



# THE INFLUENCE OF CAPITAL FLOW BONANZAS ON REAL AND FINANCIAL SECTORS: A COMPARATIVE STUDY OF SOUTH ASIA AND CHINA<sup>1</sup>

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## Abstract

*This paper investigates the impact of large capital flows (LCF) on real and financial sectors of selected South Asian countries and China for the period 1970-2013. In particular, we investigate the influence of episodes of large capital inflows (LCIF) and outflows (LCOF) on domestic private credits, market interest rates, exchange rates, inflation, stock prices, and GDP per capita. For this purpose, first, episodes of LCIF and LCOF, de-trended by the Hodrick-Prescott (HP) filter, are identified. Next, we estimate the impulse response function based on the local projections method (IRF-LP) to quantify the response of the underlying variables to episodes of LCF. The results suggest that massive capital flows have less positive but more negative effects on the nominal and real macroeconomic indicators for South Asian countries. Nevertheless, the results indicate that China has appeared much less vulnerable to episodes of capital flow bonanza during the same period. The findings are of great interest to policymakers for designing effective policies in order to avoid adverse effects of extreme capital flow episodes.*

**Keywords:** Capital Flow Bonanza; Inflows and Outflows; Real and Financial Sectors; South Asian Countries; China; IRF; Hodrick-Prescott Filter; Local Projections

**JEL Classification:** F41; F43; F32; O11

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<sup>1</sup> We would like to thank the independent referees and the Editor of the journal for their constructive suggestions/comments. We are also thankful to Muhammad Imran for technical assistance. The usual disclaimer applies.

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## Introduction

Since the beginning of the 20<sup>th</sup> century, there has been an active progress towards globalization, particularly, the integration of financial markets and international trade openness (Kamin, 2010). The process of globalization, deregulation, and liberalization of the financial system have in principle widened the international investment opportunity set. Indeed, owing to higher economic and financial integration, financial liberalization, and no or less capital account restrictions, both the magnitude and frequency of international capital flows have tremendously increased in the past years. More financially and economically open countries can attract more foreign capital and hence, they may invest more than they save. In theory, the economies having low domestic savings rates but with flourishing future prospects for growth and development may accumulate capital stock and finance their investment-saving deficits by foreign savings (current account deficits). The fundamental questions are whether relying on foreign savings for furthering economic growth and development is workable and beneficial and whether such policy can sustain for a long period of time.

In reality, international capital inflows have benefits as well as costs for host economies. On the one hand, large foreign capital inflows, particularly for developing and emerging countries, help to increase domestic savings, promote economic growth, and enhance living standards (Agenor, 2003). The other significant potential benefits of capital inflows are considered as risk sharing, deepen domestic financial sector, improved and more productive resource allocation, smooth consumption, and enhanced macroeconomic discipline (Agenor, 2003; Wang and Wong, 2009; Choong *et al.*, 2010; Azman-Saini *et al.*, 2010). Some scholars are also of the view that foreign savings are helpful in attaining higher sustainable economic growth, enhancing the process of integration of international financial markets, and achieving macroeconomic stability (Obstfeld, 2009; Cardarelli *et al.*, 2010).

On the other hand, massive capital inflows may disrupt inflationary dynamics and fuel exchange rate volatility, and thus, leads to increased financial vulnerability (Rashid, 2010). Moreover, large capital movements may cause appreciations of local currency, which, in turn, deteriorate international competitiveness of domestic firms (Kim and Yang, 2008; Cardarelli *et al.*, 2010; Furceri *et al.*, 2012; Caballero, 2014; Cecen and Xiao, 2014; Sethi and Sucharita, 2015). Furthermore, lack of absorptive capacity for, improper supervision, and ineffective sterilization of the received foreign capitals may deteriorate the fragile banking system of the host country and cause financial bubbles (Rashid and Husain, 2013). Analogously, large and sudden capital outflow can also severely damage the domestic economy. Particularly, large capital outflows may cause a liquidity crunch in the domestic economy and increase the probability of currency crises. Similarly, some researchers argue that a glut of international capital may cause larger imbalances in both capital and current accounts (Bernanke, 2005). Finally, economists are also of the view that foreign investments extract a considerable proportion of profits, which causes currency fluctuations and imbalances in the current account. Thus, foreign capital inflows are not free of risks (Dixon and Boswell, 1996; Kentor, 1998). There is also empirical evidence that surges in capital inflows, particularly, in terms of "foreign direct investment" (FDI), significantly lead to higher income disparities in emerging and developing economies (Herzer *et al.*, 2014). More recently, Bermejo Carbonell and Werner (2018) provide evidence of no favorable impacts of FDI on the output growth of Spain. Earlier, by incorporating the role of banks' credit creation Werner (1992, 1994, 1997, and 2012) shows that the growth-enhancing role of capital inflows (e.g., FDI) decreases significantly.

Theoretically, how foreign capital affects an economy mainly depends on the ways in which it inflows to the economy. Further, the macroeconomic effects of foreign capital also depend upon whether the inflows are long-lasting or transitory in nature. In principle, although the factors attracting foreign capital are different for different countries, the most common factors can be (i) an exogenous increase in capital productivity, (ii) an autonomous rise in money demand, and (iii) external factors, for example, declines in international rate of returns (Rashid and Husain, 2013).<sup>6</sup>

Capital influxes can be classified into three major types: FDI, foreign portfolio investments (FPI), and foreign debt (Kirabaeva and Razin, 2010). Generally, FDIs are considered to be relatively stable. The more volatile types of flows are foreign portfolio investment and debt, which includes both bonds and bank loans. In principle, these capital flows are influenced by both external (“push”) and internal (“pull”) factors that are vital in determining the movements and the magnitude of capital flows (Ying and Kim, 2001)<sup>7</sup>. For instance, Kim and Yang (2008) explained that local currency devaluation, particularly in terms of dollar, has an essential role in the movements of foreign capitals. Moreover, Mody and Murshid (2011) concluded that capital flows are larger in less volatile regimes and low in high volatile regimes. Gunter (2004) reported that current account deficit, currency overvaluation, and higher cost of financial transactions could be the main determinants of capital flight.

The associations between LCIF and economic development/growth have been subject to both empirical and theoretical examinations for many years. Savings have a vital role to play in building up capital stock and promoting economic growth in several initial models of economic growth like Harrod (1939) and Domar (1947) models. Because most developing countries suffer from a low rate of saving, scholars have suggested that foreign savings – in terms of foreign loans, FDI, and FPI – are of significance to fill saving-investment vacuums. Neoclassical models of economic growth like Solow (1956) and Swan (1956), however, provide another reason for foreign capital inflows. According to these theories, because of lower capital stock in developing countries, the return on capital would be higher, which attracts the flow of capital from developed economies. Hence, it will assist the developing economies to catch up with the rich ones. This idea also rationalizes the use of foreign investments to boost economic development and growth in developing countries. Yet, we have empirical evidence that suggests the other way around: rather than capital, technical advancement leads to higher sustainable long-run economic development.

