Issues in Political Economy, Vol 31(2), 2022, 5-27

The Spillover Effects of Quantitative Easing on Capital Flows to Emerging Market Economies

Taylor Zixuan Zhang, Smith College

I. INTRODUCTION

The 2008–2009 global financial crisis (GFC) was accompanied by huge negative shocks to global monetary, financial, and economic conditions. Since the policy rates were close to zero, the Federal Reserve could no longer effectively stimulate economic activity which limited the efficacy of traditional use of conventional monetary policy at the time of crisis[1]. Instead, to mitigate the repercussions of the 2008 credit market turmoil, the Federal Reserve launched an unprecedented initiative to purchase considerable amounts of long-term securities in order to restore credit market conditions, notably in the housing market. Given the constraints of the zero lower bound on short-term interest rates, this policy—which has come to be known as "Quantitative Easing" (QE)—was designed with the explicit goal of boosting weak asset markets as well as promoting real activity (Lim et al., 2014). The Federal Reserve stated on November 25, 2008, that it would buy up to $100 million in government-sponsored enterprise (GSE) debt and up to $500 million in mortgage-backed securities to decrease risk spreads on GSE debt and calm the housing credit market (Neely, 2010). Since this unconventional monetary policy, or QE[2], is essentially the purchase of long-term assets, this impacts the financial markets and eventually boosts the real economy by creating a large amount of liquidity in the market.

Meanwhile, faced with near-zero returns in the U.S. and other high-income countries, financial capital began to seek alternative sources of yield. Emerging economies, which had enjoyed robust growth rates and stable political-economic environments over the past decade, appeared to be an ideal investment alternative (Lim et al., 2014). Large foreign portfolio flows from developed economies to developing and emerging economies were spurred by quantitative easing in developed nations, which had both good and negative consequences (Kalu et al., 2020). Extensive research has investigated the impact of the U.S. QE, both on the domestic and international market (Neely 2010; Joyce et al., 2012; Lim et al., 2014; Mukherjee and Bhaduri, 2015). According to Gagnon et al. (2011), the Fed's purchases between December 2008 and March 2010 (LSAP1) had economically substantial and long-term implications on longer-term interest rates on Treasuries, agency mortgage-backed securities, and corporate bonds. They calculated that the LSAPs lowered the 10-year term premium by between 30 and 100 basis points overall, based on both event studies around significant LSAP announcements and time series regressions. Neely (2010) finds that the LSAP announcements lowered international long-term bond rates and the spot value of the dollar. Besides, Lim et al. (2014) demonstrate that of the 62 percent increase in capital inflows to developing economies during 2009-2013 related to changing global monetary conditions, at least 13 percent was attributable to QE.

[1] During severe economic downturns, the central bank will implement expansionary monetary policy by lowering policy rates (i.e., interest rates) to stimulate the economy. However, traditional monetary policy tools may no longer be effective in achieving their goals when the policy rates are very close to zero, a macroeconomic phenomenon known as the zero lower bound.

[2] QE and LSAP (large-scale asset purchases) are interchangeable in this paper since both are synonyms for the other.

I am investigating the spillover effects of the U.S. unconventional monetary policy on capital flows into ten big emerging market economies (EMEs[3]): Argentina, Brazil, China, India, Indonesia, South Africa, Korea, Poland, Mexico, and Turkey. In particular, how and to what extent did the QE episodes impact the magnitude of capital inflows to ten EMEs. To investigate the spillover effects, I begin by accounting for potential QE impacts via three transmission channels–liquidity, portfolio balance, and confidence–and then examine whether QE episodes experienced any other effects not captured by the transmission channels. My analysis indicates that there is a positive relationship between QE episodes and net capital inflows, and financial inflows to EMEs operate along all three potential channels of transmission. More importantly, I discover evidence that QE1 had the greatest impact on capital flows into EMEs, increasing capital flows by 5.2%.

Several research studies have looked at the effect of QE on capital inflows to particular economies like Asia and Africa, but few have looked into emerging economies. In addition, the inclusion of capital restrictions is suggested by researchers as an important measure to mitigate the spillover effects of QE (Fofack et al., 2020), supporting it to be added as one control variable. Thus, I include capital restrictions as one control variable to capture the nation's protective policies on capital account and further analyze to what extent capital restrictions affected the financial account during the GFC. This research paper contributes to the literature by providing evidence of a relationship between QE and net capital inflows in ten big EMEs. The fact that there is a significant positive relationship between QE1 and capital inflows indicates the increased frequency and interwoven nature of financial dependence, the interaction between each country, and the importance of the implementation of particular policies in stabilizing the domestic economy when huge amounts of capital flow into the nation.

The rest of the paper is laid out as follows. Section II gives some background and existing literature related to the impact of QE. Section III describes the data sources and summary statistics. Section IV explains the methodologies used in the literature and this analysis. Section V discusses the results of the empirical analysis, with a special focus on capital controls. Section VI discusses the implication of the results and the limitation of the analysis. Section VII concludes.

II. LITERATURE REVIEW

A. Quantitative Easing

Ever since Japan's recession and deflation, the sub-prime crisis, the global financial crisis (GFC), and Europe's debt crisis struck worldwide, resorting to an unconventional monetary policy has been a viable approach for central banks when they confront crucial economic or financial crises (Lee et al., 2020). The U.S. Federal Reserve, together with the Bank of England, the European Central Bank, and the Bank of Japan were among central banks around the world that cut policy interest rates during the GFC to bolster demand during a recession. However, given the severity of the crisis, the U.S. Federal Reserve and other central banks were prompted to pursue unconventional policies, in the form of quantitative easing, as a result of constraints imposed by

[3] The choice of EMEs is derived from the concept of "The Big Ten", or big emerging markets (BEMs), introduced by Gebhart, J. (1997). Korea is no longer considered an emerging market by the IMF, but the analysis of BEMs, which are referred to as EMEs in this paper, still has insightful meaning as they are the leading economies impacting the world economy.

the zero lower bound on nominal interest rates as well as the disruption of the financial system (Joyce et al., 2012). The zero lower bound describes a macroeconomic phenomenon where the interest rate is at, or very close to, zero, which restricts the impact of lowering it further to boost the economy. The most prevailing form of unconventional monetary policy has been Quantitative Easing (QE), and the phrase was first applied to Japan as it encountered bubble-induced deflationary pressures in the 1990s. In particular, since the interest rate was at the zero lower bound, which caused a liquidity trap and limited the central bank's capacity to stimulate economic growth, the Bank of Japan decided to purchase government securities from banks to increase the number of cash reserves kept in the system (Joyce et al., 2012). Thus, during the GFC where interest rates were at an all-time low, the central banks of the U.S., the Euro area, and the UK have all followed Japan in adopting QE, which led to substantial increases in their balance sheets. In particular, the Fed has bought U.S. Treasuries and large amounts of agency debt and mortgage-backed securities.

Lim et al. (2014) explain that QE was initially undertaken to repair financial market functioning and intermediation during the GFC, but subsequently evolved to support the post-crisis recovery in growth and employment. Joyce et al. (2012) propose that heterogeneity across agents, limited participation, and imperfections are essential underlying mechanisms to ensure the effectiveness of QE, where the central bank could influence the pattern of yield on different assets due to imperfect assets substitutability. In other words, investors prefer a particular segment of the yield curve to invest.

