Preliminary Version

Managing Capital Flows and Remittances in the SAARC Region for Safeguarding Financial Stability*

This paper examines various aspects of capital flows and remittances in the context of SAARC countries. Reflecting the heterogeneity among SAARC economies, the study finds that the relative importance of capital flows and remittances varies from perspective of their balance of payments. Following the methodology suggested by Calvo (1998) and used by others, we identify phases of stops and surges for capital inflows, flights and retrenchments for outflows of varied average duration in SAARC countries. Interestingly, capital flows do not exhibit synchronized behavior in case of SAARC countries. Further, based on panel data analysis, we examine the role of various pull and push factors that influence capital inflows and outflows in SAARC countries and finds expectation of exchange rate of local currency and public debt as statistically significant factors for explaining both inflows and outflows. By contrast, GDP growth, political stability, trade openness and domestic interest rate do not seem to play any role in movements in capital inflows and outflows. As regards remittances, VECM estimates suggest that international crude oil prices and per capita income level in major non-gulf source countries play an important role while other factors (not included in the model) might also be at play. From financial stability perspective, the paper finds contrasting results on the relationship of capital flows with domestic macroeconomic indicators. It also estimates the level of intervention by SAARC central banks in domestic forex markets through Resistance Index and extent of sterilization of foreign capital flows. The paper concludes that capital flows differ both in terms of magnitude and duration and countries should strengthen their domestic fundamentals to make capital flows more resilient and less volatile.

Keywords: Capital Flows, FDI, Sudden Stops, Financial Stability, Panel Data
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Section I
Introduction

The rise in capital flows to emerging market economies (EMEs) in recent decades is a reflection of the rapid expansion and integration of international capital markets, largely driven

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by economic policy and structural changes, and also technological factors. Theoretically, the favourable impact of foreign capital flows can be realised through high domestic investment aiding the growth process in recipient economies. Further, the cross-border financial flows can channelize resources efficiently and offer risk diversification for global investors. However, the issue is that capital flows are rarely consistent with the precise needs of the individual economies and have often posed challenges for central banks not only from monetary policy perspective but also financial stability perspective *albeit* the nature of impact varies depending on external openness of economies.

Thus, the issue of capital flows has generated an intense debate among economists, highlighting its pros and cons. In case of SARRC countries, external flows occur not only through capital flows but also remittances. In fact, for smaller SAARC economies, latter is a dominant form of external flows due to presence of a sizable local diaspora abroad. Furthermore, the different policy frameworks (for monetary policy and exchange rate) as well as adoption of varied degree of capital account liberalisation, the policy challenges for policy makers are likely to vary. Against this background, it is interesting to examine the implications of external flows (capital flows and remittances) from the perspective of financial stability. The objective of the paper is three-fold: First, to identify/study various episodes of external flows and their impact on domestic variables. Second, to identify the major drivers for external flows to SAARC countries. And third, to examine other aspects of capital flows related to financial stability and identify policy actions that can make SAARC economies more resilient to volatile external flows.

Accordingly, the paper is divided into seven sections (including the introductory section). The second section will undertake a survey of literature on the issue of capital flows both in global and SAARC context. The third section provides some stylised facts on policy frameworks, importance of capital flows and remittances at each country level and implications for monetary policy. Basically, this section describes the evolution of capital flows to SAARC countries. The fourth section identifies the episodes of 'surges', 'stops', 'flight', and 'retrenchment' for capital flows in SAARC countries and implications for domestic variables (e.g., growth, inflation, monetary conditions, exchange rate, etc). The fifth section examines the role of 'push' and 'pull' factors for capital flows and remittances in SAARC countries using a panel data framework for selected SAARC countries. The sixth section examines the aspects of implications of external flows for financial stability. The last section concludes with policy recommendations relevant for SAARC countries.

Section II
Literature Review

Implications of capital flows and remittances: The global context

The issue of capital flows is by no means new in economic literature as it has posed macroeconomic and financial stability challenges for economies, particularly emerging market economies (EMEs) almost on an ongoing basis. Literature recognizes the role of both global "push" and domestic "pull" factors in determining the direction and magnitude of capital flows,

albeit their relative prominence may vary inter-temporally and across EMEs. From the perspective of balance of payments, not only the direction and magnitude of capital flows are important, the flow of remittances also plays a critical role in many small EMEs. This is particularly so for economies in the SAARC region which has a large diaspora abroad. This section provides an overview of extant literature focusing on determinants of capital flows and their macroeconomic and financial stability implications.

Following the crises of the 1980s and the 1990s, various empirical studies have focused on examining the macroeconomic challenges of increased capital flows to EMEs. The major risks and challenges that EMEs generally face consequent to the capital flows inter alia include currency appreciation pressures; asset price bubbles, excessive expansion of domestic bank credit, the expansion of domestic demand, widening of current account and the risk of overheating. These risks have the potential to induce financial and economic crisis (Reinhart and Reinhart, 2008; Cardarelli et al, 2010; Furceri et al 2012). Mihaljek (2008) highlights the importance of gross capital flows on at least three grounds, viz., (i) as a measure of financial integration between EMEs and advanced economies; (ii) as a source of information for macroeconomic analysis; and (iii), as a key source of information for financial stability analysis. Nevertheless, whether external flows benefit the recipient economy also depends on its ability to absorb foreign capital. This aspect has been emphasized inter alia by Prasad et al (2006) and Farkas (2015). Prasad *et al* does not find growth enhancing effect of foreign capital in non-industrial countries in the long-run due to lack of domestic absorptive capacity while by contrast growth and foreign financing are positively correlated in industrial countries. Farkas (2012) also supports that FDI and economic growth is shaped by absorptive capacities. While large capital inflows beyond absorptive capacity may pose challenge in the short run by making recipient countries vulnerable to external shocks, heightening the risks of economic overheating, there are risks of abrupt reversals in capital inflows with implications for domestic monetary management.

