

Fed's interest rate policy and capital reversals: Empirical evidence from BRICs

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Abstract:

Capital reversals have formed several financial crisis around the world since the 1980s. However, there is no consensus among economists on whether push or pull factors are responsible for creation of capital reversal and financial crisis. Many economists including Reinhart et al. (1993), Broto et al. (2011), Fratzcher (2012), Ghosh et al. (2014b), and Pagliari & Hannan (2017) believe that push factors are the main determinants of capital outflows during a financial crisis. This group of economists has emphasized that the Fed's interest rate policy has contributed to capital reversal. While others, including Alfaro et al. (2007), Chen, Griffoli, & Sahay (2014), Broner and Ventura (2016), and Alberola et al. (2016) have underlined the importance of pull factors such as macroeconomic fundamentals, productivity, domestic saving, level of foreign reserves, and soundness of the financial system. Given these contradictory findings, this paper attempts to investigate whether the Fed's interest rate policy plays a dominant role in explaining capital reversal for BRICs countries. One of the novel features of this study is that it implements fixed effects model to control for country-specific characteristics. Using quarterly data for the period of 1987Q1-2017Q1, the estimated results suggest that the Fed's interest rate policy plays a dominant role compared to other push factors and country-specific macroeconomic fundamentals. However, real GDP and exchange rate volatility are the most important pull factors that shape capital reversals and net portfolios.

Keywords: Fed's interest rate policy, capital reversal, push factors, pull factors, macroeconomic fundamentals, exchange rate volatility.

1. Introduction:

The sensitivity of capital flow to Fed's interest rate policy has been investigated by several economists, including Broto et al. (2011), Fratzcher (2012), Ghosh et al. (2014b), and Pagliari & Hannan (2017). However, none of these studies have controlled for country-specific characteristics. Indeed, one of the novel features of this study is that it implements both OLS and Fixed Effects model to control for country-specific characteristics and differences. In addition, the study covers BRICs countries because capital reversal has plummeted these countries into a deep recession. To find out whether the Fed's interest rate policy matters more than other push and pull factors for this capital outflow we use regression models with a set of independent variables including macroeconomic fundamentals such as inflation, GDP growth, openness, real effective exchange rate, and a dummy for capital liberalization.

Graphs 1-4, represent the negative effects of Fed's interest rate policy with capital flow to China and India, but not with Brazil, and Russia. The reason for the importance of FFR to China and India's economy might be due to higher trade and financial integrations of the former economies to the U.S. economy. The econometric results of the study suggest that the FFR has a negative correlation with capital flow to the emerging economies; the higher the FFR the less capital will flow to BRICs.

One of the novel features of this study is that it uses Fixed Effect models to control for country specific characteristics. This study may have interesting results for policy makers because it can help them to dampen the effects of Fed's interest rate policy on capital reversals by improving macroeconomic fundamentals such as reducing volatility of exchange rate and bolstering economic growth.

The rest of the paper is organized as follows. Section.2 briefly reviews the literature on the determinants of capital flows. Section.3 describes the data and methodology used in this paper. Section.4 discusses the estimated econometric results. Finally, Section.5 concludes and provides some policy recommendations.

2. Literature Review

There is no consensus among economists regarding the importance of pull versus push factors for capital reversals. Though many have emphasized the importance of push factors [(Broto et al. (2011), Fratzcher (2012), Ghosh et al. (2014b), and Pagliari & Hannan (2017)], others have highlighted the crucial role of pull factors for capital flows [Alfaro et al. (2007), Chen, Griffoli, & Sahay (2014), Broner and Ventura (2016), and Alberola et al. (2016)]. This section briefly reviews the empirical studies that have investigated the determinants of capital inflows and outflows to different group of countries.

Reinhart et al. (1993) and Reinhart et al. (1996) indicate that capital inflow to Latin America in the 1990s was influenced by conditions generated outside the region, mainly by push factors. Prasad and Wei (2005) investigate the level of capital flows and concludes that one of the most important variables that have affected the level of capital flow is devaluation of RMB. Alfaro et al. (2007) emphasize the importance of domestic factors such as institutional quality and the soundness of macroeconomic policies in explaining capital flow volatility.