To empirically examine the impact of QE, lots of scholars start by investigating the effect of QE on the U.S. market, especially in areas like the financial markets, exchange rate, and macroeconomy (Neely, 2010; Joyce et al., 2012). Studying the effect of the Federal Reserve's large-scale asset purchases (LSAP) on foreign long bond yields and exchange rates, Neely (2010) finds that the LSAP announcements lowered international long-term bond rates and the dollar's spot value significantly, suggesting that central banks are not toothless when rates hit the zero bound. These modifications occurred in close proximity to the announcement timings and were highly unlikely to have happened by chance. Meanwhile, Joyce et al. (2012) conclude that asset market purchases do lower yields and longer-term interest rates in the U.S., but their effects have not been enough to offset the negative forces of a banking crisis and a deleveraging-led downturn.

B. Spillovers of Quantitative Easing

In the early phase of QE, U.S. policymakers advocated that QE would have a positive trickle-down effect on the emerging markets, because with high liquidity and low-interest rate, U.S. investors can channel their excess funds to EMEs (Mukherjee and Bhaduri, 2015). However, the extended period of unconventional monetary policies in high-income countries has been a source of significant concern among many developing countries, who fear potential appreciation pressures, a build-up of financial imbalances, asset price bubbles, and an overheating of the domestic economies (Fratzscher et al., 2018). EMEs have voiced their concern over unmitigated financial flows due to QE, even at the beginning of its implementation (Lim et al., 2014). In fact, President Rousseff of Brazil has been criticizing the Fed's policies, arguing that QE policies have triggered a "monetary tsunami," created excessive global liquidity, and caused massive capital inflows to

EMEs, which has led to a "currency war."[4] Thus, analyzing the spillovers of return and volatility is important as it relates to portfolio management, financial risk management, and asset allocation (Lee et al., 2020). Figure 1 (in the Appendix) presents capital flows into EMEs in three categories– direct, portfolio, and other investment–from 2000Q1 to 2013Q2. The figure shows a big surge of capital flows during the QE periods after they collapsed during the GFC, and that total capital flows into EMEs during QEs are comparable to those before the GFC.

Scholars interested in QE have investigated its spillover effects on specific countries. Kalu et al. (2020) examine the effects of U.S. monetary policy normalization on the African stock market using panel data from six African countries, and find that stock prices in Africa are negatively affected by U.S. 10-year bond yield and Treasury bill rate shocks. Meanwhile, the fact that the U.S. Treasury bill rate is a key depressive of African stock values demonstrates the short-termism of foreign investment inflows. Cho and Rhee (2013) find that monetary easing in the U.S. affects Asian countries through either appreciation of currency values or increases in prices of housing. Using event study methodology, Lubys and Panda (2021) find that, during the policy announcements from Europe and the United States, stock market sector indexes in the BRICS[5] tend to deviate significantly from their usual behavior. Besides, Msoni (2018) shows that private capital inflows to the BRICS rose over the QE intervention period, with the first phase of QE showing a greater rise than subsequent QE periods.

The influence of private capital flows into EMEs is a point of contention among academics and policymakers. Capital flows into developing economies might promote investment, reserve accumulation, and economic development. Duca, Nicoletti, and Martinez (2016) employ a counterfactual analysis to show that bond issuance by domestic issuers in EMEs since 2009 would have been halved without U.S. unconventional monetary policies. On the other hand, the concern about capital flows into EMEs is compounded by the possibility of asset bubbles and disorderly capital flow reversals. Tillmann (2016) concludes that QE has significant effects on EME's financial conditions and plays a considerable role in explaining capital inflows, equity process, and exchange rates. Fratzscher et al., (2018) find a heterogeneous response of capital flows in different QE episodes, with QE1 prompting portfolio rebalancing towards the U.S., while QE2 and QE3 triggered a rebalancing outside the U.S., which supports concerns expressed by policymakers in EMEs.

C. Channels of Transmission for Unconventional Monetary Policy

The premise of unconventional monetary policy is that the traditional channels of interest rates, exchange rates, and equity prices are either ineffective, unavailable, or weak, which justifies large-scale asset market intervention by the central bank (Lim et al., 2014). A central transmission channel by which QE affects cross-border capital inflows is via the *portfolio balance* channel, and its mechanisms are consistent with the preferred-habitat theories, where investors prefer a particular segment of the yield curve (Joyce et al., 2012). The central bank's asset purchases of long-duration assets reduce the available stock of privately held risky assets. To meet investors'

[4] https://www.bloomberg.com/news/articles/2012-03-05/rousseff-in-germany-eyes-measures-to-shield-brazil-from-monetary-tsunami- (Accessed Dec 12, 2021)
[5] BRICS refers to Brazil, Russia, India, China, and South Africa.

demand for other risky investments, investors favor long-duration assets in the EMEs and rebalancing their portfolios.

The second channel is the *liquidity* channel. Lim et al. (2014) show that QE operations have increased reserves on the balance sheets of private banks, resulting in more liquidity in the secondary markets, a decline in borrowing costs, and an increase in overall bank lending, including lending to EMEs. The last channel is the *confidence* channel, which is buttressed by the idea that central bank asset interventions can reduce volatility and eventually economic uncertainty. Thus, to account for any observable impacts of QE, I add these three channels into my regression, and any additional effects due to unobservable factors are captured by QE dummies. I will discuss this in detail in Section IV.

D. Event Studies and Vector Autoregressive Models

Msoni (2018) offers a comprehensive summary of all the key methodologies employed by scholars investigating the impact of QE. In the empirical literature, event studies and vector autoregressive models (VARs) have been frequently employed to explore the spillover effects of quantitative easing. While event studies have been widely utilized to research the behavior of yields in the aftermath of the Fed's announcements of quantitative easing, VARs have been used to investigate the impact of monetary policy normalization, or "QE tapering." Both techniques have their own set of advantages and disadvantages.

An event study is a method for analyzing the impact of a single event or a series of events on the value of a variable of interest (Msoni 2018). As a result, an event research technique is acceptable if the goal is to analyze the impact of the QE announcements on asset returns. The simplicity of event studies, as well as their capacity to provide clarity on the influence of occurrences, is used by proponents to support their views. While event studies are useful for analyzing the impact of quantitative easing announcements, they are ineffective for capturing the short-term consequences of real quantitative easing activities due to the use of the QE announcements rather than the actual implementation of QE. VARs are more suited to this task. VARs are models in which all variables' lagged values, as well as the present and lagged values of all other variables in the model, are partially explained. Given the constraints of this paper, I decide the best approach was to use the first-differenced instrumental variable method to build a dynamic panel model.

III. DATA

According to the IMF's IFS database, variables related to capital inflows are categorized into three types of investment: direct investment, portfolio investment, and other investment. Other categories such as reserve assets and financial derivatives are also reported, but they are not relevant to the purpose of my study and thus are not included in this paper. I combine all three types of investments to come up with net capital inflows for each emerging market[6]. Net capital inflows are defined as the difference in capital inflows and capital outflows. In particular, capital inflows are net purchases of domestic financial instruments by foreign residents whereas capital outflows are net purchases of foreign assets by domestic residents (Wei, 2008). Given the nature

[6] Net capital inflows essentially refer to inflow minus outflow and thus can be negative.

of real-world data, this dataset contains some but not substantial missing values owing to the unavailability of the data for some countries in certain quarters.