On the flip side, consistent with exogenous growth models proposed by other than the neoclassical economists, foreign investments significantly enhance the economic growth of developing countries by transferring technology from abroad (rich countries) (Blomstrom *et al.*, 1994; Blomström and Kokko, 1998; Blomström and Sjöholm, 1999). This narrative also supports the beneficial role of foreign capital inflows for developing countries. Similarly, in endogenous growth theories propagated by Lucas (1988), Romer (1990), and Barro (1990), the contribution of technology is considered as central in economic growth process and thus,

<sup>6</sup> The first two factors are called “pull factors” and the last one is termed as “push factors”.

<sup>7</sup> The “push or external factors” are those that are beyond the control of the borrowing country such as declines in international interest rates, global equity returns, and international liquidity etc. (Ohno, 2010). Among the “pull factors or internal factors”, exogenous improvements in capital productivity, autonomous expansions in domestic money demands, macroeconomic fundamentals, policies, and institutions had been the main driving force to attract capital flows (Fratzscher, 2012).

the role of foreign investment remained justified in transferring technology and in turn, intensifying the productivity of host economies.

By reviewing the existing empirical literature, we scrutinize that several studies have emphasized on capital flows in three respects. The first strand of studies has focused to identify incidents of LCIF (see, among several others, Cardarelli *et al.*, 2010; Caballero, 2014; Benigno, Converse, and Fornaro, 2015; Qureshi and Sugawara, 2018). The second strand of research has concentrated on the determinants of LCIF and causes of sudden stops (Calvo, 1998; Calvo *et al.*, 2004; Agosin and Huaita, 2010; Forbes and Warnock, 2012; Ghosh *et al.*, 2014; Qureshi and Sugawara, 2018; Efremidze *et al.*, 2017). The third strand of research has attempted to investigate the influences of capital inflows on real and financial sectors of different economies across the globe. This group of studies can be further divided into two groups. The studies included in the first category have done volume-based analysis to investigate the normal capital inflows effects on different macroeconomic variables such as economic growth, exchange rates, and domestic prices (Borensztein *et al.*, 1998; Levine, 2005; Baharumshah and Thanoon, 2006; Alfaro *et al.*, 2010; Rashid and Husain, 2013; Janus and Riera-Crichton, 2013; Gopinath *et al.*, 2017; Chorn and Siek, 2017). The second genre of this strand of research has done episode-based analysis. In particular, these studies have examined the effects of large capital flow episodes on both real and nominal sectors of an economy (Calvo, 1998; Calvo *et al.*, 2008, Reinhart and Reinhart, 2009; Caballero, 2014; Cavallo *et al.*, 2015; Benigno, Converse, and Fornaro, 2015; Powell and Tavella, 2015; Dhar, 2017; Cavallo, Eichengreen, and Panizza, 2018). These studies are based on the inference that all inflows may not have significant macroeconomic effects. Rather, the size of capital flow significantly matters in establishing its effects on an economy. Although our work is closely linked to this strand of the literature, we extend this hypothesis by assuming that episodes of LCIF and LCOF have different impacts on the real and nominal macroeconomic indicators. We also assume that the capital flow effects on macroeconomic performance are quite different for developing and emerging economies.

Many studies on the macroeconomic effects of foreign capital inflows have focused on the impact of either net capital inflows or episodes of LCIF. However, in spite of the large amount of hits on the topic, there remain several gaps in the existing literature. For instance, there is no such research work, which has examined the comparative role of LCIF and LCOF in real and nominal sectors. Therefore, in order to abridge this gap, the prime objective of this paper is to assess the influence of episodes of LCIF and LCOF on several nominal (the domestic credit to GDP ratio, consumer price index, nominal exchange rates, share prices, and money market interest rates) and real (GDP per capita) macroeconomic indicators. Since the consideration of amounts of capital flow may offset the effects of capital influxes by the effects of capital leakages, we examine the effects of inward and outward foreign capital flows separately. Our analysis would be useful to understand the differential effects of extreme episodes of LCIF and LCOF and to investigate the role of the magnitude of capital movements in establishing their macroeconomic effects. Prior studies such as Furceri *et al.*, (2012) and Kim and Yang (2008) have pointed out the significance of the size of capital inflow in analyzing its influences. Further, capital flow bonanza episodes are likely to have different characteristics and may have more profound and clear-cut macroeconomic effects than normal capital flows do have.

Second, most of the prior studies are panel-based analysis, focusing on a panel of either developing or emerging economies while inspecting the capital inflow effects. However, the effects of capital flows on macroeconomic performance may highly rely upon the macroeconomic-financial characteristics of host economies. Hence, the possibility of

potential heterogeneity in the effects of capital flows across countries seriously calls for empirical research based on single-country analysis. Therefore, the second contribution of this paper is that the effects of bonanza capital influxes and flights are separately examined for each of the selected South Asian economies and China. Further, our selection of the sample countries allows us to do an interesting and useful comparison between the capital inflow and outflow effects on emerging economies (China and India) and developing economies (Bangladesh, Pakistan, and Sri Lanka). Finally, this paper employs more sophisticated econometric techniques, namely the Hodrick-Prescott filter and the IRFs based on “local projections method”, not only to identify episodes of large capital flows but also to investigate how real and financial sectors of the countries under study respond to extreme capital inflows and outflows. This paper is, to our knowledge, one of the first studies on a comparative investigation of the effects of episodes of LCIF and LCOF on real and nominal sectors of the host economy for emerging and developing countries. To perform the empirical examination, the paper uses three different measures of capital flows (“foreign exchange reserves”, “net foreign assets”, and “capital account surpluses”, all are scaled by gross domestic product) of the respective countries and annual data covering the period 1970-2013. The use of three measures enables us to examine whether the applications of capital flows for macroeconomic performance vary across different indicators of foreign capital flows.

The findings of the paper suggest that episodes of large capital inflows and outflows have considerable differential impacts on selected macroeconomic indicators in all the examined countries. The results also suggest that different types of foreign capital flows used in the study have very different impacts on the underlying macroeconomic performance indicators. Finally, the results indicate that the response of macroeconomic indicators to episodes of LCIF and LCOF is quite different in emerging economies as compared to developing economies. Specifically, the empirical results suggest that the emerging countries, both China and India, have been able to minimize, at least to some extent, the negative impacts of episodes of LCIF and LCOF. On the other hand, the developing countries, particularly Bangladesh and Pakistan, have appeared more likely to suffer from the adverse impact of large capital flow surges. However, Sri Lanka, even though is a developing nation, has been able to sustain the adverse impacts of the influx of foreign capital during the study period. Finally, the results suggest that China has suffered much less from the adverse impact of a capital flow bonanza during the same period. Such results for China may highly be attributed to its strict economic and financial policies, particularly regarding foreign capital mobility and exchange rates.

The rest of the paper is structured as follows. Section 1 reviews the existing empirical literature. Section 2 explains the empirical framework, methodology, and data. Section 3 discusses the empirical results followed by Section 4, which concludes the study by providing some policy recommendations.