Broto, Díaz-Cassou, & Erce-Dominguez (2008) investigate the determinants of volatility of different types of capital flows towards emerging economies using panel data for a sample of 48 emerging and developing countries for the period of 1980 to 2006. Their result indicate that global factors have gained weight for three types of flows. Broto et al. (2011) analyze the determinants of the volatility of various types of net capital inflows to emerging markets for the period of 1980-2006. They find that global factors have become increasingly dominants relative to country-specific drivers in shaping capital flows.

Ahmed & Zlate (2014) examine determinants of net capital flow to emerging markets with quarterly data for the period of 2002:Q1 to 2012:Q2. They conclude that interest rate differentials are the most important factor for shaping capital flows. They also find there has been a change in post-financial crisis behavior, particularly for net portfolio inflows because it shows greater sensitivity to interest rate differentials. Unexpectedly, they do not find a statistically positive significant effect of the U.S. unconventional monetary policy on the capital flows to emerging markets.

Chen, Griffoli, & Sahay (2014) investigate the impact of monetary policy in advanced economies on the emerging markets. Using regression models and data for the period of January 2000 to March 2014, contrary to Ahmed & Zlate (2014) they find that U.S. unconventional monetary policy have larger spillover effects than conventional monetary policy on capital flows.

However, they find that macroeconomic characteristics of the recipient countries also matter and better macro fundamentals can dampen the effects of U.S. monetary policy shocks.

Nier, Saadi-Sedik, & Mondino (2014) investigate the determinants of capital flows to a large sample of emerging market economies. They investigate the role of global financial cycles and macroeconomic fundamentals of recipient countries and country-specific characteristics in shaping capital flows. They find that global financial cycles have become the main driver of capital flows. They also find that the effects of global financial cycles on capital flow increases with the level of financial sector development in the host country.

Ghosh et al. (2014b) find that push factors such as U.S. interest rate plays a crucial role in determining capital surges to EMDEs. However, the magnitude of capital flow towards a particular country largely depends on domestic factors such as capital account openness, and exchange rate regime.

Ahmed (2015) uses a dynamic panel framework covering 48 countries over the period 1982Q1-2006Q4 to investigate the effects of Fed's interest rate policy on capital flows. His results suggest that the liftoff effect of Fed's interest rate policy for emerging market is significantly higher than advanced market economies.

Alberola, Erce, & Serena (2016) investigate the role of international reserves as a stabilizer for international capital flows. They use regression models with cross-country quarterly data for 63 countries during 1991-2010 and find that international reserves is a leading indicator to capital outflows. They also find larger stocks of foreign reserves are associated with higher gross inflows and lower gross outflows.

Pagliari and Hannan (2017) use regression models with quarterly data for 65 countries over the period of 1970Q1-2016Q1, with independent variables such as U.S. policy interest rate, shadow interest rate, oil price, real GDP growth differentials, openness, reserves/GDP ratio, and a dummy variable for the financial crisis. Their results indicate that global factors such as U.S. GDP growth and shadow interest rate are the most important drivers of capital flow volatility. They also find that real GDP growth differentials vis-à-vis advanced economies play an important role in determining capital flow movements. In sum, their regression results indicate that push factors can be more important than pull factors in explaining capital volatility among countries.

3. Data and Methodology

3.1. Data

The quarterly data for the period of 1987Q1 to 2017Q1 have been retrieved from Federal Reserve Bank of St Louis, the World Bank, and IMF websites. Table 1. represents the list of macroeconomic variables used in the regression model.

Table 1. List of Macroeconomic Variables.

