Czech Republic, Latvia, Lithuania, Poland, Romania) is taken on each day over the sample.

Figure 2: Stock Market Index and Tapering "Events"



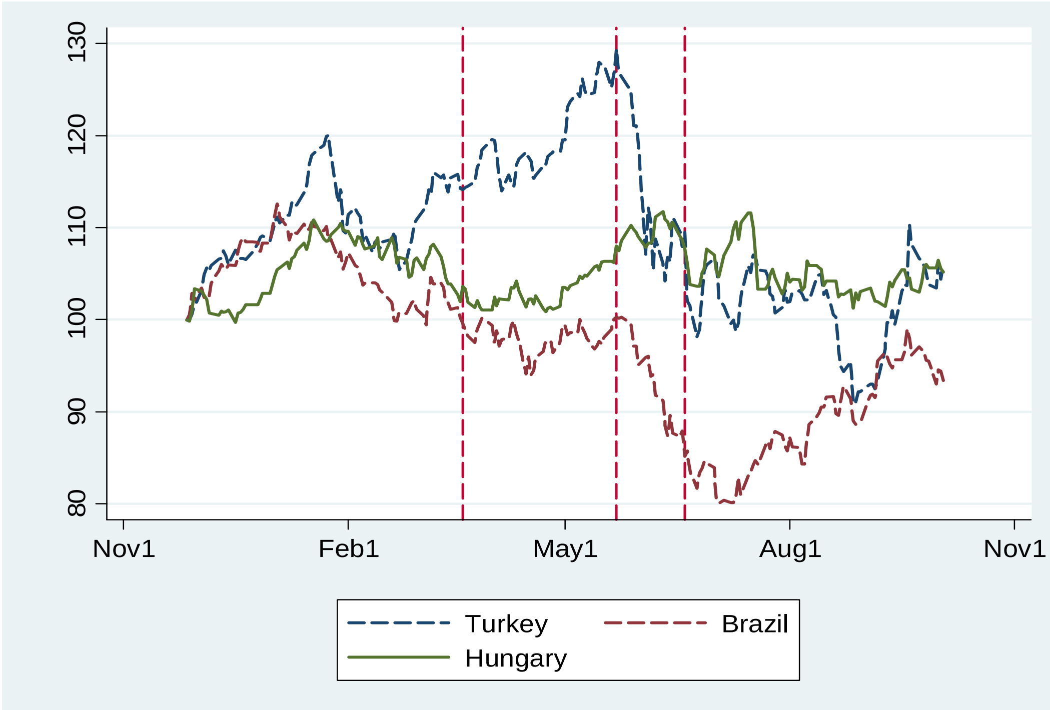
Notes: Vertical dashed lines indicate Bernanke's tapering announcement dates (20 March 2013, 22 May 2013, 19 June 2013) as described in data section. For each country, stock market index is constructed by setting equal "100" at the beginning of our sample, 27 November 2012. The (unweighted) average for "robust group" (Peru, Israel, South Korea, Malaysia, Philippines, Thailand, Bulgaria, Russia, Hungary) and "fragile group" (Turkey, South Africa, Argentina, Brazil, Chile, Columbia, Mexico, India, Indonesia, Pakistan, Ukraine, Czech Republic, Latvia, Lithuania, Poland, Romania) is taken on each day over the sample.

Figure 3: CDS Spreads and Tapering "Events"



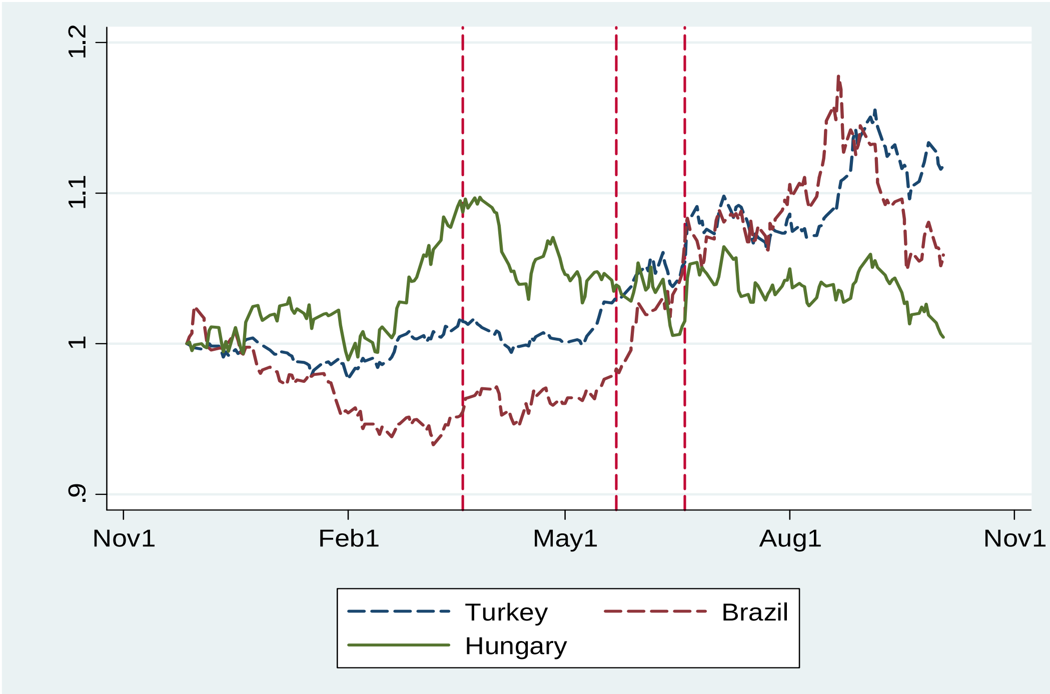
Notes: Vertical dashed lines indicate Bernanke's tapering announcement dates (20 March 2013, 22 May 2013, 19 June 2013) as described in data section. For each country, CDS spread index is constructed by setting equal "100" at the beginning of our sample, 27 November 2012. The (unweighted) average for "robust group" (Peru, Israel, South Korea, Malaysia, Philippines, Thailand, Bulgaria, Russia, Hungary) and "fragile group" (Turkey, South Africa, Argentina, Brazil, Chile, Columbia, Mexico, India, Indonesia, Pakistan, Ukraine, Czech Republic, Latvia, Lithuania, Poland, Romania) is taken on each day over the sample.