## **1. Literature Review**

There is voluminous literature available on the impact of LCF on the economic performance of both developed and developing countries. In particular, the impact of LCF on economic growth is examined most widely. The prior literature on the effects of capital inflows can be classified into two strands. The first strand documents the positive effect of LCIF on economic growth in less developed countries (Gupta, 1970). The literature identifies that capital inflows supplement domestic resources and fill saving-investment gaps. Capital

inflows also increase foreign reserves in the host economy. Moreover, foreign capital inflows in the form of FDI bring better managerial skills, efficient technology, and access to foreign markets (Over, 1975). In a similar vein, Shaheen *et al.*, (2013); Banerji (2013); Babalola *et al.*, (2012); and Raza *et al.*, (2011) have concluded that LCIF trigger economic growth in developing world. In addition, Adams (2009); Choong *et al.*, (2010); Azman-Saini *et al.*, (2010); Babalola *et al.*, (2012); Raza *et al.*, (2011) suggested that LCIF, particularly an increase in FDI, can positively affect economic growth of the host country.

Researchers also explain that FDI can increase employment opportunities, reduce spoilage, and also enable affordable products in developing countries (Fu and Balasubramanyam, 2005; Banerji, 2013). Another study by Chigbu Ezeji (2015) also provided evidence supporting the favorable impact of LCIF such as FDI, FPI, foreign borrowing, and remittances on the economic growth of selected developing countries. Likewise, Chorn and Siek (2017) provided insightful evidence that FDI and ODA (official development assistant) inflows have a positive impact on the economic growth of developing countries but not without constraints. Recently, Mowlaei (2018) has conducted a comparative analysis of three types of capital inflows (CIFs) for selected African countries and concluded that among ODA, FDI, and personal remittances, personal remittances have the strongest impact on economic growth of these countries.

The other strand of the literature, contrarily, documents mainly an adverse impact of capital inflows on economic growth. For instance, it is argued that CIFs hamper economic growth through various channels such as misallocation of resources, instigating corruption, distorting savings, and disturbing monetary policy effectiveness (Griffin and Enos, 1970; Meng *et al.*, 2018). Moreover, Meissner (2013) suggested that countries that are highly dependent on foreign capital inflows are more likely to experience higher volatility in economic growth as compared to countries with less capital imports. Similarly, Sadig (2013) and Chang (2010) asserted that outward FDI decreases domestic investments, economic growth, and consequently exports in the country. However, Khan (2012) has explained that the negative effect of outward FDI depends on the size of outflow.

The literature also reports that the effect of foreign capitals on the host country largely depends on the way it flows into the economy (Kim and Yang, 2008; Rashid and Husain, 2013; Combes *et al.*, 2012). The studies included in this genre have documented that the increased inflows may lead to monetary consequences (Shaheen *et al.*, 2013) and large appreciation in domestic currency that may direct to Dutch disease (Lopez *et al.*, 2007), higher inflation (Shaheed and Ayodeji, 2012; Haiyue, 2013; Nazir *et al.*, 2012), lending and assets boom (Furceri *et al.*, 2012; Lopez *et al.*, 2007; Kim and Yang, 2008), and risk to financial stability (Tillman, 2013; Nazir *et al.*, 2012; Combes *et al.*, 2012; Rashid and Husain, 2013). Particularly, Rashid (2010) and Rashid and Husain (2013) have found that capital inflows create inflationary pressures and also fuel volatility in exchange rates. However, according to Haque *et al.*, (1997), if the exchange rate is relatively flexible, then capital inflows will not greatly and significantly affect the level of inflation in the host country. Combes *et al.*, (2012) report that CIFs generally cause to significantly increase domestic inflation under the fixed exchange rate regime, whereas, are more likely to increase the exchange rate volatility under the flexible exchange rate regime. On the other hand, some other studies have suggested that large capital outflows lead to exchange rate depreciation (Cheung *et al.*, 2012; Edwards, 2008; Kuang, 2008).

Calderon and Kubota (2012) suggested that bad and unnecessary credit booms mainly occur when foreign capital inflows of a country are dominated in trade credits, currency and deposits, and other financial transactions. According to Powell and Tavella (2015), the

nature of the capital surge is vital to determine the risk associated with it. If the countries have high portfolio inflows, especially banking inflows and debt inflows, it is a major cause of concern. Rehman and Ahmed (2016) found an adverse impact of net capital inflows such as net external debt, and net ODA on the economic growth of developing countries.

The review of the above studies indicate that the existing empirical findings regarding the impact of capital flows on economic performance of developing countries are mix at best. Specifically, some studies have documented positive, whereas, some others have reported either negative or insignificant effects of capital inflows on economic growth. The prior studies have also highlighted that the impact of capital flows are different in the short run and in the long run as well as for developed and developing countries.

There can be two major reasons for such findings. First, most of these studies have considered the volume of inflow of foreign capitals as the main variable of interest while examining its impact on economic performance. However, the economic theory tells that the size of capital inflows matters a lot in establishing the effect of capital flows on economic activities. Secondly, almost all studies have examined the effect of either gross or net capital inflows on economic indicators. Using net capital flows may balance out the effect on the real and nominal sector of the economy. Furthermore, the theory suggests that both capital inflows and outflows may have quite different effects on an economy. Therefore, for better, in-depth, and complete understanding, it would be worthwhile to separately examine the effects of capital inflows and outflows on real as well as nominal sector of the host countries. It would also be useful to do a comparison of the influences of episodes of large capital flows on macroeconomic performance for emerging and developing countries. Further, since there is potential heterogeneity in the capital flow effects across countries, compared to panel-based estimation, single-country based empirical analysis would be more insightful to enhance our understanding of the underlying topic. The study in hand is an attempt to fill these gaps.

## 2. Empirical Framework

### 2.1. Variables and Data Sources

The empirical analysis of this paper is based on an annual dataset for the period 1970-2013. We have selected four South Asian countries, namely Bangladesh, India, Pakistan, and Sri Lanka, and China for empirical analysis. The data on all the variables are taken from International Financial Statistics (IFS) database managed by the International Monetary Fund (IMF). Detailed data description and unit root test results are given in Online Appendix.

### 2.2. Empirical Framework

#### 2.2.1. Identifying Episodes of Large Capital Flows

Cardarelli *et al.*, (2010) and Furceri *et al.*, (2012) classified the episodes of LCIF by calculating the deviation of the net capital inflow to GDP ratio from its historical trend. We follow these two studies in order to identify capital flow bonanzas. Since the unpredictability involved in net CIFs can oscillate across different countries, the sudden and large episodes of capital flow are relative to not only their trend in each country during that period, but also to the volatility of episodes that the country experienced in general. Therefore, an episode of large net CIFs in a year  $t$  is identified when the indicator variable  $D_t^{inflow}$  equals 1 according to the following rule:

$$D_t^{inflow} = \begin{cases} 1 & TDev_t > +\sigma_{TDev} \text{ and } \frac{NF_t}{GDP_t} > 1\% \\ 0 & \text{otherwise} \end{cases} \quad (1)$$

where  $NF_t$  is the net foreign CIFs and  $TDev_t = (\frac{NF_t}{GDP_t})$ -trend is the deviation from the historical trend. The  $\sigma_{TDev}$  is the standard deviation of detrended net foreign CIFs. Each episode is associated with a series of years in which this criterion is met. If between the two episodes, there is only one year where  $D_t^{inflow}$  equals 0 and the net foreign CIFs to GDP ratio is positive, we consider the combination of these two episodes equals to a single episode.