Name of Variable	Definition
<i>CA</i>	Net capital flow to BRICs
<i>FFR</i>	Effective Federal Fund Rate
<i>GDP</i>	Real GDP in the U.S. economy
<i>Inf</i>	Inflation rate in the U.S.
<i>SP</i>	S&P market index
<i>S</i>	Stock market index in the recipient country
<i>Oil</i>	Oil price (Brent crude)
<i>Open</i>	Openness in recipient country
<i>E</i>	Exchange Rate volatility in the recipient country
<i>GDPE</i>	Real GDP in the emerging economy
<i>DI</i>	Dummy variable for the capital market liberalization

3.2. Methodology

To investigate whether push factors including the Fed's interest rate policy play a dominant role in shaping capital flow to BRICs compared to country-specific characteristics and macroeconomic fundamentals, equation 1. has been estimated.

$$CA = a_0 + a_1 FFR + a_2 GDP + a_3 Inf + a_4 S \& P + a_5 S + a_6 Oil + a_7 Open + a_8 REER + a_9 GDPE + a_{10} D1$$

Equation (1)

The higher FFR is associated with lower capital inflow to emerging markets; therefore, we expect a negative relationship between the two variables. A higher real GDP in the U.S. is associated with more capital flow to emerging economies. The inflation in the U.S. economy is expected to have a positive impact on capital flow to emerging markets; therefore, we expect a positive relationship between the two variables. The S&P index has a negative impact on the capital flow to emerging markets; the higher the stock market index in the U.S. economy, the less willingness to invest abroad. However, the stock market index in the recipient country (S) has a positive impact on the level of capital flow to emerging economies. In addition, the higher the openness leads to more capital flow to the emerging markets. The real exchange rate volatility in the recipient country is expected to have a negative impact on the capital flow to emerging economies. Finally, the real GDP in the recipient country is positively associated with higher level of capital flow to that country. Finally, the dummy variable for capital liberalization is expected to have a positive impact on the capital flow.

$$a_1 = \frac{\Delta CA}{\Delta FFR} < 0 \quad a_2 = \frac{\Delta CA}{\Delta GDP} > 0 \quad a_3 = \frac{\Delta CA}{\Delta Inf} > 0 \quad a_4 = \frac{\Delta CA}{\Delta SP} < 0$$

$$a_5 = \frac{\Delta CA}{\Delta S} > 0 \quad a_6 = \frac{\Delta CA}{\Delta Oil} < 0 \quad a_7 = \frac{\Delta CA}{\Delta Open} > 0 \quad a_8 = \frac{\Delta CA}{\Delta REER} < 0$$

$$a_9 = \frac{\Delta CA}{\Delta GDPE} > 0 \quad a_{10} = \frac{\Delta CA}{\Delta D1} > 0$$

4. Results and Discussion

The estimated results for net capital flow and net portfolio presented in Table 2 with two different techniques (OLS and Fixed Effects) indicate that Federal Fund Rate plays the most dominant role in shaping the net capital flow and net portfolio compared to other push and pull factors. Indeed, our results here are consistent with those of Ahmed & Zlate (2014), Ghosh et al.

(2014b) and Pagliari and Hannan (2017) who find that global factors such as U.S. interest rate plays a dominant role in shaping capital flows to emerging markets.

Among pull factors, real effective exchange rate and real GDP in the recipient country plays the most important roles in attracting capital flows, indicating the importance of stability of exchange rate and economic growth for capital flows to BRICs. The openness also plays an important role and has a positive statistically significant effect on the net capital flow to BRICs, though it is not as important as real effective exchange rate and GDP. Interestingly enough, the coefficient for dummy variable is positive and statistically significant, indicating the importance of capital liberalization for net capital and portfolio flows to this group of countries. In addition, stock market index in the U.S. economy has a statistically negative impact on capital flow; the higher the stock market index in the U.S. economy, the less capital will flow to emerging markets. However, the stock market index in emerging market has a positive significant impact in shaping the net capital flow and portfolios. In addition, the inflation rate in the U.S. economy is positively associated with capital flow to emerging markets; though the coefficient is relatively small. Finally, the oil price does not seem to matter for capital flows to BRICs. In sum, all the independent variables together have been able to explain more than 78% of changes in capital flow and net portfolio for the emerging markets.