The QE dummies capture the time that each of the three rollouts of QE happened. My QE dates follow those of Lim et al. (2014), who define QE1 as 2009Q1–2010Q3, QE2 as 2010Q4–2011Q2, and QE3 as 2012Q4–2013Q2. I also define allQE as a dummy that equals one when variables fall in any of the three QE episodes. Similarly, the crisis dummy equals one if the data is between 2006Q1 and 2008Q2, as used in several studies (Lim et al., 2014; Park et al., 2014).

Variables capturing three channels of capital inflows (i.e., direct investment, portfolio investment, and other investment) are directly obtained from Federal Reserve Economic Data (FRED), except for VIX, which is collected from the Chicago Board of Options Exchange. Meanwhile, control variables, such as all GDP-related variables, are collected from the World Bank's World Development Indicators. Lastly, the country rating is a score derived from the International Country Risk Guide (ICRG) produced by the PRS Group, capturing country risks based on 12 criteria, including government stability, investment profile, internal conflict, etc. I take the average of all 12 scores as each aspect of the country would influence the mechanisms of capital flows. The frequency of all variables is quarterly, ranging from 2000Q1–2013Q2. A detailed summary statistics of all the key variables is also provided (Appendix, Table 3)

Based on the summary statistics table, the mean of capital inflows is 12692.49 with a standard deviation of 22116.73 million USD. Because capital inflows and quarterly GDP have large standard deviations, I convert both variables to logarithmic form. Since net capital inflows contain negative values, in order to perform a logarithmic transformation, I take the log of the absolute value and then put a negative sign in front of the log value if the original capital inflows are negative[7]. The main finding of my paper relies on capital inflows in logarithmic form, but estimates based on unconverted capital inflows are also reported (Appendix, Table 4). I have four QE dummies: allQE, QE1, QE2, and QE3. Based on the mean value, it's obvious that QE1 was the longest QE episode. The sample ends up having 540 observations, with some missing values of capital inflows.

IV. METHODS

This section discusses key methodologies used in this paper: the fixed effects (FE) model with a lagged dependent variable and the first-differenced instrumental variable (FDIV) method. In order to take advantage of the time series nature of the panel, I employ the FE model with a lag dependent variable to incorporate the dynamic of capital inflow and control any country-specific and time-invariant effects. Since the introduction of the lagged dependent variable would bias the estimates given its correlation with the idiosyncratic errors, I also resort to the FDIV method to mitigate such an endogeneity. In summary, this paper relies on two methodologies: FE and FDIV, each discussed extensively in this section.

[7] The STATA command is -1*log (abs (capital inflows)) for negative capital inflows. However, performing log transformation for negative values has received lots of constructive criticism in academia, as it may essentially bias the distribution of the variable by creating two patterns of normality below and above zero. In this paper, I also employ another popular method to log-transform capital control. This will be discussed in detail in Section VI.

A. Dynamic Panel Models

Many macroeconomists have been interested in estimating dynamic panel models because of the availability of large macroeconomic datasets and the revitalization of interest in long-run growth (Judson and Owen, 1999). This is especially evident given that many economic relationships are dynamic in nature, and dynamic models account for the importance of time in the behavior of variables, allowing researchers to better understand the dynamics of adjustments (Baltagi, 2005).

Dynamic panel models are characterized by the introduction of a lagged dependent variable, but it complicates the estimation. The complexity emerges from the correlation between the individual effects and the lagged variable in either the fixed effects (FE) or random-effect settings (RE), a phenomenon known as endogeneity (Flannery & Hankins, 2013). In most panel data applications, the residuals contain two components: one that is supposed to reflect unobserved heterogeneity and is stable across time, and another that is random, with zero mean and constant variance (Baltagi, 2005). To address such biases, econometric tools have emerged. The bias-corrected LSDV (least square dummy variable) estimator, for example, performs better for longer panels, but its application to unbalanced panels is restricted, necessitating the use of alternatives. When the bias-corrected LSDV isn't an option, the Anderson and Hsiao (1981) IV estimator or the Arellano and Bond (1991) GMM estimator are viable options, each having strengths and shortcomings, and the best approach for estimating the parameters, to some extent, is largely determined by the characteristics and quality of the data provided (Judson and Owen, 1999).

Dynamic fixed effects models are a popular tool for studying the behavior of EMEs' capital flows and they've been used in several research papers (Lim et al., 2014; Park et al., 2014; Fofack et al., 2020; Kalu et al., 2020). The use of country FE to capture the influence of unobserved variations among nations is undoubtedly essential for the investigation of QE's spillover effects on EME capital inflows. For instance, fixed effects in a model assessing the causes of capital flows would reflect growth differentials between emerging and developed countries stemming from disparities in their long-term development potential. Meanwhile, the use of lagged capital flows captures the dynamic nature of capital flows where the value in the previous period sheds light onto the current behavior. By utilizing the lagged capital inflows, I can analyze the dynamics of the relationship between QE and capital flows, accounting for the importance of time in the behavior of capital flows.

According to Baltagi (2018), dynamic relationships can be characterized by the presence of a lagged dependent variable among the regressors, i.e.,

$$y_{it} = \delta y_{i,t-1} + \beta X_{it} + u_{it} \qquad i = 1, \dots, N;\ t = 1, \dots, T \tag{4.1}$$

where y_{it} is the dependent variable, X_{it} is the set of independent variables, δ and $\beta$are parameters to be estimated. The disturbance term, u_{it}, denotes the two-way error components, where $u_{it} = \mu_i + \lambda_t + \varepsilon_{it}$. μ_i represents unobserved individual effects and λ_t represents unobserved time effects. ε_{it} is assumed to be IID[$\varepsilon_{it} \sim IID(0, \sigma_\varepsilon{}^2)$], with no correlation among the residuals.

Equation 4.1 can be constructed as either the FE or RE model. No matter which dynamic panel model to use, Equation 4.1 suggests that any influence that the independent variable has on the outcome variable is now conditioned on the history of the dependent variable $y_{i,t-1}$, considering the dynamic nature of the economic phenomenon. In other words, the autocorrelation is due to the presence of a lagged dependent variable among the regressors and individual effects characterizing heterogeneity among the individuals.

However, since y_{it} is a function of u_{it}, then essentially $y_{i,t-1}$ is also a function of u_{it}. Such a correlation renders the OLS estimator biased and inconsistent as the presence of both $y_{i,t-1}$ and u_{it} violates the assumption of strict exogeneity of the independent variables. One alternative transformation that wipes out the individual effects is the first difference (FD) transformation, which is the methodology employed in my paper.