It is generally argued that the overall capital inflows matter more from macroeconomic management perspective, the composition of capital flows is critical for monetary policy, management of liquidity and financial stability. From monetary policy side, capital flows are important as certain types of capital flows are more sensitive to short-term interest rates (given exchange rate expectations), which, in turn, are highly linked to policy rates as part of the monetary policy transmission. Capital flows are important for the management of liquidity because the maturity or duration structure will influence the choice of instruments for sterilisation. The composition of capital flow is critical for financial stability as it determines how risks are shared between providers and recipients and also impacts domestic fixed capital formation. From financial stability perspective and policy formulation on capital account liberalization at country level, important dimensions of composition of capital flows include (i) equity versus debt, (ii) short-term versus long-term, (iii) investment versus consumption, (iv) foreign versus domestic currency and (v) tradables versus non-tradables. These dimensions of capital flows reflect the quality of capital inflows and critical for determining the vulnerability of a country to external shocks.

The past experience shows that inadequate attention to these aspects did lead to crisis in many EMEs in 1980s and 1990s. For instance, during the early 1990s, a large volume of

foreign private capital, mostly in short-term and foreign currency flowed in many EMEs (e.g., East Asian Economies). Even though it helped in financing current account deficits, the quality of capital flows eventually did pose financial stability concerns. Since these EMEs were exposed to the risks of currency and maturity mismatches, in the event of a loss of confidence, domestic issuers had to prematurely liquidate long-term assets to meet short-term repayment pressures. It triggered and aggravated the financial crises in 1990s of many EMEs (BIS, 2009).

Given the experience, EMEs in general, including SAARC countries, have moved cautiously towards capital account liberalization. In the pre-crisis period, both influential academicians (Obstfeld, 1998) and multilateral agencies (e.g., IMF, World Bank) often favoured policies for open capital account liberalization for EMEs, albeit their role in enhancing growth was ambiguous (Prasad, 2003, Eichengreen, 2004, IMF, 2005; Ocampo et al, 2008). It was argued that capital controls reduce the supply of capital and prevents country achieve their potential cost by raising the cost of financing; exacerbating financial constraints for local firms due to lack of direct access to global capital markets; making local firms less disciplined due to absence of markets (Harrison et al., 2004; Forbes, 2003). In the post-crisis period, however, there has been a great deal of re-thinking and debate on the appropriate policy responses to minimize the risks of capital flows to macroeconomic and financial stability at country-level. In practice, many EMEs used capital controls in the post-crisis period to minimize the spillover effects on their local currencies, and pursue independent monetary policies to curb asset bubbles and inflation. Further, a number of empirical studies also find the use of capital controls to be effective in achieving the primary objective of financial stability at country level (e.g., Baba and Kokenyne, 2011**;** Gallagher, 2011). Thus, even at multilateral level, capital controls are now being increasingly seen as legitimate tools to promote financial stability along with other policy options.

As one of the objectives of this paper is to assess the driving factors for capital flows and remittances to SAARC countries, it is important to briefly highlight as to what does the literature suggests on this issue in the global context. In fact, the debate on the role of 'push' and 'pull' factors as driving factors for global capital flows dates back to the 1990s when many EMs liberalised their capital accounts and received substantial short-term portfolio capital inflows and witnessed banking/financial crisis (Calvo, Leiderman, and Reinhart 1996). In the aftermath of global financial crisis, these issues again came to the forefront as large swings in global capital flows occurred and financial stability concerns were felt across economies through sudden stops, surges, retrenchments, and capital flight (Reinhart and Reinhart 2009; Cardarelli, Elekdag and Kose 2009; Forbes and Warnock 2011). The issue also assumed importance at international forums (IMF and G-20) which debated on whether there was a need for imposition of capital controls to deal with volatile capital flows. Highlighting the global spillovers of unconventional monetary policies in AEs, Rajan (2015) argues that "capital flows into recipient countries tend to increase local leverage; this is not just due to the direct effect of cross-border banking flows but also the indirect effect, as the appreciating exchange rate and rising asset prices, especially of real estate, make it seem that borrowers have more equity than they really have".

Theoretically, capital flows to any country during a period must reflect the confluence of supply side push factors and demand side pull factors. As regards the cross-border capital

flows in pre-crisis period, major pull factors that made EMEs as major recipient economies included successful price stabilisation programs, accompanied by improved fiscal policy fundamentals and greater macroeconomic stability, high growth in EMEs, more open capital account, *etc*. Similarly, among push factors, benign liquidity conditions in the global economy influenced by monetary/fiscal policies and declining profit opportunities due to lower growth in AEs also steered capital flows towards EMEs. While the push factors are largely beyond the control of recipient economies, EMEs have some leeway in exercising various policy options to alter the role of pull factors in capital flows as the domestic economic situation warrants. Nevertheless, the relative role of pull and push factors varied across countries and periods. In a similar vein, the remittance flows are also determined by pull and push factors. For instance, the major push factors include the income of the migrant, interest rate in source country and geopolitical conditions while the pull factors mainly include economic conditions in the recipient country (e.g. more remittances during the period of low income conditions), income is low); domestic interest rates and return on other alternative asset classes in recipient, domestic political uncertainty.

EMEs, with high growth potential, are expected to remain as preferred destination for capital flows. Consequently, capital flow to EMEs is likely to stay as a permanent feature of the global financial markets. However, we all know that the costs of benefits of capital flows have been a contentious issue among academics and policymakers. The systemic implications of capital flows for EMEs are well recognized and whether there is crisis or not, capital flows pose challenges for central bankers in EMEs during upswing as well downswing of the business cycle. While at the global level, smooth financial flows are generally perceived as sign of benign financial conditions, for individual EMEs, however, they may not always be welcome.