Table 2. Estimated Results for Net Capital Flows and Net Portfolio to BRICs countries

Independent variables	Net Capital Flow		Net Portfolio Flow	
	OLS	FE	OLS	FE
<i>FFR</i>	-0.23 (2.79)**	-0.24 (2.34)**	-0.31 (3.56)**	-0.29 (3.17)**
<i>GDP</i>	0.04 (1.78)*	0.03 (1.85)**	0.03 (1.96)*	0.03 (1.74)*
<i>Inf</i>	0.08 (3.16)**	0.07 (3.14)**	0.07 (4.25)**	0.06 (4.22)**
<i>SP</i>	-0.37	-0.27	-0.24	-0.31

	(3.79)**	(3.18)**	(3.12)**	(3.75)**
<i>S</i>	0.12 (3.17)**	0.14 (3.78)**	0.11 (2.78)**	0.10 (2.89)**
<i>Oil</i>	-0.06 (1.78)	-0.03 (1.45)	-0.07 (1.23)	-0.03 (1.45)
<i>Open</i>	0.04 (2.25)**	0.03 (2.75)**	0.03 (2.87)**	0.02 (2.35)**
<i>REER</i>	-0.14 (2.98)**	-0.16 (3.15)**	-0.17 (4.15)**	-0.18 (4.23)**
<i>GDPE</i>	0.09 (2.78)**	0.14 (2.35)**	0.12 (3.15)**	0.13 (3.76)**
<i>Dummy</i>	0.01 (2.45)**	0.03 (2.75)**	0.01 (2.17)**	0.02 (3.14)**
R-Squared	0.86	0.83	0.79	0.78
Number of Observation	124	120	124	120

5. Discussion and Policy implications

As empirical evidence for different group of countries suggest, capital flow has been very volatile during the past few decades; to find out the importance of push and pull factors in shaping the capital flows to BRICs we used OLS and Fixed Effects Model techniques. The estimated results suggest that Fed's interest rate policy plays the most dominant role for capital and net portfolio flows to BRICs compared to country-specific drivers and pull factors. However, some of pull factors such as real GDP and exchange rate volatility play important roles in attracting capital flow and net portfolios. This finding has a very important policy implication for policy makers in BRICs and shows that countries who desire to attract more capital should improve their macroeconomic fundamentals such as economic growth and dampen the volatility of real effective exchange rate. Indeed, high volatility of real exchange rate is detrimental to both capital and portfolio flows.