After describing the episodes of significant surges in CIFs, this study would also identify the episodes of LCOF. Therefore, the episode of large net capital outflow in year  $t$  is identified when the indicator variable  $D_t^{outflow}$  equals 1 according to the following rule and otherwise zero:

$$D_t^{outflow} = \begin{cases} 1 & TDev_t < -\sigma_{TDev} \text{ and } \frac{NF_t}{GDP_t} < -1\% \\ 0 & \text{otherwise} \end{cases} \quad (2)$$

As explained above, if between the two episodes there is one year where  $D_t^{outflow}$  equals 0 and the net capital outflows to GDP ratio is negative, we consider the combination of these two episodes equals to a single episode.

### 2.2.2. Empirical Model

The next step is to empirically estimate the impact of large capital flow episodes on the underlying real and financial indicators. Following Jorda (2005), Furceri and Zdzienicka (2010), and Furceri *et al.*, (2012), the impulse response functions are estimated to study the capital flow effects. Specifically, we estimate IRFs based on the extended local projections (LP) method proposed by Teulings and Zubanov (2014). The first time, the LP estimator was developed by Jorda (2005). It was initially proposed for vector autoregressive (hereafter VAR) model. Later on, it was augmented for a nonstationary VAR by Chong *et al.*, (2012). Finally, Teulings and Zubanov (2014) corrected the bias in the LP estimator by including the event occurring within the forecast horizon in the LP specification.

According to Jorda (2005), the advantages of local projections method<sup>8</sup> are numerous: i) they are based on univariate regression techniques and thus, easy to compute by using variety of statistical packages; ii) misspecification can be contained as they are more robust; iii) joint analytical inference is simplified; iv) they easily accommodate testing on nonlinear specifications; v) as they are a subset of the slope coefficient estimates, the projections are easily produced. In a similar vein, Tsay (1993), Lin and Tsay (1996), Bhansali (1996, 1997), and Ing (2003) have also reported that direct forecasting outperforms relative to other alternates such as iterated forecast models with very short lag length. Therefore, to examine

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<sup>8</sup> "Local projections are based on chronological regressions of the endogenous variable shifted several steps ahead and therefore have many points of commonality with direct multi-step forecasting". Said differently, in local projections, for each period of interest, the parameters of the model are re-estimated rather than doing forecast for increasingly distant horizons from given models.



the impact of LCIF (LCOF) on real and nominal macroeconomic indicators, the IRF in local projections framework is described as follows:

$$y_{t+k} = \delta_{0k} + \delta_{0k}^* t + \sum_{r=1}^R \delta_{1rk} y_{t-r} + \sum_{l=0}^L \delta_{2lk} d_{t-l}^{inflow} + \sum_{l=0}^{k-1} \gamma_{1l} d_{t+k-l}^{inflow} + v_{t+k}^* \quad (4)$$

$$y_{t+k} = \delta_{0k} + \delta_{0k}^* t + \sum_{r=1}^R \delta_{1rk} y_{t-r} + \sum_{l=0}^L \delta_{3lk} d_{t-l}^{outflow} + \sum_{l=0}^{k-1} \gamma_{2l} d_{t+k-l}^{outflow} + v_{t+k}^* \quad (5)$$

$$v_{t+k}^* = \sum_{m=0}^{k-1} \eta_m u_{t+k-m} + u_{t+k} \quad (6)$$

where  $y_t$  indicates the dependent variable, in our case, one of the macroeconomic indicators, and  $k = 1, \dots, 10$  denotes future period for forecast.  $d_{t-l}^{inflow}$  [ $d_{t-l}^{outflow}$ ] is the lagged values of the dummy of episodes of large capital inflows [outflows]. It is an indicator variable taking the value 1 at the start of an inflow (outflow) episode and otherwise zero,  $\delta_{0k}$  represents the country fixed effects and  $t$  represents the time trend.  $\delta_{1rk}$  indicates the persistence of the dependent variable,  $\delta_{2lk}$  [ $\delta_{3lk}$ ] explores the impact of lagged values of episodes of large inflows [outflows] on the change in real and nominal variables for the each future period  $k$ , whereas,  $\gamma_{1l}$  [ $\gamma_{2l}$ ] measures the impact of lead values of episodes of large inflows [outflows] on the change in real and nominal sectors' indicators. Specifically, these parameters measure the influence of the episodes occurring within the prediction horizon (between  $t$  and  $t+k$ ).  $v_{t+k}^*$  is the error term. It is conditional upon the information available regarding the occurrence of episodes at time  $t$  and the information on the incidence of large capital flow surges between  $t$  and  $t+k$ .  $u_{t+k}$  is the idiosyncratic error, having zero mean and constant variance. Further, it is not correlated with the regressors and is identically distributed across years.

Likewise, the combined impact of episodes of large capital inflow and outflow on the underlying variables is modeled as follows:

$$y_{t+k} = \delta_{0k} + \delta_{0k}^* t + \sum_{r=1}^R \delta_{1rk} y_{t-r} + \sum_{l=0}^L \delta_{2lk} d_{t-l}^{inflow} + \sum_{l=0}^{k-1} \gamma_{1l} d_{t+k-l}^{inflow} + \sum_{l=0}^L \delta_{3lk} d_{t-l}^{outflow} + \sum_{l=0}^{k-1} \gamma_{2l} d_{t+k-l}^{outflow} + v_{t+k}^* \quad (7)$$

Based on the LP method, we estimate IRF(k) directly by estimating the local projections equation (7) to see the joint impact of episodes of large capital inflows and outflows on the underlying variables for each  $k$  period ahead. Estimation of this equation also enables us to compare the influence of large capital inflow and outflow episodes in a single equation framework. Each specification includes four lags of the dependent variable and four lags of large capital inflow and outflow indicators/dummy variables ( $R=L=4$ ). Notably, we statistically test all these specifications.

### **3. Empirical Results**

In this section, we present the response of each real and nominal sector variables to the episodes of large capital inflows and outflows.<sup>9</sup>

#### **3.1. Response of Macroeconomic Indicators to Capital Inflows and Outflows**

The subsection presents and discusses the empirical findings for the impact of large capital inflow and outflow surges on selected real and nominal macroeconomic indicators. The results are reported in Tables 1-5 for Bangladesh, India, Pakistan, Sri Lanka, and China. Each table consists of two panels. Panel A presents the impact of episodes of large capital inflows while Panel B lists the impact of surges of large capital outflows.<sup>10</sup>

The jointly estimated IRFs of real and nominal sector variables to the surge in FRR and NFAR inflows and outflows for Bangladesh are presented in Table 1 and Table B1. Looking at the estimates, we find that both CPI and NER respond neither to the large inflow of FRR nor to the large outflow of FRR. On the other hand, we find that MMR negatively and significantly responds to FRR inflows, whereas, it positively responds to FRR outflows at the 4<sup>th</sup>, 7<sup>th</sup>, and 8<sup>th</sup> period. Interestingly, although stock prices do not significantly respond to FRR inflows, they are negatively affected by the FRR outflows. We also note that out of 10 periods under consideration, stock prices are more negatively affected by episodes of large capital outflow at the 4<sup>th</sup> time period. These findings generally speak in favor of the view that the exchange rate regime and the degree of current account openness are crucial in formulating the impact of foreign capitals on the economy of the host country.