Capital Flows and Remittances in SAARC Countries: Literature Survey

In the context of SAARC countries, only a few country level studies exist which examine the issue of implications of external flows for financial stability or identify the pull or push factors for external flows. These studies have focused mainly on macroeconomic implications of external flows rather than much attention on financial stability implications. This sub-section presents a bird's eye view of these country-specific studies, though limited to major SAARC economies including India, Pakistan and Sri Lanka.

Since early 1990s, external sector developments in India have been marked by strong capital flows. Capital inflows, which hitherto were mainly confined to official concessional finance, picked up sharply with easing of FDI policy, permission of portfolio inflows and other regulatory changes. Thus, capital inflows increased not only in terms of size but also in terms of composition due to policies emphasizing a shift from predominantly official and private debt flows to non-debt-creating flows. Since the pick-up in capital flows to India, there have been a lot of studies that attempted to understand the precise nature of the causal relationship among capital flows, the exchange rate, interest rates and reactions of monetary policy. Most of these studies recognize that swings in capital flows make domestic macroeconomic and monetary management more complex. For instance, Kohli (2001) argues that consequent to foreign capital flows, domestic monetary expansion is difficult to monitor and if it remains unsterilized,

it could lead to financial stability implications through unscrupulous loans. Dua and Sen (2006) find capital flows to be the most important factor influencing the real effective exchange of the Indian rupee. Mohan (2007) argues that volatility in capital flows can have a significant impact on exchange rates, domestic monetary and liquidity conditions and overall macroeconomic and financial stability. Virmani (2007) also opines that if the medium-long term capital inflows are in excess of the long term current account deficit, it could lead various costs, in form of the rupee exchange rate. Kramer et al (2008) argues that even though India's is relatively less globalised as compared to her peer economies, global factors, e.g., capital flows, do significantly affect domestic monetary conditions. Mohan and Kapur (2009) finds that despite large capital flows to India since 1993-94, macroeconomic price and financial stability has been maintained in a high growth environment through effective policy measures. Kohli (2011) underscores the importance policy tools that have been used in case of India during various phases of capital flows to balance objective of both exchange rate and price stability. Gupta and Sengupta (2013) suggests that in an era of volatile capital flows, the policy makers need to achieve a balance among diverse objectives such as robust growth rate, sustainable current account deficit, competitive exchange rate, external capital for domestic capital formation, moderate inflation, targeted monetary and credit growth rate, minimizing financial fragilities and maintaining adequate reserves. Singh and Muzammil (2010) also recognizes implications of foreign capital inflows on Indian rupee exchange rate. Analysing the taper-talk period, Basu et al (2015) show that India, being the recipient of large capital flows in pre-taper talk period, was adversely impacted as large and liquid financial markets were a convenient target during period of global risk aversion and weakness in domestic macro-fundamentals also aggravated the external vulnerability. Identifying the episodes of surges and sudden stops in both the pre-crisis and post-crisis period, Gupta (2016) suggests that India's monetary policy has been influenced by the ebbs and flows of the capital inflows and shows that although price stability and growth have taken precedence over issues related to exchange rate or capital flows in policy rate setting, there is evidence of some accommodation in money supply during the surge and stop episodes.

In case of Pakistan, there are few studies that examine the impact of capital flows on exchange rate and other macroeconomic parameters such as growth and inflation. Most of these studies have focused on phases during which Pakistan experienced unprecedented rise in foreign exchange inflows especially through sharp rise in remittances which had implications for conduct of monetary policy, money supply, inflationary pressure and undue appreciation of Pakistan's rupee. Khan (1996) argues that among external flows, remittances, FDI and resident foreign currency deposits have been a durable source while portfolio investment, non-resident foreign currency deposits and other short-term capital are associated with a potential risk of a reversal of flows in a very short-term. Reversal in these flows can create a banking crisis and lead to higher volatility in both exchange rate and interest rate. Quayyum and Khan (2003) and Jan et al (2005) also recognize the monetary policy challenges emanating from interventions and sterilisation policy due to high capital flows in Pakistan. Rashid (2009) finds a significant causal relationship between foreign capital inflows and exchange rate volatility. Similarly, finding a positive and significant effect of capital inflows on monetary expansion and inflation, particularly during the periods of massive capital inflows from 2001 to 2007, Rashid and

Hussain (2010) emphasise the need to absorb the capital inflows in such a way they should neither create an inflationary pressure in the economy nor fuel the exchange rate volatility. Besides academic studies, monetary policy statements of the State Bank of Pakistan also do take cognizance of implications of capital inflows on monetary and reserve money growth in Pakistan. Ahmed (2009) finds that a sharp rise in FDI flows and remittance contributed to the persistent overvaluation of the local currency. Similarly, Rehman et al (2010) conclude that massive foreign direct investment inflows and workers 'remittances have upward impact on equilibrium real exchange rate of the Pakistan's rupee. By using the data from 1980-2010, Nazir et al (2012) find that external flows impact domestic inflation. In contrast to Yasmin (2005) and Raza et al (2012) finding growth enhancing effects of foreign capital flows in Pakistan, Ali (2014) argues that foreign capital inflows (including remittances) adversely impacts growth in the long-run.

Being a low saving economy, foreign capital inflows assumes importance to bolster domestic investment and hence the rate of growth. Among the few studies conducted for Sri Lanka, Pushparajah (2009) argues that capital flows were not too large to induce any destabilizing impact on the financial system stability and thus have not been a major challenge for conduct of monetary management except during 1993-1994 and 2007 when there were excessive capital flows. During these phases, the central bank responded mainly by sterilising the impact of the inflows on monetary aggregates by raising statutory reserve ratios and open market operations (Karunasena , 1996 and CBSL, 2007). However when external economic conditions led to a draining of liquidity from the domestic foreign exchange market, central bank supplied foreign exchange liquidity by intervening in forex market and reduced statutory liquidity requirements (CBSL, 2008). However, according to Hemachandra (2012), the restrictions on movements of foreign capital flows in Sri Lanka, particularly requirement of prior approvals for debt capital and other capital transactions and requirement to maintain foreign currency deposits subject to certain limits helped to minimise adverse impacts of tightening global liquidity.