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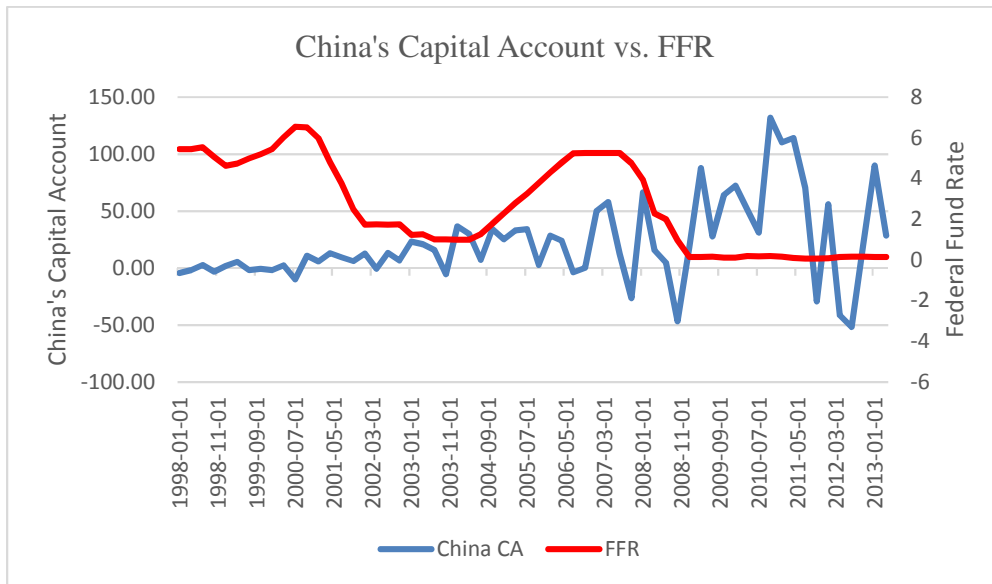
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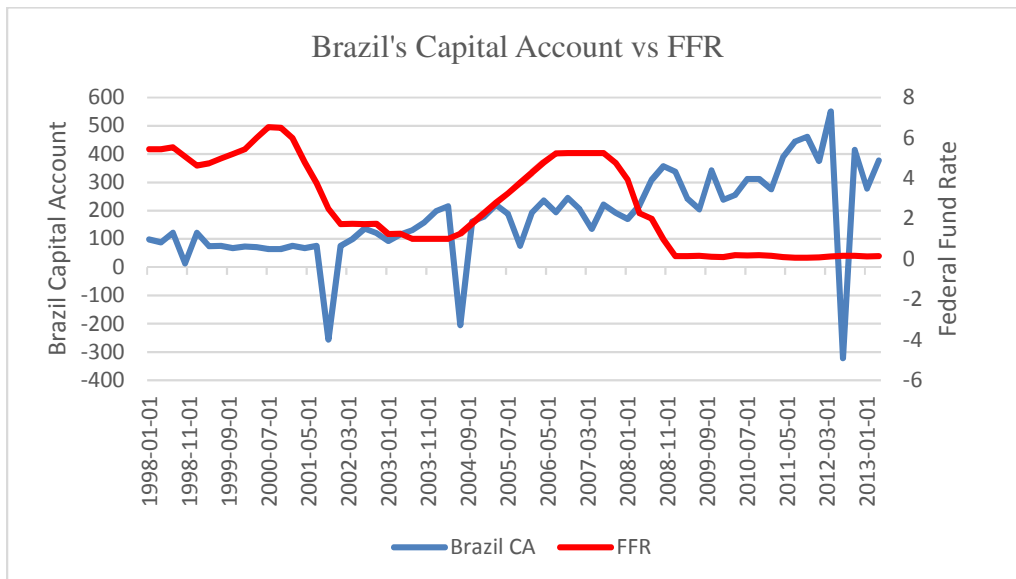
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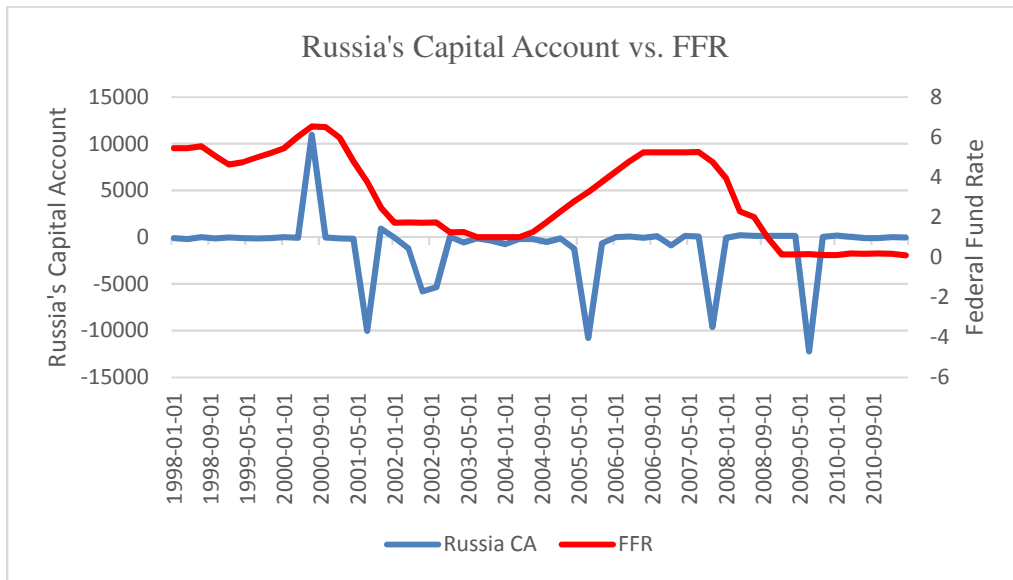
Graph1. China's net capital flow versus effective FFR



Graph 2. Brazil's net capital flow versus effective FFR



Graph 3. Russia's net capital flow versus effective FFR



Graph 4. India's net capital flow versus effective FFR