B. First-differenced Instrumental Variables (FDIV)

Given the issue of endogeneity introduced by $y_{i,t-1}$ which renders standard panel data estimates biased, Anderson and Hsiao (1981) suggested first differencing the model and using $\Delta y_{i,t-2} = (y_{i,t-2} - y_{i,t-3})$ or simply $y_{i,t-2}$ as an instrument for $\Delta y_{i,t-1} = (y_{i,t-1} - y_{i,t-2})$. These instruments will not be correlated with the error terms in the last time period. The AH approach is conducted by differentiating Equation 4.1 to eliminate μ_{it}, which is achieved by subtracting the previous value of each term (as shown in the two equations below).

$$y_{it} - y_{i,t-1} = \delta(y_{i,t-1} - y_{i,t-2}) + \beta(x'_{it} - x'_{i,t-1}) + u_{it}\varepsilon_{it} - \varepsilon_{i,t-1} \quad (4.2)$$

$$\Delta y_{it} = \delta \Delta y_{i,t-1} + \beta \Delta x'_{it} + \Delta u_{it} \qquad t = 2, \ldots, T \quad (4.3)$$

Anderson and Hsiao (1981) propose a two-stage least squares (TSLS) approach to estimate the independent variables and covariates. In the first stage, all variables are regressed on the set of instruments using OLS, and in stage two, values from the first stage are fitted into the original model to drive the instrumental variable estimated for δ and β. Moreover, Arellano (1989) finds that for simply dynamic error components models, the estimate that uses differences $\Delta y_{i,t-2}$ rather than levels $y_{i,t-2}$ for instruments has a singularity point and very large variances over a significant range of parameter values. In contrast, the estimator that uses instruments in levels, $y_{i,t-2}$, has a much smaller variance and is therefore recommended. Thus, in my paper, I use $y_{i,t-2}$ as an instrument for $\Delta y_{i,t-1} = (y_{i,t-1} - y_{i,t-2})$.

The baseline regression equation in my paper is a dynamic panel regression as follows, which heavily follows the design from Park et al. (2014):

$$FI_{it} = \delta FI_{i,t-1} + \lambda L_{it} + \pi PB_{it} + \gamma C_{it} + \theta QE_t + \beta' X_{it} + \rho CRISIS_i + \alpha_i + \tau_t + \varepsilon_{it} \quad (4.4)$$

where FI_{it} is capital flows into country *i* at *t*. Capital inflows are transmitted via three channels: liquidity (L_{it}), portfolio balance (PB_{it}), and confidence (C_{it}). In particular, the liquidity channel L_{it} is measured by the U.S. 3-month Treasury bill rate. The portfolio balance channel PB_{it} is captured by the U.S. yield spread, the difference between yields on 10-year U.S. bonds and 3-month bills[8]. The confidence channel is measured by the Volatility Index (VIX).

[8] Park et al., (2014) also include real interest rates. However, due to substantial missing values in the real interest rates I collected, I rely on the U.S. yield spread to represent the portfolio balance channel. Interestingly, while the interest

The impact of QE is derived from four dummy variables: *allQE*, which takes the value of one during the three QE periods and zero otherwise, and individual QE dummies—*QE1, QE2,* and *QE3*. The explanatory variables also include some additional time-varying country-specific controls X_{it} such as GDP, country rating, and crisis dummy ($CRISIS_i$) that take the value of one between 2008Q3 and 2009Q3 and zero otherwise. Meanwhile, I also include *CAPITAL CONTROL* as one special control variable to capture the nation's protective policies by accounting for the openness of each country's capital market. A detailed investigation into *CAPITAL CONTROL* is conducted in the next section. Finally, the country fixed effect and time fixed effect are also included, which are captured by α_i and τ_t respectively.

As discussed previously, the introduction of the lagged dependent variable biases the estimates. Thus, in addition to the FE model with lagged dependent variable, I employ the first-differenced instrumental variable (FDIV) method to avoid bias in dynamic panel regression. Equation 4.4 can be transformed into the FDIV regression (the AH approach) by first differencing the model and using $FI_{i,t-2}$ as an instrument for $\Delta FI_{i,t-1} = (FI_{i,t-1} - FI_{i,t-2})$. In the next section, I will present results derived from both the standard FE model with lagged inflows and the FDIV model.

V. RESULTS

As alluded to in the previous section, Table 1 demonstrates the empirical results that are derived from the baseline regression equation 4.4. Columns [1] and [2] report estimates relying on the FE models with lagged capital inflows. Whereas columns [3] and [4] employ FDIV to account for the endogeneity of the lagged dependent variable. Each regression model includes three channels and basic controls to account for the transmission of QE and country-specific time-invariant effects, respectively.

rate differential between the developing country vis-à-vis the U.S. (calculated from real interest rates) is included in Park et al. (2014), its estimate is not statistically significant.

Table 1: Net Financial Inflows (*log transformed*), 2000Q1-2013Q2

	(1) FE	(2) FE	(3) FDIV	(4) FDIV
Lagged inflows	0.170***	0.178***	0.0112	0.0135
	(0.0467)	(0.0467)	(0.0936)	(0.0954)
All QE episodes	1.520**		2.106	
	(0.669)		(1.471)	
QE1		2.965***		5.203***
		(0.552)		(1.274)
QE2		1.410*		0.750
		(0.758)		(1.146)
QE3		-1.838		0.855
		(1.594)		(2.879)
Three Channels				
3M T-bill rate	-0.436	-0.957**	-2.224**	-1.721*
	(0.415)	(0.319)	(0.905)	(0.927)
Yield curve	-0.226	-0.998*	-3.611***	-2.974***
	(0.572)	(0.444)	(0.774)	(0.845)
VIX	-0.175***	-0.207***	-0.385***	-0.370***
	(0.0331)	(0.0381)	(0.0437)	(0.0451)
Basic Controls				
GDP	0.814	0.00547	10.49	17.93**
	(2.742)	(2.701)	(9.252)	(8.656)
Emerging GDP growth	0.240**	0.213**	0.271*	0.241
	(0.0741)	(0.0812)	(0.159)	(0.158)
High-income GDP growth	-0.288	-0.245	-0.654**	-0.551**
	(0.165)	(0.167)	(0.278)	(0.262)
Crisis period	1.220*	1.095	-0.347	-0.405
	(0.596)	(0.607)	(1.376)	(1.368)
Country rating	1.508	1.003	-1.928	-1.834
	(1.439)	(1.475)	(2.455)	(2.465)
Observations	510	510	490	490

All level variables are in logarithmic form, but rates, indices and indicators are untransformed
* p<0.10, ** p<0.05, *** p<0.01

In particular, the coefficient on lag inflows is positive across all regression models and specifications, indicating some degree of persistence in the dependent variable. The coefficient of lagged net capital inflows ranges between 0.011 and 0.178, which is less pronounced than what has been reported in other comparable studies (Lim et al., 2014; Park et al., 2014), but is expected as I only select ten EMEs to include in my analysis. Granted that the lagged inflows are significant for estimates utilizing FE models but not for estimates using FDIV, the positive relationship supports the dynamic of capital inflows.

Meanwhile, there is a positive relationship between QE episodes and capital inflows as the estimates of the coefficients are all positive. *QE1*, *QE2*, and *QE3* are included separately in columns [2] and [4], with the coefficient of *QE1* being the greatest, which implies the largest impact *QE1* has in increasing the capital flows into EMEs. The coefficient of *QE1* increases even more after accounting for the endogeneity of lagged inflows. The magnitude of the coefficient decreases for *QE2* and *QE3*, suggesting that LSAPs were more efficacious in the earliest QE episode than in the later ones, which is consistent with what previous literatures have found (Lim et al., 2014; Park et al., 2014). However, except for *QE1* in columns [2] and [4] and *QE2* in column [2], none of the coefficients of individual QE periods are indistinguishable from zero across all specifications. In addition to different methodology employed[9], such outcome requires further investigation of the sample and the relationship between independent and outcome variables[10]. Overall, the impact of *QE1* was the largest and the impact of *QE3* was the smallest. In fact, the impact of *QE1*, on average, is associated with an increase in capital inflows by 5.20%, as demonstrated in column [4]. I also ran the same set of regressions for untransformed capital flows (Appendix, Table 4). Table 4 shows similar results, with *QE1* continuing to be the largest and statistically significant estimate among other QE episodes. Table 1 shows that *QE1* had the greatest influence on capital flows into EMEs.