In case of Bangladesh, studies have mainly focused in examining the impact of capital flows and remittances on growth, inflation and development (e.g., Chowdhury 2008, Roy, 2011, Kundu, 2012). However, Islam (2009) notes the implications of reserves build-up for monetary policy. Analysing the period of global financial crisis, Mujeri and Shahiduzzaman (2009) suggest that the financial sector was largely insulated as the spillovers through capital flows (both portfolio and foreign direct investments) were minimal and remittances and higher external aid flows provided a cushion to the external balance. As far as Nepal is concerned, it was only in 1992 that FDI was allowed and repatriation to the foreign investor was permitted. Aryal (2009) recognizes that capital flows lead to an increase in net foreign assets (NFA) which being a part of monetary base has implications for money supply. Pant (2007) also cautioned that policy makers in Nepal must purse liberalization of outflows and inflows in a balanced manner so that the pressure on exchange rate and money supply could be minimized. Panday (2012) views that remittances are vital for short-run macroeconomic stability, subsequently supported by Budha (2015) finding that movements in NFA are largely due to the volatile large remittance inflows, rather than capital flows. Commenting on recent rise in remittances, the IMF in its Article IV Report on Nepal (2014) states that remittances have led to improvements

in living standards, but may be weakening external competitiveness. Other studies have largely covered the issue of role of remittance in economic development of Nepal (e.g., Srivastava and Pant 2006, Chaudhary, 2007, Shrestha 2008, Sharma and Gurung 2009, Thagunna and Acharya 2013).

Section III

Capital flows and remittances in SAARC countries: Stylised facts

Before analyzing the issue of capital flows and remittances in the context of SAARC countries, it is important to have a broad idea on the extent of external openness in these economies. Broadly speaking, major SAARC countries are now more liberalized and globalized than two and half decades ago. Major SAARC economies have freed domestic markets and institutions from controls, allowed foreign entry into the domestic markets for financial assets; and loosened government regulation of the financial markets. Earlier these were characterized by severe financial repression and financial markets had little freedom as interest rates and exchange rates were administered and also neither the current nor the capital account of the balance of payment was convertible (Goyal, 2012).

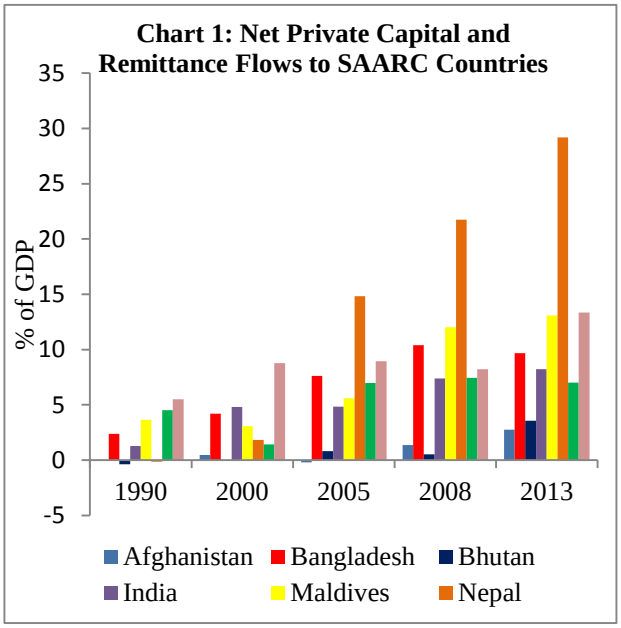
External openness, even though differs in terms of pace, extent, timing and sequencing across major SAARC economies, they all have been prone to external developments as they are much more open than in earlier decades. India, Pakistan and Bangladesh moved to full current account convertibility almost around the same time during 1990s. As regards capital account liberalization, India has adopted a gradual approach and similarly while currency convertibility remained partial on the capital account for both Bangladesh and Pakistan, the former retained more controls compared to latter. Bangladesh economy is virtually fully open to non-resident for capital inflows and outflows in the equity and longer term debt markets, but barred from investing in local short term money markets to avoid risks of volatility and destabilization from surges of money inflows and outflows. Notwithstanding a gradual approach towards capital account liberalization in major SAARC economies, they are still considered as highly regulated economies by multilateral agencies. Based on IMF (2014), Table 1 provides a synoptic view of exchange arrangements and regulatory frameworks for current and capital transactions for SAARC countries.