Figure 4: Selected Countries: Stock Market and Tapering "Events



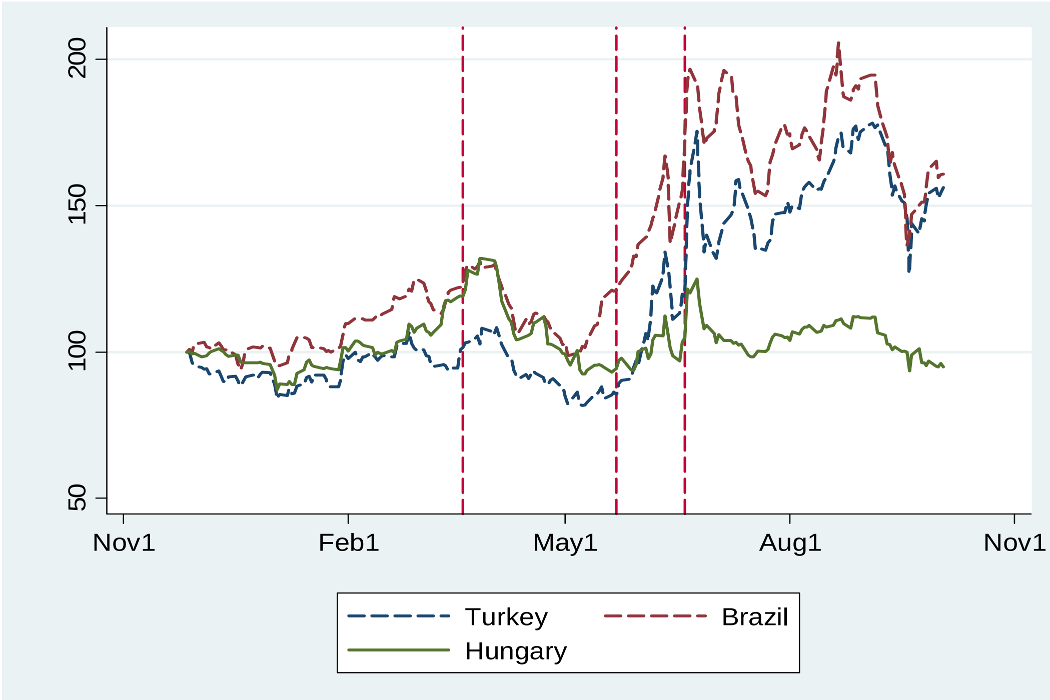
Notes: Vertical dashed lines indicate Bernanke's tapering announcement dates (20 March 2013, 22 May 2013, 19 June 2013) as described in data section. For each country, stock market index is constructed by setting equal "100" at the beginning of our sample, 27 November 2012.

Figure 5: Selected Countries: Foreign Exchange Rate and Tapering “Events



Notes: Vertical dashed lines indicate Bernanke’s tapering announcement dates (20 March 2013, 22 May 2013, 19 June 2013) as described in data section. For each country, nominal exchange rate (national currency per US dollar) index is constructed by setting equal “1” at the beginning of our sample, 27 November 2012.

Figure 6: Selected Countries: CDS Spreads and Tapering "Events



Notes: Vertical dashed lines indicate Bernanke's tapering announcement dates (20 March 2013, 22 May 2013, 19 June 2013) as described in data section. For each country, CDS spread index is constructed by setting equal "100" at the beginning of our sample, 27 November 2012.