Besides, to the degree that QE had an impact on the fundamentals, evidence suggests that it was transmitted across all three channels. The 3-month Treasury bills are negative and significant in columns [3] and [4], which is consistent with how QE reduced the liquidity premium and raised yields on short-term bills, which then functioned as a substitute for EMEs' assets, lowering financial inflows. The negative and highly significant coefficient of the yield curve supports the preferred-habitat theories, where investors prefer a particular segment of the yield curve. Lastly, there is evidence that confidence effects are prevailing: the coefficient on the VIX is highly significant and negative. Similar results can be observed in the untransformed capital inflows (Appendix, Table 4). Taken together, these significant variables are consistent with Lim et al. (2014) in that the measures tend to be global "push" factors of abundant liquidity (falling 3-month bill rates), portfolio rebalancing away from long bonds (a flattening yield curve), and increased confidence in risky assets (a shrinking VIX).

A. Openness of the Capital Market

Given the nature of different regulation rules implemented by different central banks, either tight or accommodative, the introduction of capital controls[11] as one of the control variables offers additional insight into the spillover effects of QE on capital inflows to EMEs and is suggested by researchers as an influential control variable to include into the analysis (Fofack et al., 2020). In fact, capital controls are the nation's protective policies to regulate the capital flow in and out of the country's capital account. Collecting and summing up 62 categories covering restrictions on capital inflows from the IMF AREAER database, I use two variables to demonstrate the level of openness of a country's capital market: 1) *CAPITAL CONTROL*, a score illustrating capital

---

[9] Lim et al., (2014) employ LSDVC and Park et al., (2014) use AB GMM. Most of the QE coefficients are statistically significant in their studies. They also incorporate a large sample including more than 60 countries.

[10] This will be discussed extensively in the next section.

[11] Capital controls or restrictions represent any measure taken by a government, central bank, or other regulatory body to limit the flow of foreign capital in and out of the domestic economy. Some measures include limits on securities, investment portfolios, controls on financial derivatives and instruments, etc. Based on the 62 categories in the IMF AREAER database, controls on capital transactions involve repatriation requirements, controls on capital and money market instruments, controls on derivatives and other instruments, etc.

restrictions ranging from 0 to 62, with 62 being the highest restriction level, and 2) *DECREASE IN OPENNESS*, a dummy variable takes the value of one if country *i* shows an increase in *Capital Control* in any of the three QE episodes and zero the opposite. Table 2 reports the same estimates produced by the FDIV method on both the untransformed capital inflows and log-transformed capital inflows. *CAPITAL CONTROL* and *DECREASE IN OPENNESS* are included to examine and account for the impact of capital restrictions.

Overall, the introduction of capital controls doesn't induce any substantial fluctuations in key estimates. The relationships between all the QE episodes and capital inflows remain positive across all specifications. The positivity and statistical significance of QE1 are continuously observed from

Table 2: Net Financial Inflows, *Capital Control Included*, 2000Q1-2013Q2

	(1) FDIV	(2) FDIV	(3) FDIV	(4) FDIV
Panel A: Untransformed Capital Inflows				
Lagged inflows	0.924***	0.903***	0.920***	0.897***
	(0.353)	(0.342)	(0.356)	(0.347)
All QE episodes	21102.2		21161.4	
	(15401.9)		(15375.8)	
QE1		24799.3**		25133.9**
		(12083.8)		(11946.8)
QE2		18084.1		18190.2
		(11873.5)		(11751.1)
QE3		19996.7		19849.9
		(20359.9)		(20329.3)
Capital Control	-25.64	-34.10		
	(404.9)	(382.7)		
Decrease in Openness			-1935.1	-2566.1
			(5820.0)	(5510.2)
Panel B: Log-transformed Capital Inflows				
Lagged inflows	0.00611	0.00836	0.0154	0.0167
	(0.0958)	(0.0976)	(0.0944)	(0.0960)
All QE episodes	1.981		1.944	
	(1.476)		(1.506)	
QE1		4.971***		4.787***
		(1.325)		(1.296)
QE2		0.580		0.580
		(1.196)		(1.155)
QE3		0.850		0.942
		(2.877)		(2.856)
Capital Control	0.237***	0.228***		
	(0.0673)	(0.0750)		
Decrease in Openness			2.853**	2.427**
			(1.184)	(1.137)
Observations	490	490	490	490

Three channels and basic controls are included but not shown due to limited space
* p<0.10, ** p<0.05, *** p<0.01

the results, where QE1 is largely associated with the increase in capital inflows to EMEs, after controlling the level of openness.

Interestingly, the signs of the two capital control variables are opposite; the two in Panel A are negative, but the two in Panel B are positive and even statistically significant. The negative relationship between capital controls and capital inflows in Panel A suggests the effectiveness of capital restrictions in limiting the flow of foreign assets into the domestic market. Whereas the sign is positive and, most importantly, significant in Panel B, supporting that more capital restrictions imposed by one country would lead to more net capital flows into the EMEs. One economic explanation is derived from the equation below:

$$Net\ Capital\ Inflows = Inflows - outflows$$

where capital restrictions also effectively limit the flow of assets out of the domestic market and thus increases net capital inflows. However, the opposite and inconsistent sign resulting from log transformation is still a mystery and requires further investigation.

VI. DISCUSSION

This paper aims to evaluate the spillover effects of unconventional monetary policy on the capital flows into ten big emerging market economies. The paper follows closely the design of the model employed by Park et al. (2014) to look at the impact of QE on the capital flows into EMEs in its use of three transmission channels and lagged inflows. The results of my research are in line with the findings of relevant studies in the field. I find that QE1 increased capital flows into EMEs by 2.97% (Table 1, column [2]) or 5.20% (Table 1, column [4]); this is consistent with Park et al. (2014)'s finding that QE1 increased capital inflows to developing countries by 2.60% when compared to other QE episodes. They also find that when the QE dummy interacts with the Asia dummy, the estimated coefficient is quite large and statistically significant, indicating that capital flows to Asian countries were especially large during QE. Table 1 shows that when the log-transformed capital inflows are adopted, the impact of QE1 on capital inflows is more positive when compared to the model using untransformed financial inflows (Table 4). The log values of capital inflows, as well as their lag inflows, can better mitigate the repercussions of large variation and suspicious outliers in the distribution of capital inflow (see Table 3 for summary statistics). Comparing two regression models (FE vs FDIV), I discovered that QE1 had a greater and statistically significant influence on capital inflows across all specifications; in particular, the coefficient of QE1 rises from 2.97 to 5.20 (Table 1, columns [2] and [4]), holding other variables constant.

As pointed out previously, QE1 is consistently significant across all models and specifications in my study, suggesting that the impact of QE1 is robust under different methodologies and introduction of control variables. However, allQE, QE2, and QE3 are only statistically significant under specific econometric methods, and it's different from previous literature looking at a large number of developed and developing countries (Lim et al., 2014; Park et al., 2014)[12]. I suspect that such a difference might be due to the sample size as well as the econometric methodology used. However, my finding is in line with Park et al. (2014) when they interact individual QE dummies with the Asian dummy and find that only the coefficient of the QE1 dummy is statistically significant, suggesting that capital flows to Asia were particularly large during QE1, but not QE2

---

[12] Most of the QE dummies are positive and statistically significant in their studies. The sample size is also big (around 60 countries).

and QE3. Overall, my findings support previous researchers' findings that there is a positive relationship between QE and capital inflows and the spillover effects of QE on capital inflows had the largest influence in QE1 and QE3 the smallest (Table 1, column [4]).