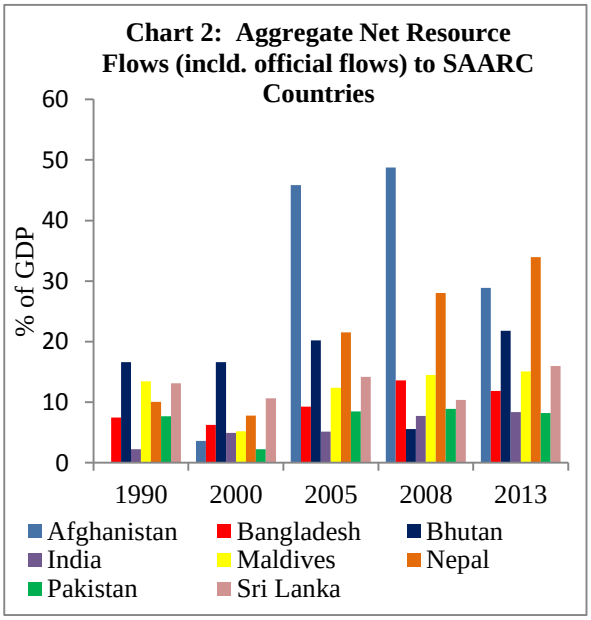
Table 1: Policy Frameworks in SAARC Countries				
Country	Exchange Rate Arrangement		Monetary Policy Framework	Controls on capital and money market transactions
	De jure	De Facto		
Afghanistan	Managed Floating	Floating	Reserve money target as nominal anchor	Yes, currently no capital market securities transactions are allowed.
Bangladesh	Floating	Reclassified from other managed to a stabilized arrangement w.e.f February 2013	Monetary aggregate	Yes, not fully convertible
Bhutan	Conventional peg vis-à vis Indian rupee	Conventional peg vis-à vis Indian rupee	Exchange rate anchor vis-à-vis the Indian rupee	Yes, all capital transactions must be approved by the Bhutanese Government and RMA. No capital investment other than FDI is allowed.
India	Floating	Floating	Multiple Indicator Approach (1998 to February 2015)*	Yes, not fully convertible
Maldives	Pegged exchange rate within horizontal bands (linked to dollar).	Pegged exchange rate within horizontal bands (linked to dollar).	Exchange rate anchor vis-à-vis the US dollar	Yes, not fully convertible
Nepal	Conventional peg vis-à vis Indian rupee	Conventional peg vis-à vis Indian rupee	Exchange rate anchor vis-à-vis the Indian rupee	Yes, not fully convertible
Pakistan	Floating	Other managed arrangement, effective December 5, 2013	Multiple indicator approach. In practice, inflation (forecast) implicitly serves as a nominal anchor but assessment of monetary aggregates still serves as a useful gauge of inflation pressure.	Yes, not fully convertible
Sri Lanka	Free floating	Reclassified to a stabilized from a floating arrangement W.E.F. Oct. 1, 2013	Monetary-targeting framework	Yes, not fully convertible
* With agreement on Monetary Policy Framework in February 2015, flexible Inflation targeting was adopted.				
Source: Annual Report on Exchange Arra ngements and Exchange Restrictions 2014, IMF.				
Reserve Bank of India.				

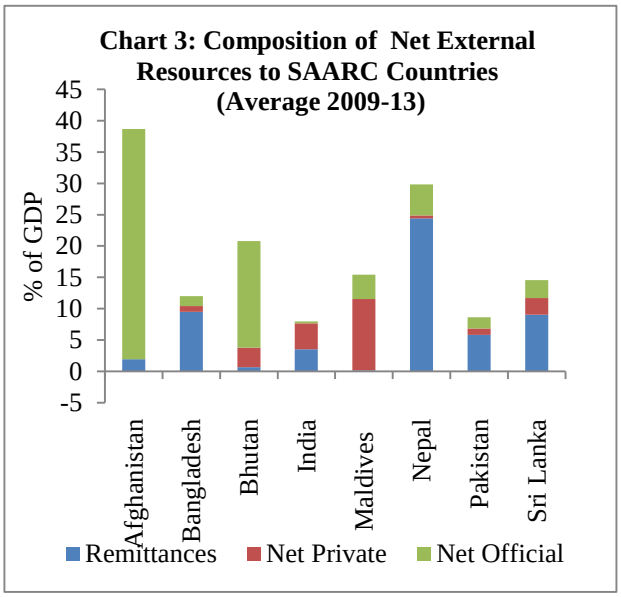
Since most of the SAARC economies have deficit on trade as well as current account, remittances and external capital flows play an important role from the perspective of external vulnerability. However, extent of dependence on foreign capital flows varies across economies. Traditionally workers' remittances and official flows have been the main source of inflows for these economies, however with gradual opening-up of economies, capital inflows also appeared in the forms of foreign currency deposits, and portfolio and direct investment in major SAARC economies. For instance, reflecting the immigration of Pakistan labour to the Middle East region during the oil price boom of the 1970s, remittances were a major source of external flows but with subsequent relaxation of capital controls and the opening-up of financial sector, external capital also flowed in the forms of private capital including foreign currency deposits, and portfolio and direct investment. Similarly, the relative role of official flows has dwindled in case of India and Sri Lanka.

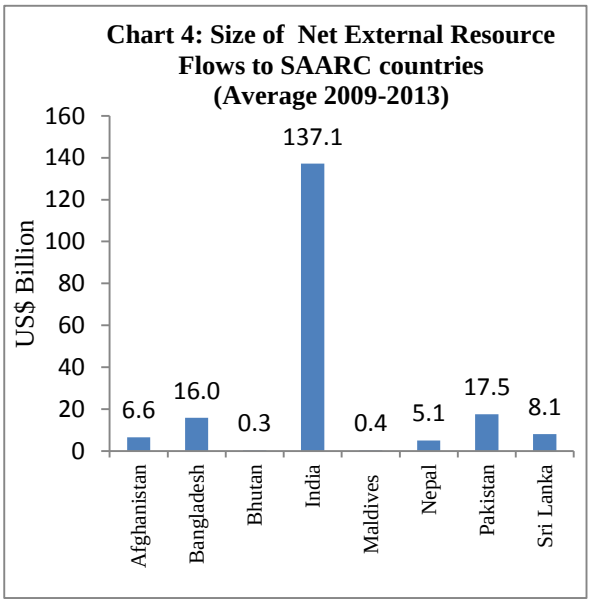
The size of flows through both foreign capital and remittances has increased in all SAARC countries, though the latter has grown faster than the former. Further, flows in form of remittances have been more steady and durable than private capital flows which are often influenced by diverse factors relating to global and domestic economy. Among SAARC

countries, the net private capital flows and remittances as a ratio to GDP is highest for Nepal and lowest for Afghanistan (Chart 1). However, taking into account all sources of external flows (i.e., net private capital flows, official flows and remittances) as ratio to GDP, Afghanistan is the top recipient, followed by Nepal, Bhutan and Maldives while the ratio for Bangladesh, India, Pakistan and Sri Lanka is in the range of 8 to 14 per cent (average 2009-13) (Chart 2). It implies that in case of smaller SAARC economies, instead of private capital flows, remittances and official flows account for a major portion of total external flows (Chart 3). Nevertheless, in terms of absolute magnitude, India, Pakistan and Bangladesh figure among the top recipients of external resources through capital flows and remittances (Chart 4).