Another interesting finding is the response of GDP to FRR flows. The estimates suggest that GDP is positively and significantly affected by large FRR inflow surges. On the other hand, although the response of GDP to large FRR outflow episodes is negative, it is statistically insignificant during the entire period under study. Since foreign capital outflow reduces the availability of financial resources for investment and other economic activities, it has an adverse impact on the GDP of recipient countries. Chang (2010) also reported similar findings, indicating that foreign capital outflows have had an adverse impact on the GDP growth of developing countries. We also observe that the variable DCG significantly responds to large inflows as well as outflows of FRR. Specifically, the response of DCG to large inward flows of FRR is positive and significant. In contrast, DCG negatively and significantly responds to large FRR outflows in the first five periods. These findings ensure the differential response of the real and nominal macroeconomic indicators to foreign capital inflows and outflows.

The results reported in Table B1 indicate that both real and nominal sector variables do not generally significantly respond to episodes of large NFAR inflows as well as outflows in Bangladesh. Only some exceptions can be noticed in the case of CPI and DCG. Both of these variables negatively and significantly respond to episodes of large NFAR outflows at certain time periods. Notably, as far as the joint impact of large CAR inflows and outflows

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<sup>9</sup> We have also estimated equations (4) and (5). However, the results are not presented here to economize on space. The results are generally similar to the results of equation (7) and are available from the authors.

<sup>10</sup> The results for NFAR and CAR are given in Table B1-B8 in Online Appendix.

are concerned, we cannot estimate the underlying variables' responses to episodes of large inflows and outflows because by using equation (2) we have not found any episodes of large CAR flows.

**Table 1**

**The effects of FRR inflows (Panel A) and outflows (Panel B) on real and nominal sectors of Bangladesh**

**Panel A: Inflows Effect**

K	CPI	NER	MMR	SP	GDP	DCG
1	0.009	-0.042	-0.011	0.204	0.047	0.048***
2	0.002	-0.006	-0.016*	0.256	0.097**	0.064**
3	0.010	-0.029	-0.017	0.180	0.078*	0.076**
4	0.046	-0.059	-0.047***	0.084	0.135***	0.070**
5	0.073	-0.071	-0.008	0.036	0.066*	0.097**
6	0.080	0.000	-0.037**	-0.104	0.059*	0.148***
7	0.069	-0.013	-0.040***	-0.161	0.051*	0.178***
8	0.041	-0.017	-0.019	-0.208	0.065**	0.196**
9	0.000	-0.030	-0.012	-0.111	0.050*	0.187***
10	-0.008	-0.017	-0.018*	-0.071	0.035	0.220***

**Panel B: Outflows Effect**

K	CPI	NER	MMR	SP	GDP	DCG
1	-0.020	0.037	0.002	-0.023	-0.015	-0.049**
2	-0.019	0.165**	0.006	-0.154	-0.057	-0.090***
3	-0.036	0.116	0.001	-0.556*	-0.038	-0.083**
4	-0.031	0.046	0.008**	-0.832**	-0.010	-0.077*
5	-0.022	0.004	0.001	-0.565	-0.004	-0.101**
6	-0.021	0.006	0.001	-0.378	-0.001	-0.041
7	-0.074	-0.049	0.005**	-0.137	-0.042	-0.045
8	-0.091	-0.018	0.008***	-0.538*	-0.021	-0.048
9	-0.102	0.031	0.007	-0.641*	-0.007	-0.057
10	-0.122	0.054	0.008	-0.647*	-0.026	-0.054

Note: GDP is stands for Gross domestic product per capita while DCG= Domestic credit growth, NER= Nominal exchange rate, CPI= Consumer price index, MMR= Market interest rate, and SP= Share prices. The \*\*\* indicates significance at 1 percent, \*\* at 5 percent, and \* at 10 percent level of significance, respectively.

Next, the joint estimated responses of selected variables to episodes of bulk in capital inflows and outflows for India are presented in Tables 2, B2, and B3. The results show a significant and negative response of NER to large FRR inflows at the 7<sup>th</sup> to 10<sup>th</sup> periods. The estimates suggest that the negative impact of FRR inflows on NER increases in the long run. The estimates of IRFs indicate that the other variables do not significantly respond during periods of large FRR inflows with an exception of DCG, which significantly and positively responds to FRR inflow bonanzas at the 5<sup>th</sup>, 6<sup>th</sup>, and 10<sup>th</sup> periods.

The estimated IRFs for large FRR outflows provide evidence that the variable NER positively and significantly responds in the short run. However, stock prices, GDP, and GCD negatively and significantly respond to episodes of large FRR outflows during the examined period. As far as the response of real and nominal sector variables to episodes of large NFAR is concerned, we observe that while CPI and DCG positively and significantly respond to NFAR outflows, the response of NER is negative and significant. We also find that the response of

CPI to the large outflows of NFAR is negative in the short run. Yet, MMR positively and significantly responds to NFAR outflows in both the short and long run. The short-run response of DCG to episodes of large NFAR outflows is also negative and statistically significant.

**Table 2**

**The effects of FRR inflows (Panel A) and outflows (Panel B) on real and nominal sectors of India**

**Panel A: Inflows Effect**

K	CPI	NER	MMR	SP	GDP	DCG
1	0.009	-0.001	-0.035	0.012	0.010	0.001
2	0.011	-0.086	-0.095	0.005	0.023	0.010
3	0.008	-0.125	-0.017	0.122	0.012	0.025
4	0.016	-0.179	-0.011	0.062	0.046	0.018
5	0.011	-0.239	-0.102	0.017	0.014	0.070**
6	0.015	-0.133	-0.265	-0.139	-0.004	0.054*
7	0.024	-0.456**	-0.080	-0.210	0.044	0.031
8	0.022	-0.528**	-0.001	-0.152	0.001	0.044
9	0.012	-0.609**	-0.081	-0.156	0.016	0.036
10	0.007	-0.644**	-0.016	-0.136	0.003	0.057*

**Panel B: Outflows Effect**

K	CPI	NER	MMR	SP	GDP	DCG
1	-0.013	0.121***	0.043*	0.187	-0.009	-0.073**
2	-0.003	0.162**	0.053**	0.164	-0.034	-0.032
3	-0.005	0.210**	0.034	-0.216*	-0.035	-0.049
4	-0.026	0.206	0.042	-0.311**	-0.002	-0.014
5	-0.020	0.173	0.075	-0.263	-0.043	-0.057
6	-0.032	0.245	0.035	-0.417**	-0.056*	-0.107***
7	-0.036	0.093	0.108	-0.201	-0.072**	-0.092***
8	-0.009	0.016	0.032	-0.152	-0.012	-0.128***
9	-0.047	-0.119	0.011	-0.179	-0.045	-0.108***
10	-0.056*	-0.106	-0.018	-0.052	-0.069	-0.081**

Note: GDP is stands for Gross domestic product per capita while DCG= Domestic credit growth, NER= Nominal exchange rate, CPI= Consumer price index, MMR= Market interest rate, and SP= Share prices. The \*\*\* indicates significance at 1 percent, \*\* at 5 percent, and \* at 10 percent level of significance, respectively.