A. Limitations

One big concern in this analysis is that non-significant results, especially for QE2 and QE3, could be caused by the sample size and, most importantly, the methodology used as the lagged dependent variable introduces endogeneity. The use of the FDIV method mitigates this concern to some extent. However, the FDIV estimation method could lead to consistent but not necessarily efficient estimates of the parameters in the model because it does not make use of all the available moment conditions and does not consider the different structures of the residual disturbances (Baltagi, 2005). Arellano and Bond (1991) proposed a generalized method of moments (GMM) procedure in which the results indicate negligible finite sample biases in the GMM estimates and substantially smaller variances than those associated with the IV estimators introduced by Anderson and Hsiao (1981). Given the complexity of AB GMM, the LSDVC (bias-corrected LSDV) model was proposed as an alternative approach to the IV and GMM estimators as it is calculated as a bias correction to the LSDV estimator (Msoni, 2018). Most importantly, Judson and Owen (1999) show that the LSDVC may outperform the IV and GMM estimators for smaller panels and find strong evidence suggesting that the LSDVC performs very well when N is small. Given that FDIV is more viable and manageable for my paper, I suggest that future research can rely on the other two methodologies to further mitigate the endogeneity issue brought by lagged dependent variables.

Moreover, the conflicting sign of the coefficients on capital controls in Table 2 requires deep investigation. To my knowledge, no studies have incorporated capital restrictions as either a score or a dummy variable into the regression model when examining the spillover impact of QE. *Capital Control* is included frequently in studies discussing QE tapering (Eichengreen and Gupta, 2014; Park et al., 2014). However, the inclusion of capital restrictions is suggested by researchers as an important measure to mitigate the spillover effects of QE (Fofack et al., 2020), supporting it's being considered as one control variable. Given the concern of sample size, future studies interested in capital restrictions can incorporate a larger sample size as there is no guarantee that in small samples the FDIV estimates will possess finite second-order moments, or in other words, consistent estimates (Anderson and Hsiao, 1981).

One possible reason for the opposite sign on the estimates of capital restrictions can be traced to the log transformation. In particular, since net capital inflows involve negative values, in order to convert them to the log format without generating missing values, I log transform the absolute value first, and then put a negative sign in front of the observation where the original capital inflow is negative. This method is frequently used when log transforming negative values. Researchers also suggest scaling up to make all values positive by adding an arbitrary number and then log transform to maintain the normality of the variable[13]. This method is employed in the paper, and results are reported (Appendix, Table 7). According to Table 7, the coefficients on the estimates

[13] In this paper, I use the smallest capital inflows (-49832.7) as the "arbitrary number." The STATA command is essentially *log(capital inflows + abs (minimum) + 1)* to make sure that there are no missing variables. Through this log transformation method, there is one normal distribution in the capital inflows variable. However, the magnitude and characteristics of the former negative values are lost.

of capital controls, especially *Decrease in Openness*, are negative, supporting the theory that more capital restrictions lead to fewer capital inflows. Even though the relationships between QE episodes and capital inflows are positive, QE1 loses its magnitude and significance. Compared to the second method, taking the log of the absolute value of capital inflows (used in Table 1 and Table 2) is somewhat better as it considers the unique pattern of all kinds of capital inflows. However, no matter which method is incorporated to log transform the negative values, both two methods are criticized by researchers who have not come up with one method that addresses all concerns. Future studies should pay attention when log transforming negative capital inflows as this approach is utilized frequently by researchers (Lim et al., 2014; Park et al., 2014; Msoni, 2018).

Another explanation might be China. China has unique macroeconomic conditions and a government stance on cross-border flows. Although it embarked on a series of initiatives to liberalize its capital account in early 2000, capital controls remain largely in the segment of bank flow (Xu and La 2017). This is supported by the capital control score for China being the highest of all time in my sample, ranging between 55 and 58 out of 62. A regression model excluding China is reported (Appendix, Table 5). Even while all QE and QE2 are positive and statistically significant (Panel A), such relationships are not consistent for the log-transformed capital inflows and the issue of capital control still prevails. In general, the impact of QE1 remains the greatest.

Besides, caution should be applied when evaluating estimates for different types of investments. Given that not all flows are created equal and different forms of financial flows can be expected to respond differently to the effects of QE, a different story is expected to emerge when analyzing the composition of capital flows. Park et al. (2014) decompose capital flows into loans, bonds, equity, and FDI and find that the impact of QE is largest for loans; bonds and equity flows are more influenced by the modeled three channels. Interestingly, FDI flows are not much influenced by QE. All three channels, similar to my finding, are not statistically significant, and the coefficient of the QE dummy is even negative (Appendix, Table 6).

For future examination of the impact of QE, sample size and econometric methodology need to be paid more attention to. Because the "statistical noise" decreases with the sample size, any amount of noise can be potentially averaged out by using a large enough sample size. Studies investigating the impact of QE and employing dynamic panel models tend to have a large sample size, which greatly mitigates the variance of the response data (Lim et al., 2014; Park et al., 2014). Interestingly, Msoni (2018) examines the impact of QE on capital inflow to BRICS (small *N*) and finds statistically significant results for most of the QE variables. The primary econometric methodology Msoni (2018) used is AB GMM, where the results indicate negligible finite sample biases and substantially smaller variances than those associated with the IV estimators introduced by FDIV (Arellano and Bond, 1991). Thus, the FDIV estimation method could lead to consistent but not necessarily efficient estimates of the parameters in the model because it does not make use of all the available moment conditions (Baltagi, 2005), rendering the estimate to be non-significant. Future studies interested in the spillovers of QE should compare other econometric methods with the FDIV or have a large sample size to guarantee the efficiency of the estimates across different specifications. Overall, the positive and statistically significant coefficient on QE1 across different specifications in my paper confirms it to be the most effective QE episode that had the greatest impact on capital inflows in EMEs.

VII. CONCLUSION

During the GFC, advanced economies embarked on massive unconventional monetary expansions, epitomized by the U.S. Fed's three rounds of QE, to support financial stability and economic growth. The central objective of my paper is to empirically investigate the spillover effects of QE on capital flows into EMEs. Using country-level capital inflows data from the quarters between 2000Q1 and 2013Q2 to conduct a dynamic panel model analysis, this paper finds evidence of a positive relationship between QE and capital inflows to EMEs. In particular, my analysis reconfirms earlier studies suggesting that QE1 had a much larger, and statistically significant, effect on capital flows than QE2 or QE3. One of the policy lessons emerging from my empirical findings is that there is no evidence that countries implementing capital restrictions witnessed fewer capital inflows as the estimates demonstrate non-significant and inconsistent signs on the coefficients, but this statement can be largely qualified. While my evidence does not support the direct effectiveness of capital controls, they can still be useful preemptive measures that restrain domestic credit expansion and financial market instability caused by large capital inflows.

VIII. REFERENCES

Anderson, T. W., & Hsiao, C. (1981). Estimation of dynamic models with error components. *Journal of the American statistical Association*, *76*(375), 598-606.

Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The review of economic studies*, *58*(2), 277-297.