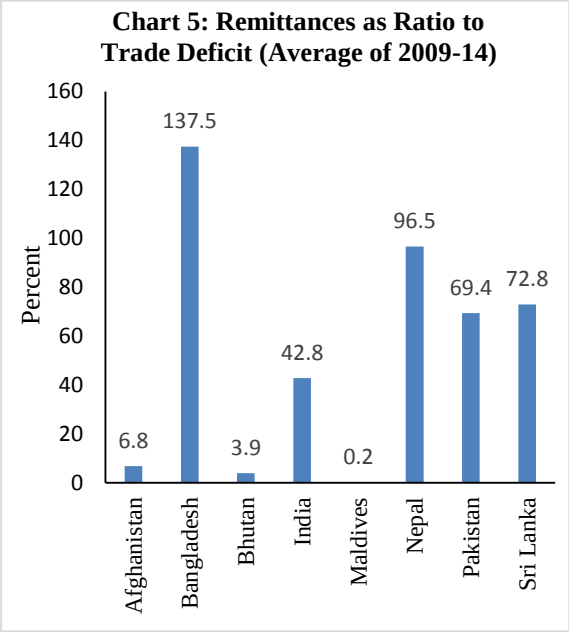


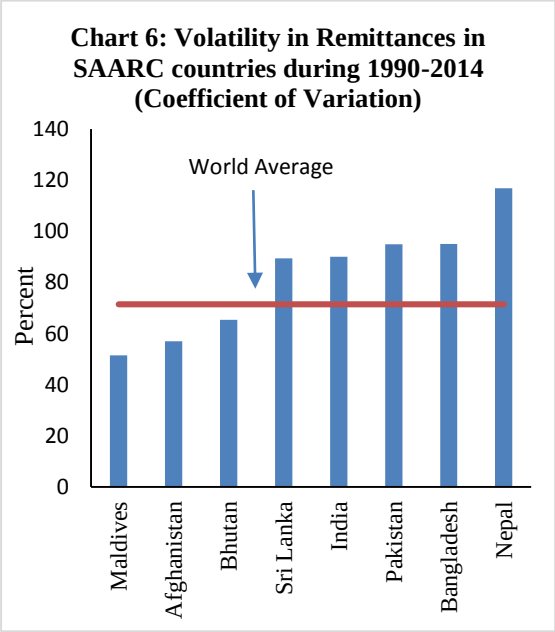




Source: IMF and ADB

As far as the role of remittances and capital flows from the perspective of balance of payments is concerned, it varies a lot across countries. As Chart 5 shows, flows through remittances to Bangladesh are more than sufficient to finance merchandise trade deficit. In case of Nepal, Pakistan, Sri Lanka, remittances can finance a significant part of merchandise trade deficit. In contrast, the role of remittances in financing merchandise trade deficit is modest in case of India and negligible in case of Afghanistan, Bhutan and Maldives. Similarly, volatility of remittances (measured by coefficient of variation) is much smaller in low recipient countries than bigger recipients which is above the world average (Chart 6).





Source: IFS, IMF and Remittances Database, World Bank

Likewise capital flows in major SAARC countries have remained volatile during the period of study. Though these aspects are being examined in detail in the following sections, the volatility in capital flows is evident from net accretion or depletions in official foreign exchange reserves implying that net capital inflows exceeded current account deficit (CAD) in some years and were insufficient to finance it in other years. In this context, not only a country's absorption capacity, which is also determined by the depth of the financial system, is critical for mitigating the external shocks but is also important for enhancing growth effects of foreign capital.[1] Thus, unlike advanced economies, the lack of a developed financial markets limits the policy room for central banks in sterilizing the effects of the excessive inflows which, in turn, can raises the risk for Dutch Disease effects whereby the unsterilized inflows can lead to currency appreciation and undermine external competitiveness. This could be true for most of the SAARC economies. As measured by the coefficient of variation, the results in Table 2 show that capital inflows to Afghanistan are more volatile, followed by Sri Lanka, Nepal, Pakistan, Bangladesh, India, Bhutan and Maldives.

[1] In general, the absorptive capacity generally implies the existence of various local conditions conducive for economic growth.

Table 2: Flows Statistics. Quarterly Data 2002Q1 - 2014Q4

Countries	Mean			Maximum			Minimum			Coefficient of Variation		
	Inflows	Outflows	Remit	Inflows	Outflows	Remit	Inflows	Outflows	Remit	Inflows	Outflows	Remit
Afg	25.2	36.0	27.1	357.9	173.2	68.3	-279.4	-107.9	2.76	520.35	201.93	60.2
Bhu	50.07	0.6	36.3	103.2	3.9	64.5	8.65	-1.7	21.3	65.75	194.80	36.1
Bang	596.9	160.3	2301.4	2644.9	1495.2	4127.0	-271.5	-438.0	764.4	106.56	172.11	48.3
India	15932.7	3814.0	11168.5	35961.4	16316.0	17992.3	-1565.9	-5223.1	3889.9	68.32	120.97	44.2
Mal	67.0	16.9	45.3	122.7	41.4	87.8	16.7	-8.1	12.6	48.02	103.58	55.9
Nepal	65.6	87.1	816.7	391.1	240.5	1717.5	-271.2	-16.8	189.2	157.00	67.98	60.5
Pak	980.3	84.6	3174.5	4627.0	887.0	5745.0	-924.0	-465.0	1405.0	121.79	357.24	38.3
SL	240.1	9.6	883.0	2131.0	390.0	1932.4	-987.6	-284.4	299.7	293.65	1702.73	55.9

Sample period for AF and Bhutan are 2008Q2 - 2014 and 2006Q1 - 2014Q4 respectively.