Looking at the results for the impact of CAR flows we find that the response of NER to CAR outflows is positive in the long run. Notably, MMR negatively and significantly responds to CAR inflows, whereas, it positively and significantly responds to episodes of large CAR outflows in the long run. Finally, we observe that the response of DCG to episodes of large CAR outflows is negative in the short run. Cardarelli *et al.*, (2010) reported an appreciation in exchange rates in response to capital inflow bonanzas. Further, they found that foreign capitals help increase the GDP growth of emerging countries in the short run. Choong *et al.*, (2010) explained that stock prices could be an important mechanism through which an adverse (negative) impact of capital flows on economic growth can be converted into favorable (positive). On the other hand, Khan (2012) asserted that the negative effect of outward FDI on Indian economy largely depends on the size of outflow.

The estimates of IFRs for Pakistan are reported in Tables 3, B4, and B5. We find that several indicators of both real and nominal sectors significantly respond to large FRR inflows and

outflows. However, the response of the said macroeconomic variables/indicators to episodes of large FRR inflows and outflows is quite different. For instance, CPI significantly and positively responds to large FRR inflows, both in the short run as well as in the long run, whereas, it significantly and negatively responds to large FRR outflows during the entire projected period. Similarly, we observe that surges of large FRR inflows have a positive and statistically significant impact on stock prices, whereas, episodes of large FRR outflows have a negative and significant impact on stock prices. We can also observe from the estimates that the response of stock prices to large FRR flows is higher in the long run than in the short run. In addition, both GDP and DCG positively and significantly respond to bonanzas in FRR inflows, although GDP strongly responds in the long run while the response of DCG is higher in the short run. On the other hand, both of these variables negatively and significantly respond to episodes of large FRR outflows. Nevertheless, the response of NER to large FRR inflows is negative and significant, whereas, FRR outflow surges do not have any statistically significant impact on NER.

**Table 3**

**The effects of FRR inflows (Panel A) and outflows (Panel B) on real and nominal sectors of Pakistan**

**Panel A: Inflows Effect**

K	CPI	NER	MMR	SP	GDP	DCG
1	0.051**	-0.209***	-0.007	0.042*	0.012	0.048**
2	0.132***	-0.352***	-0.002	0.103**	0.006	0.068**
3	0.193***	-0.432***	-0.025	0.149**	0.081*	0.095***
4	0.225***	-0.507***	-0.036	0.162**	0.088*	0.103***
5	0.337***	-0.513***	-0.033	0.307***	0.105*	0.113***
6	0.390***	-0.514**	-0.119	0.342***	0.121**	0.096*
7	0.427***	-0.515**	-0.179	0.383***	0.129***	0.089
8	0.497***	-0.562**	-0.087	0.461***	0.133***	0.151
9	0.502***	-0.614**	-0.057	0.501***	0.157***	0.134
10	0.472***	-0.606***	0.009	0.509***	0.116*	0.013

**Panel B: Outflows Effect**

K	CPI	NER	MMR	SP	GDP	DCG
1	-0.045**	0.046	0.006	-0.041*	-0.052**	-0.032*
2	-0.080*	0.120*	0.002	-0.071	-0.118***	-0.053**
3	-0.136**	0.136	-0.009	-0.121*	-0.092**	-0.061**
4	-0.198***	0.143	-0.016	-0.185**	-0.082*	-0.064*
5	-0.285***	0.148	-0.013	-0.261***	-0.059	-0.106***
6	-0.322***	0.072	0.028	-0.298***	-0.100**	-0.111***
7	-0.372***	0.067	0.011	-0.419***	-0.117***	-0.102**
8	-0.414***	0.023	-0.011	-0.461***	-0.142***	-0.097
9	-0.422***	-0.036	-0.001	-0.487***	-0.120***	-0.067
10	-0.415***	-0.033	-0.017	-0.500***	-0.094*	-0.040

Note: GDP is stands for Gross domestic product per capita while DCG= Domestic credit growth, NER= Nominal exchange rate, CPI= Consumer price index, MMR= Market interest rate, and SP= Share prices. The \*\*\* indicates significance at 1 percent, \*\* at 5 percent, and \* at 10 percent level of significance, respectively.

Turning to the effects of NFAR on real and nominal variables in Pakistan, we find that CPI, SP, and DCG all the indicators positively and significantly respond to large NFAR inflow

surges only in the short run. Analogously, the response of NER to large NFAR inflow episodes is positive and significant but also only in the short run. When we look at the responses of the underlying variables to large NFAR outflows we find that both GDP and DCG respond negatively. However, we observe that the response of GDP is statistically significant in the long run, whereas, the response of DCG is statistically significant only in the short run. The estimated IRFs regarding NER and CPI reveal that NER positively and significantly responds to episodes of large NFAR outflows, whereas, the response of CPI is negative and significant only in the short run. MMR and SP do not significantly respond to large NFAR outflows. Finally, we find that the impact of large CAR inflows is only significant for NER and GDP. Similarly, only CPI and MMR significantly respond to large CAR outflows.

These results have been strongly proved in the previous researches including Sohrabji (2011), Athukorala and Rajapatirana (2003), Rashid and Husain (2013), and Kim and Yang (2008). Even though the results are not significant for MMR, they still show that there has been a substantial decrease in the interest rate due to foreign reserve inflow surges. One can also see from the estimation results that in the short run, DCG shows highly significant responses to large capital inflows. Similarly, GDP per capita is also showing significant responses to foreign capital inflow bonanzas just after nearly two years.

The results reported in Panel B of Table 3 indicate the response of the mentioned variables to episodes of large FRR outflows. The estimated estimates of IRF for CPI, SP, GDP, and DCG are highly statistically significant. Specifically, we find that these variables are significantly negatively affected by large FRR outflow episodes. Both CPI and SP persistently, negatively, and significantly respond to episodes of large FRR outflows. These findings strongly support the view that when large FRR flows outward, the demand for domestic financial assets, particularly, stocks and consumer goods and services decreases, which leads to a decrease in the rate of inflation in the economy. The results also show that the decreased FRR significantly depreciates the rupee for a certain time period. Finally, we observe that episodes of large FRR outflows not only significantly reduce DCG but also decrease per capita GDP of the country.