Baltagi, B. H. (2008). *Econometric analysis of panel data* (Vol. 4). Chichester: John wiley & sons.

Cho, D., & Rhee, C. (2013). Effects of quantitative easing on Asia: capital flows and financial markets. *Asian Development Bank Economics Working Paper Series*, (350).

Duca, M. L., Nicoletti, G., & Martinez, A. V. (2016). Global corporate bond issuance: what role for US quantitative easing? *Journal of International Money and Finance*, *60*, 114-150.

Eichengreen, B., & Gupta, P. (2014). The impact of expectations of reduced Federal Reserve security purchases on emerging markets. *Policy research working papers of the World Bank*.

Fratzscher, M., Lo Duca, M., & Straub, R. (2018). On the international spillovers of US quantitative easing. *The Economic Journal*, *128*(608), 330-377.

Fofack, A. D., Aker, A., & Rjoub, H. (2020). Assessing the post-quantitative easing surge in financial flows to developing and emerging market economies. *Journal of Applied Economics*, *23*(1), 89-105.

Gagnon, J., Raskin, M., Remache, J., & Sack, B. (2011). The financial market effects of the Federal Reserve's large-scale asset purchases. *International Journal of Central Banking*, *7*(1), 45-52.

Gebhart, J. (1997). The Big Ten: The Big Emerging Markets and How They Will Change Our Lives. *MIT Sloan Management Review*, *38*(4), 101.

Joyce, M., Miles, D., Scott, A., & Vayanos, D. (2012). Quantitative easing and unconventional monetary policy–an introduction. *The Economic Journal*, *122*(564), F271-F288.

Judson, R. A., & Owen, A. L. (1999). Estimating dynamic panel data models: a guide for macroeconomists. *Economics letters*, *65*(1), 9-15.

Kalu, E., Okoyeuzu, C., Ukemenam, A., & Ujunwa, A. (2020). Spillover effects of the US monetary policy normalization on African stock markets. *Journal of Economics and Development*.

Lavigne, R., Sarker, S., & Vasishtha, G. (2014). Spillover effects of quantitative easing on emerging-market economies. *Bank of Canada Review*, *2014*(Autumn), 23-33.

Lee, C. C., Chen, M. P., & Huang, C. C. (2020). The Effects of US Unconventional Monetary Policy On Asian Stock Markets. *The Singapore Economic Review*, *65*(04), 917-945.

Lim, J. J., Mohapatra, S., & Stocker, M. (2014). Tinker, taper, QE, bye? The effect of quantitative easing on financial flows to developing countries. *World Bank Policy Research Working Paper*, (6820).

Lubys, J., & Panda, P. (2021). US and EU unconventional monetary policy spillover on BRICS financial markets: an event study. *Empirica*, *48*(2), 353-371.

Morgan, P. (2011). Impact of US quantitative easing policy on emerging Asia.

Msoni, M. (2018). The impact of quantitative easing on capital flows to the BRICS economies.

Mukherjee, M., & Bhaduri, S. N. (2015). Spillover effects of quantitative easing: From the US to the BRICS. *Review of Market Integration*, *7*(2), 117-132.

Neely, C. J. (2010). *The large-scale asset purchases had large international effects* (pp. 1-45). St Louis: Federal Reserve Bank of St. Louis, Research Division.

Park, D., Ramayandi, A., & Shin, K. (2014). Capital flows during quantitative easing and aftermath: Experiences of Asian countries. *Asian Development Bank Economics Working Paper Series*, (409).

Tillmann, P. (2016). Unconventional monetary policy and the spillovers to emerging markets. *Journal of International Money and Finance*, *66*, 136-156.

Wei SJ. (2008) International Capital Flows. In: Palgrave Macmillan (eds) The New Palgrave Dictionary of Economics. Palgrave Macmillan, London. https://doi.org/10.1057/978-1-349-95121-5_1058-2

Xu, Y., & La, H. A. (2017). Spillovers of the United States' unconventional monetary policy to emerging Asia: the Bank lending channel. *Emerging Markets Finance and Trade*, *53*(12), 2744-2769.

APPENDIX

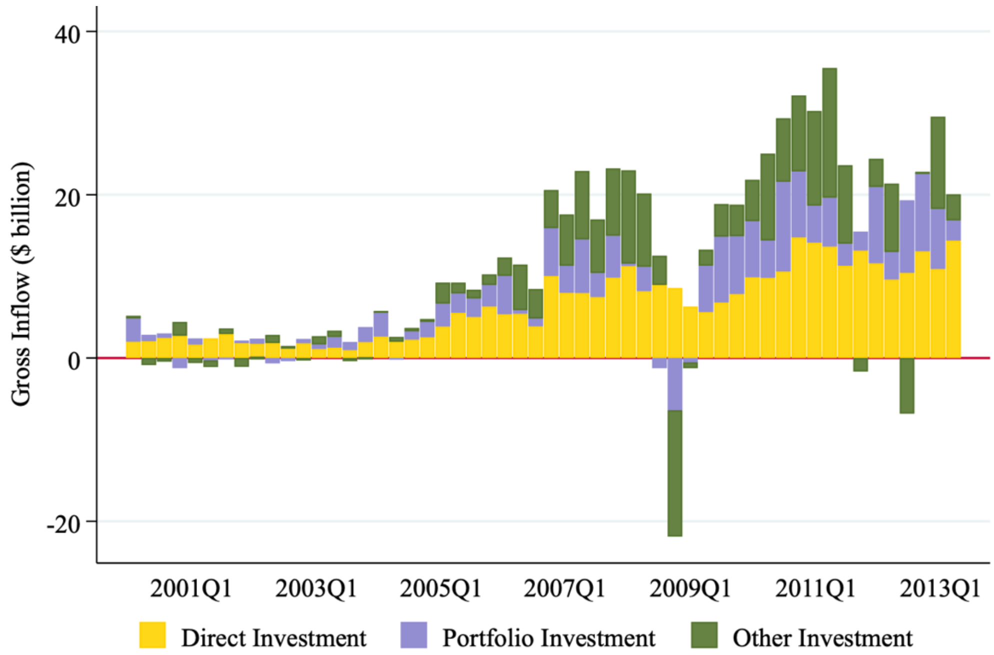

Figure 1: Quarterly Capital Inflows to EMEs, 2000Q1-2013Q2

Table 3: Summary Statistics of Key Variables

	Mean	SD	N	Min	Max
Capital Inflows	12692.49	22116.73	520	-49832.7	173548
All QE episodes	0.24	0.43	540	0	1
QE1	0.13	0.34	540	0	1
QE2	0.06	0.23	540	0	1
QE3	0.06	0.23	540	0	1
3M T-bill rate	2.02	1.95	540	0.02	6.02
Yield curve	1.88	1.25	540	-0.63	3.61
VIX	21.69	8.49	540	11.03	58.59
Capital Control	38.71	12.49	540	4	58
GDP	289605.4	312039.5	540	61316.81	1846150
Emerging GDP growth	4.84	4.15	540	-15.22	15
High-income GDP growth	1.72	1.90	540	-4.74	4.73
Country rating	5.88	1.40	540	3.70	10.08
Crisis period	0.19	0.39	540	0	1

Capital Inflows are missing for some countries at some time periods (20 cases)