Section IV
Episodes of Surges, Sudden Stops, Flights and Retrenchments for Capital Flows in SAARC countries

This section attempts to identify various phases of capital flow movements in SAARC countries and classifies them into surges, stops, flights and retrenchment based on the methodology originally suggested by Calvo (1998) and later modified and used by others including Forbes and Warnock (2012). The concept of 'Stops' was originally used in the context of net capital inflows, though with greater emphasis on changes in gross capital inflows and outflows subsequently, various studies further extended the analysis to identify phases of 'Surges' (sharp increases in gross inflows), 'Stops' (i.e., sharp declines in gross inflows), 'Flight' (sharp increase in gross outflows) and 'Retrenchment' (i.e., sharp decreases in gross outflows). Since this approach explains the changes in net capital flows by capturing the behaviour of foreign and domestic investors separately, it is more relevant for countries which are both recipient as well as source of capital flows from/for rest of the world. Even though smaller SAARC countries are largely recipient of foreign capital flows, the concept of gross inflows and gross outflows may be more relevant for identifying various phases for countries like India and Pakistan.

According to the criteria suggested in literature (See Annex 1 on Methodology to Measures Capital Flows Episodes), we construct episodes of gross inflows, gross outflows and net inflows for SAARC countries (Annex 2.1, 2.2 and 3). As shown in Table 3, we identify 128 episodes of flows for all SAARC countries. In total SAARC economies have witnessed 25 episodes of stops and 23 episodes of surges in gross inflows and the average duration was 5.3 and 4.8 quarters respectively. Similarly, the average time for stops and surges of net inflows is computed as 4.8 and 5.2 quarters, respectively.

Table 3: Summary Statistics for Episodes (2004 – 2014)

	Inflows				Outflows				Net Inflows			
	Stops	**Duration**	**Surges**	**Duration**	**Flight**	**Duration**	**Retrench**	**Duration**	**Stops**	**Duration**	**Surges**	**Duration**
Overall	25	5.3	23	4.8	27	5.1	24	3.7	24	4.8	25	5.2
Afghanistan	2	3.5	3	3.0	2	5.5	2	4.0	2	3.5	2	3.5
Bangladesh	3	3.3	4	2.3	4	3.8	3	1.3	3	3.0	4	2.8
Bhutan	2	9.0	2	8.5	3	4.3	3	5.7	2	8.0	2	8.8
India	4	4.0	3	4.3	3	4.7	5	3.2	7	2.0	3	4.3
Maldives	2	11.0	4	3.3	3	9.0	2	6.5	2	11.0	3	4.0
Nepal	5	3.0	3	4.3	5	5.4	1	4.0	2	4.0	6	3.0
Pakistan	2	7.5	2	8.0	4	2.8	2	1.5	3	4.7	2	9.0
Sri Lanka	5	1.4	2	4.5	3	5.0	6	3.0	3	2.3	3	6.0

Note: Average duration is defined in terms of number of quarters.

As far as gross outflows are concerned, we identify 27 of flights and 24 episodes of retrenchment with average length of 5.05 and 3.65 quarters, respectively. The size and frequency of various phases does reflect the volatility in capital flows in the region. It appears some SAARC economies (Pakistan, Bhutan and Maldives) face relatively more prolonged phases of 'stops' and 'surges' than others.

The difference in frequency and duration of various phases of capital inflows and outflows also gets confirmed from the finding that cyclical components of gross as well as net capital inflows do not show co-movement with each other implying that cyclical behavior of capital flows varies across SAARC countries. It means capital flows in SAARC countries are largely affected by different dynamics rather than common shocks (Table 4 and Annex 4).[2] Further, unlike the results in Forbes and Warnock (2012), we conclude two important lessons in the context of SAARC countries. First, stop and surge episodes based on gross inflows and net inflows report almost similar results at country level despite the fact that the former incorporates behavior of foreign investors while the latter also includes changes in capital flows by domestic investors; second, as corollary from the first, the role of both domestic and foreign investors may reflect the significant impact of pull and push factors.

Table 4: Correlation Matrix of Cyclical Components of Gross Capital Inflows (1995:Q1 to 2014:Q4)

	LBDCY	LINDCY	LNPCY	LPKCY	LSLCY
LBDCY	1.00				
LINDCY	-0.01	1.00			
LNPCY	-0.14	-0.09	1.00		
LPKCY	0.05	0.03	0.00	1.00	
LSLCY	0.00	0.02	0.22*	0.05	1.00

*: A correlation coefficient of 0.185 or more is statistically significant at 5 per cent.
Note: LBD, LIND, LNP, LPK, LSL represent Bangladesh, India, Nepal, Pakistan and Sri Lanka for which comparable quarterly data are available in IMF's BOPS.

Section V
Capital Flows: The Impact of Pull and Push Factors

As a result of intense fluctuations in capital flows as evident from extreme episodes, an attempt is made in this section to empirically investigate whether domestic (pull), foreign (push) or both factors play role in determination of capital flows to SAARC countries. In order to meet this objective, we use a large but not exhaustive list of explanatory variables available in Ying and Kim (2001), Culha (2006) and Arias et al (2013). We analyse the impact of these pull and push factors on gross capital inflows as percentage of GDP (GIGDP), gross capital outflows as percentage of GDP (GOGDP) and net capital inflows as percentage of GDP (NIGDP) in the context of SAARC countries.

[2] To derive the cyclical component of gross capital inflows, gross capital outflows and net capital inflows, the Hodrick-Prescott filter is used. Correlation matrix for gross capital outflows and net capital flows are provided as Annex 4.

The strategy is of constructing estimable equation for each type of capital flows with selection of explanatory factors[3] in order of significant (see Annex 5 on methodology of Panel Estimation). Using the Leamer (1985) sensitivity test, we have selected lag of the dependent variable, appreciation expectations (NER), public debt as percentage of GDP (PDEBT), reserves adequacy (RESAD), international stock price (FSP) and last but not the least is international oil price (OP) as significant from the list of nine internal and four external variables given in Annex 5 of this paper[4]. We also use redundant variable test for inclusion of the relevant variables.