The fear of financial crisis, uncertain government policies, poor economic conditions, and a fragile financial environment has really caused Pakistan's foreign exchange reserves to decline during the examined period. However, the results regarding the response of the selected indicators to the declined FRR are highly significant. For instance, the results indicate that the responses of DCG are highly statistically significant up to the 7<sup>th</sup> period. These findings suggest that sudden and large declines in foreign reserves have significantly reduced banks' ability to lend, which, in turn, severely adversely affected the DCG in the country. By comparing the joint impact of episodes of large FRR inflows and outflows on the underlying variables, it can be clearly observed that both real and nominal macroeconomic indicators show significant responses to FRR movements. As far as the impact of episodes of large NFAR and CAR flows on the underlying variables is concerned, we note that the results are not highly statistically significant (see Tables 7 and 8). Therefore, we can say that in the case of Pakistan, foreign reserves have had a vital role to play in determining the real and nominal macroeconomic performance of the economy.

The estimates of IRFs for Sri Lanka are presented in Tables 4, B6, and B7. Generally, we do not find any significant response of real and nominal sectors to surges in foreign capital flows. However, we observe some exceptions. For example, per capita GDP growth responds positively and significantly to episodes of large FRR inflows only in the long run. On the other hand, DCG responds positively and significantly to large FRR inflows in the short run. Another exception is the positive and significant response of DCG to large NFAR

inflows in the short run. Finally, we find that NER negatively and significantly responds to a bonanza of CAR outflows only in the long run. Taken together, the effects of episodes of large foreign capital inflows as well as outflows on most of the selected indicators are not very much persistent and statistically significant. These findings suggest that although Sri Lanka is a developing country, the authorities designed and implemented sound and effective economic and financial policies, which significantly helped mitigate the adverse effect of foreign capital flow bonanzas. However, the findings also reveal that there is a dire need to devise macroeconomic policies in such a way that they help in harvesting economic benefits of foreign capitals – in terms of credit expansion and higher economic growth.

**Table 4**

**The effects of FRR inflows (Panel A) and outflows (Panel B) on real and nominal sectors of Sri Lanka**

**Panel A: Inflows Effect**

K	CPI	NER	MMR	SP	GDP	DCG
1	0.022	-0.070	-0.058	0.472	0.025	0.030
2	0.036	-0.101*	-0.005	0.442	0.063	0.070*
3	0.012	-0.070	-0.011	0.439	0.020	0.092**
4	0.010	-0.060	-0.014	0.512	0.030	0.065*
5	0.064	-0.053	-0.015	0.441	0.014	0.047
6	0.062	-0.062	-0.007	0.289	0.047	0.019
7	0.057	-0.063	0.032	0.305	0.323***	-0.058
8	0.025	-0.039	0.017	0.006	0.287*	-0.044
9	0.011	-0.050	-0.016	0.076	0.278*	-0.028
10	-0.023	-0.097	-0.067	0.241	0.258	-0.011

**Panel B: Outflows Effect**

K	CPI	NER	MMR	SP	GDP	DCG
1	-0.036	0.021	-0.018	0.002	-0.009	0.014
2	-0.090	0.103*	-0.041	0.041	-0.003	0.013
3	0.099**	0.077	-0.016	-0.042	-0.028	-0.000
4	-0.085*	0.063	-0.034	-0.006	-0.000	-0.012
5	-0.067	0.038	-0.035	-0.056	-0.007	-0.000
6	-0.003	0.039	-0.037	-0.067	0.015	-0.014
7	-0.002	-0.009	0.026	-0.149*	0.197	0.011
8	0.041	0.022	0.040	-0.031	0.229	0.024
9	0.019	0.041	0.002	-0.122	0.209	-0.036
10	-0.007	-0.032	0.038	-0.216	0.195	-0.000

Note: GDP is stands for Gross domestic product per capita while DCG= Domestic credit growth, NER= Nominal exchange rate, CPI= Consumer price index, MMR= Market interest rate, and SP= Share prices. The \*\*\* indicates significance at 1 percent, \*\* at 5 percent, and \* at 10 percent level of significance, respectively.

The estimated IRFs for China are given in Tables 5 and B8. In the case of China, we also did not find any strong and significant impact of episodes of large FRR flows, both inwards and outwards, on both real and nominal sectors' variables. However, there are definitely some exceptions. For instance, we notice that only GDP significantly and positively responds to FRR inflow surges. Looking at the impact of episodes of large FRR outflows we find that MMR significantly and positively responds only in the long run. Conversely, GDP negatively

and significantly responds to episodes of large FRR outflows but also only in the short run. Turning to the effects of NFAR flows, we find that stock prices positively and significantly respond to large NFAR inflows in the short run. The response of GDP is also positive and significant at the 3<sup>rd</sup> to 5<sup>th</sup> period. We also find that the response of DCG is negative and statistically significant in the case of large NFAR outflow episodes in the short run. In contrast to our findings, a large number of studies have reported a positive impact of capital inflows on inflation, particularly with increasing capital account liberalization. Therefore, some scholars are of the view that the inflationary impact of capital inflows has become a concern for policymakers in China over time (Haiyue, 2013). Finally, we do not find any episode of large capital flow for CAR in the case of China. So we do not do any estimation with respect to this measure of foreign capital for China.

**Table 5**

**The effects of FRR inflows (Panel A) and outflows (Panel B) on real and nominal sectors of China**

**Panel A: Inflows Effect**

K	CPI	NER	MMR	SP	GDP	DCG
1	0.021	-0.032	-0.003	0.101	0.019	0.017
2	0.005	-0.049	-0.002	0.243	0.181**	0.073**
3	0.026	-0.043	-0.010	0.468	0.275***	0.008
4	0.073***	-0.035	-0.002	0.314	0.298***	0.009
5	0.058	-0.089	-0.006	0.027	0.343***	0.086**
6	0.037	-0.089	0.010	0.093	0.340***	0.058
7	0.018	-0.464	0.013	0.818	0.297	0.071
8	-0.005	-0.375	0.000	0.682	0.223	0.120***
9	-0.017	-0.310	0.001	0.691	-0.129	0.068
10	-0.034	-0.683	-0.027	0.900	-0.101	-0.020

**Panel B: Outflows Effect**

K	CPI	NER	MMR	SP	GDP	DCG
1	0.004	0.114	0.025	-0.251	-0.175*	0.067
2	-0.011	0.273*	0.022	-0.712	-0.208*	0.044
3	-0.022	0.211	0.002	-0.539	-0.176**	0.005
4	-0.017	0.220	0.027	-0.595	-0.181**	-0.014
5	0.011	0.220	0.048**	-0.913	-0.183	-0.035
6	-0.011	0.228	0.066***	-0.779	-0.190	-0.044
7	-0.018	0.173	0.065**	-0.560	-0.183	-0.003
8	-0.004	0.202	0.072*	-0.452	-0.243	0.014
9	-0.002	0.741	-0.027	-0.521	0.201	0.055
10	0.010	0.577	0.082**	-0.652	-0.253	0.059

Note: GDP is stands for Gross domestic product per capita while DCG= Domestic credit growth, NER= Nominal exchange rate, CPI= Consumer price index, MMR= Market interest rate, and SP= Share prices. The \*\*\* indicates significance at 1 percent, \*\* at 5 percent, and \* at 10 percent level of significance, respectively.