Both capital inflows and GDP are reported in US$Millions

Table 4: Net Financial Inflows, (*not log-transformed*) 2000Q1-2013Q2

	(1)	(2)	(3)	(4)
	FE	FE	FDIV	FDIV
Lagged inflows	0.430***	0.430***	0.925**	0.904***
	(0.0610)	(0.0661)	(0.361)	(0.349)
All QE episodes	8131.2*		21098.5	
	(3633.5)		(15334.1)	
QE1		9425.2**		24784.4**
		(3294.9)		(11935.5)
QE2		9960.1*		18071.4
		(5044.0)		(11735.1)
QE3		3036.0		20004.8
		(3851.5)		(20426.1)
Three Channels				
3M T-bill rate	598.3	-212.2	-7560.9**	-6767.0**
	(1350.5)	(1488.3)	(3211.7)	(3270.6)
Yield curve	1105.4	-138.1	-9097.5**	-8036.3**
	(1928.9)	(2078.4)	(3558.7)	(3450.4)
VIX	-276.8***	-322.8***	-622.8***	-610.7***
	(79.53)	(92.29)	(204.0)	(204.6)
Basic Controls				
GDP	13686.8	11869.2	3311.1	15083.6
	(8796.3)	(9226.3)	(27696.9)	(31755.3)
High-income GDP growth	571.1	513.8	-688.3	-536.7
	(800.3)	(724.5)	(666.9)	(619.0)
Emerging GDP growth	-114.6	-143.6	148.0	100.5
	(209.4)	(209.3)	(339.0)	(319.0)
Country rating	-2792.7	-3407.5	-3280.0**	-3077.1*
	(2052.4)	(2085.3)	(1570.3)	(1638.1)
Crisis period	3674.7**	3525.3**	1927.3	1882.4
	(1171.9)	(1193.0)	(2852.7)	(2712.5)
Observations	510	510	490	490

Capital inflows are **NOT** in logarithmic form, but GDP-related variables are transformed.
* p<0.10, ** p<0.05, *** p<0.01

Table 5: Net Financial Inflows, (*China excluded*) 2000Q1-2013Q2

	(1) FDIV	(2) FDIV	(3) FDIV	(4) FDIV	(5) FDIV	(6) FDIV
Panel A: Untransformed Capital Inflows						
Lagged inflows	0.194*	0.194*	0.202*	0.201*	0.190*	0.187*
	(0.101)	(0.105)	(0.104)	(0.108)	(0.107)	(0.110)
All QE episodes	5596.3***		5569.9***		5628.6***	
	(1415.4)		(1486.6)		(1343.2)	
QE1		9074.6**		9036.0**		9252.5***
		(3755.7)		(3839.5)		(3436.1)
QE2		5556.2**		5500.5**		5624.6***
		(2221.2)		(2313.1)		(2148.6)
QE3		3037.7		3044.6		2990.9
		(2179.5)		(2191.9)		(2145.3)
Capital Control			189.5***	178.4**		
			(73.34)	(70.09)		
Decrease in Openness					-769.2	-1301.3
					(3445.7)	(3202.8)
Panel B: Log-transformed Capital Inflows						
Lagged inflows	0.00438	0.0100	-0.000943	0.00471	0.00906	0.0134
	(0.103)	(0.106)	(0.105)	(0.108)	(0.104)	(0.107)
All QE episodes	1.022		0.896		0.824	
	(0.993)		(0.999)		(1.006)	
QE1		4.734***		4.495***		4.256***
		(1.307)		(1.364)		(1.298)
QE2		0.532		0.360		0.334
		(1.210)		(1.266)		(1.211)
QE3		-1.296		-1.292		-1.210
		(2.016)		(2.023)		(1.978)
Capital Control			0.243***	0.233***		
			(0.0640)	(0.0726)		
Decrease in Openness					2.950**	2.458**
					(1.182)	(1.132)
Observations	459	459	459	459	459	459

* p<0.10, ** p<0.05, *** p<0.01

Table 6: Financial Inflows by Type, 2000Q1-2013Q2

	Direct Investment		*Other Investment*		*Portfolio Investment*	
	(1)	(2)	(3)	(4)	(5)	(6)
Lagged inflows	-0.169	-0.174	-0.151	-0.159	-0.107	-0.137
	(0.252)	(0.249)	(0.124)	(0.119)	(0.225)	(0.271)
All QE episodes	0.109		0.488		-0.132	
	(0.116)		(0.336)		(0.191)	
QE1		-0.0579		0.734		-0.696
		(0.182)		(1.091)		(0.697)
QE2		0.304*		0.551		-0.951***
		(0.158)		(0.502)		(0.181)
QE3		0.0894		0.408		0.361*
		(0.178)		(0.472)		(0.193)
3M T-bill rate	-0.0933	-0.130	0.485*	0.490*	-0.742*	-0.707
	(0.150)	(0.136)	(0.252)	(0.268)	(0.446)	(0.432)
Yield curve	-0.110	-0.164	0.419	0.416	-0.608*	-0.524
	(0.153)	(0.135)	(0.327)	(0.338)	(0.369)	(0.357)
VIX	-0.00254	-0.00264	0.0514*	0.0508	-0.0650*	-0.0780*
	(0.00879)	(0.00874)	(0.0290)	(0.0311)	(0.0347)	(0.0401)
Basic Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	417	417	150	150	199	199

All level variables are in logarithmic form, but rates, indices and indicator variables are untransformed
* p<0.10, ** p<0.05, *** p<0.01

Table 7: Net Financial Inflows, *capital control included*, 2000Q1-2013Q2

	(1)	(2)	(3)	(4)
	FE	FE	IV	IV
Lagged inflows	0.0385	0.0364	0.0380	0.0353
	(0.0259)	(0.0238)	(0.0257)	(0.0237)
All QE episodes	0.341*		0.344*	
	(0.191)		(0.189)	
QE1		0.684		0.701
		(0.506)		(0.507)
QE2		0.226*		0.233*
		(0.125)		(0.122)
QE3		0.169		0.166
		(0.109)		(0.110)
3M T-bill rate	-0.213	-0.158	-0.211	-0.151
	(0.147)	(0.0968)	(0.147)	(0.0941)
Yield curve	-0.286	-0.217	-0.284	-0.212
	(0.203)	(0.145)	(0.202)	(0.141)
VIX	-0.0319	-0.0300	-0.0319	-0.0298
	(0.0220)	(0.0199)	(0.0220)	(0.0198)
Crisis period	-0.0149	-0.0228	-0.0141	-0.0196
	(0.0546)	(0.0620)	(0.0527)	(0.0574)
Country rating	-0.0727*	-0.0608	-0.0756*	-0.0678
	(0.0440)	(0.0481)	(0.0431)	(0.0467)
High-income GDP growth	-0.0380	-0.0255	-0.0402	-0.0298
	(0.0495)	(0.0373)	(0.0488)	(0.0384)
Emerging GDP growth	0.0215	0.0185	0.0222	0.0197
	(0.0235)	(0.0206)	(0.0230)	(0.0206)
GDP	2.152	2.929	2.124	2.913
	(1.777)	(2.521)	(1.820)	(2.559)
Capital Control	0.000299	-0.000738		
	(0.00297)	(0.00396)		
Decrease in Openness			-0.0504	-0.104
			(0.0873)	(0.101)
Observations	490	490	490	490

All level variables are in logarithmic form, but rates, indices and indicator variables are untransfor -med. Negative values of capital control are converted by adding an arbitrary number to make all values positive.

* p<0.10, ** p<0.05, *** p<0.01