Based on the above-mentioned findings, several policy implications can be drawn, particularly for emerging and developing economies. First, it is observed that episodes of large capital inflows and outflows have a quite differential impact on macroeconomic indicators. For instance, our results suggest that large capital inflows are favorable for real economic activity measured by GDP per capita growth, whereas, large capital outflows



generally hamper GDP per capita growth. Moreover, capital inflow surges create inflationary pressures in the majority of the examined countries, whereas, large capital outflows lead to low inflation. In general, exchange rate appreciations are observed as a result of episodes of large foreign capital inflows. In contrast, we find that the exchange rate significantly depreciates in response to episodes of large capital outflows. Similarly, capital inflow surges are observed to improve banks' credit availability in the country, whereas, the quite opposite is observed during periods of large capital outflow episodes.

Second, the results of the paper suggest that the effects of foreign capitals are different depending on the measure of capital (net foreign assets vs. foreign reserves vs. capital account surplus). We observe that each measure of foreign capital flows has its own significance in determining real and nominal macroeconomic performance indicators. These findings imply that it is very important to take into consideration the type of capital flow while forming effective expenditure changing and expenditure switching policies. These findings also suggest that the authorities should take into account the effectiveness and ineffectuality of different measures of foreign capital while devising any strategy to sterilize and absorb foreign capital inflows. Such consideration will not only help to harvest the maximum economic benefits of foreign capitals such as higher availability of domestic credit, higher risk-sharing, higher economic growth, and higher financial sector development but also help mitigate adverse effects of foreign capital, for example, financial vulnerability, asset price bubbles, and higher exchange rate volatility.

Third, an important implication that can be drawn from the findings of this paper is that the response of real and nominal sector indicators is quite different within and across each measure of capital flows as well as across time horizons. Specifically, the findings suggest that the size and significance of the response of the variable depending on whether it is from the real sector or nominal sector. For instance, our findings reveal that the real sector is more responsive in the long run, whereas, the nominal sector, particularly, DCG, shows a significant response in the short run. Likewise, we note that although the effects of large capital flow episodes on some indicators are highly significant in the short run; they either become statistically insignificant or are totally reversed in the medium term and in the long run. In sum, the estimated IRFs indicate that both the size (economic effect) and statistical significance of the effect of large capital flow episodes considerably vary across projection periods for most of the selected countries. This is particularly true in the case of MMR, GDP, and DCG.

The last, but not the least, our findings suggest that the response of macroeconomic indicators to large capital inflow and outflow episodes is different in developing and emerging economies. The selected emerging economies (China and India) are relatively large and growing. Therefore, they have relatively more absorption capacity and higher shock resistance. Therefore, they have shown less responsiveness to episodes of large capital inflows as well as outflows. Said differently, these countries are less adversely affected by capital flow bonanzas. On the other hand, developing countries (Bangladesh, Pakistan, and Sri Lanka) are relatively small in size in terms of total economic activities and are more reliant on external resources. Therefore, both the real and nominal sectors of these countries have exhibited more sensitivity to large capital movements, both inwards and outwards. Among three of the selected developing countries, Pakistan's real and nominal sectors have shown more responsiveness towards capital flow surges. This finding makes sense and is in line with the stylized facts. Further, this finding suggests that the performance of Pakistan's economy significantly relies on foreign capital. The comparison of the effects of LCIF and LCOF for selected countries is given in Online Appendix.

## **4. Conclusions and Policy Implications**

The significance of large capital flow surges cannot be denied in determining the macroeconomic performance of developing and emerging economies. Theoretically, it is documented that foreign capital is a significant source of finance. Therefore, it boosts economic performance – in real as well as in nominal terms. However, the existing empirical studies present mixed evidence on the impact of large capital flow episodes on economic performance. Specifically, the prior literature has reported both favorable and unfavorable impacts of large capital flows on the host countries. Particularly, on the one hand, episodes of large capital inflows enhance economic performance by providing external capitals to finance investment-saving gaps. On the other hand, large capital inflow surges also fuel exchange rate volatility and create inflationary pressures. Further, they disrupt financial performance and lead to cause vulnerability in the whole economic system.

A review of the literature indicates that most of the existing studies have focused on either net capital inflows or episodes of large capital inflows. Yet, one can expect that foreign capitals affect the host countries very differently when coming in and flying out. Therefore, this paper has analyzed the differential impact of foreign capital inflows and outflows on macroeconomic indicators of selected South Asian countries (Bangladesh, India, Pakistan, and Sri Lanka) and China. In particular, this paper examines the responses of real and nominal sectors' variables to episodes of large capital inflows and outflows using annual data for the period 1970-2013 by estimating the IRFs-LP. Our findings have contributed to the existing literature on various grounds. For instance, we report that surges of large capital inflows and outflows have a differential impact on the macroeconomic indicators during the examined period. Episodes of large capital inflows trigger economic growth and increase credit availability in the recipient countries, whereas, they also create exchange rate pressures and inflationary spells. In addition to this, we also observe that the response of real and nominal sectors to episodes of large capital inflows and outflows is quite different – in terms of sign, size, and statistical significance.

Further, the results of this paper suggest that the impact of large capital inflow and outflow surges on macroeconomic indicators is different in developing and emerging economies. In the case of developing countries, both real and nominal sectors have shown significant response to large inward and outward flows of foreign capital, whereas, emerging economies' macroeconomic indicators have largely appeared insensitive to episodes of large capital inflows and outflows. These results have depicted clearly that surges in capital inflows and outflows are more likely to amplify risk for developing countries as compared to emerging economies. One possible explanation for such findings is that since emerging economies have more absorptive capacity and a more sophisticated risk-controlling mechanism, large capital movements may not have a very adverse influence on the real and nominal sectors in these countries. Another possible justification for such results is that both China and India are relatively large economies, have stable financial and economic markets, and experiencing high economic growth. Therefore, the macroeconomic indicators are less sensitive to large capital inflows and outflows in these countries. We can also say that foreign capitals largely flow to emerging economies due to 'pull' factors rather than 'push' factors. In contrast, in developing countries, foreign capitals generally accumulate due to either government foreign borrowings or owing to 'push' facts. Hence, capital inflows are expected to be more (less) detrimental to macroeconomic performance in developing (emerging and growing) economies.

The findings of the study have several useful policy propositions. Specifically, understanding the macroeconomic effects of large capital inflows is highly important. It would assist countries in adopting the appropriate policies by identifying the mechanism (either by pull or push factors) through which large capital flows escalate the financial vulnerabilities, for instance, inflationary pressures, abrupt exchange rate fluctuations, unnecessary and higher domestic credit growth, etc. Affected countries may have to ascertain some administrative controls to certain types of inflows and outflows that contribute more adversely in macroeconomic performance and cause financial distress. In the case of large capital inflows, Government reacts in a variety of manner: (i) nominal appreciation of domestic currency, (ii) acquiring foreign reserves and a consequent expansion in money supply for sterilization (iii) liberalization of international trade and international capital flows, (iv) switch government-controlled deposits from the commercial banks to the central bank, (v) introducing flexibility in exchange rate bands along with tightening of fiscal policy, (vi) mobilization of savings. The findings also suggest that massive capital flows have less positive but more negative effects when they are not utilized properly.

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