Tables 5, 6 and 7 report results of the estimated panel models using annual data, from 2002 to 2014, across different specifications. First column shows results from pooled Ordinary Least Square (OLS), followed by Random Effects (RE) model and then Fixed Effects (FE) for GIGDP, NIGDP and GOGDP. As shown in these Tables, all forms of capital flows show high degree of inertia particularly capital outflows with significant coefficient of 0.63.

Table 5: Effects of Pull and Push Factors on Gross Capital Inflows. Results Across Different Specifications. Annual Data 2002 – 2014. Dependent Variable: Gross Capital Inflows as Percentage of GDP (GIGDP)

Variables	Pooled OLS	RE Model	FE Model
GIGDP(-1)	0.44*** (0.000)	0.48*** (0.000)	0.47** (0.003)
NER	-0.08*** (0.000)	-0.05*** (0.001)	"-0.12** (0.003)
PDEBT	0.09*** (0.000)	0.06*** (0.001)	0.05 (0.37)
RESAD	-0.07* (0.06)		-0.08** (0.06)
FSP	0.05* (0.04)	0.04** (0.04)	0.05*** (0.000)
OP	0.08*** (0.000)	0.06*** (0.001)	0.08*** (0.000)
C	6.64 (0.17)	-0.79 (0.56)	2.45 (0.40)
R-squared	0.72	0.72	0.73
BP-LM Test	2.66		
Hausman Test		0.00	
Redundant FE test			0.44
Observations	72	72	72
No of Countries	6	6	6

Note: P-value in bracket. *Sig at 10%, **sig at 5% and ***sig at 1%

[3] Leamer (1985) sensitivity test is applied for variable selection. In this analysis model with different variables are tested and records changes in the sign and significance level of coefficient of the concerned variable

[4] Definitions of independent variables are available in Arias et al (2013).

Table 6: Effects of Pull and Push Factors on Gross Capital Outflows. Results Across Different Specifications. Annual Data 2002 – 2014. Dependent Variable: Gross Capital Outflows as Percentage of GDP (GOGDP)

Variables	Pooled OLS	RE Model	FE Model
GIGDP(-1)	0.63*** (0.000)	0.67*** (0.000)	0.44 (0.000)
NER	0.02 (0.63)	-0.001 (0.81)	0.007 (0.62)
PDEBT	-0.009 (0.19)		0.05 (0.37)
RESAD	-0.008 (0.38)	-0.001 (0.81)	-0.02 (0.27)
FSP	-0.007 (0.26)	0.005 (0.26)	-0.005 (0.35)
OP	-0.002 (0.56)	-0.0006 (0.87)	-0.005 (0.42)
C	0.55 (0.22)	0.46 (0.26)	0.86 (0.31)
R-squared	0.65	0.64	0.71
BP-LM Test	0.006		
Hausman Test		0.05	
Redundant FE test			2.64**
Observations	72	72	72
No of Countries	6	6	6

Note: P-value in bracket. *Sig at 10%, **sig at 5% and ***sig at 1%

Table 7: Effects of Pull and Push Factors on Net Capital Inflows. Results Across Different Specifications. Annual Data 2002 – 2014. Dependent Variable: Net Capital Inflows as Percentage of GDP (NIGDP)

Variables	Pooled OLS	RE Model	FE Model
GIGDP(-1)	0.51*** (0.000)	0.55*** (0.000)	0.51** (0.003)
NER	-0.08*** (0.001)	-0.06*** (0.003)	"-0.13** (0.000)
PDEBT	0.09*** (0.000)	0.06*** (0.001)	0.04 (0.37)
RESAD	-0.05* (0.09)		-0.08* (0.06)
FSP	0.05* (0.02)	0.04** (0.04)	0.06*** (0.001)
OP	0.07*** (0.000)	0.065*** (0.003)	0.08*** (0.001)
C	-1.02 (0.49)	-1.50 (0.31)	2.78 (0.38)
R-squared	0.74	0.73	0.73
BP-LM Test	2.61		
Hausman Test		0.00	
Redundant FE test			0.94
Observations	72	72	72
No of Countries	6	6	6

Note: P-value in bracket. *Sig at 10%, **sig at 5% and ***sig at 1%

As far as pull factors are concerned, GDP growth, political stability, trade openness, terms of trade, real exchange rate and domestic interest rate play no role in each of the three cases. However, expectation of exchange rate appreciation (NER impacts both gross and net capital inflows positively but does not impact outflows. The reason behind this may be confidence, strength of economic fundamentals and high return when reverting back to the foreign currency. Further, with expected appreciation of local currency, the cost of foreign borrowing for domestic entities might be becoming lower and thus inducing more capital inflows to the economy. We also conclude an interesting and unlikely result of Public Debt (PDEBT). PDEBT has positive impact on capital inflows which may reflect the expected trust from investors following the approval of loans from international financial institutions. In the case of pull factors, reserves adequacy (RESAD) as percentage of GDP has negative effect on capital inflows, belying our a priori expectation. However, the same results are concluded in Fratzscher (2011) with explanation that countries of high reserve holdings with poorer quality institutions suffer from larger capital outflows during crisis[5] which seems to be valid for SAARC countries where domestic institutions are still grappling with weaker institutions.

Regarding push variables, advanced economies' GDP growth (AEGDPg) and foreign interest rate (Libor) have insignificant impact on capital flows to and from SAARC countries. However, foreign stock price (FSP) variable has positive effect and is in line with Arias et al (2003) wherein co-integration and co-movements of financial markets is provided as possible explanation. It suggests that even though SAARC economies are considered to be less developed and not much integrated with foreign markets, capital flows are influenced by trend in foreign markets. The last but not the least, our results show that international oil prices have positive and significant impact on gross and net capital inflows across all specifications, whereas, as expected, it has negative effects on gross capital outflows. Even though high oil prices do not augur well for SAARC economies due to their high dependence on oil imports, but these economies might be getting more capital flows as funds from oil exporting countries are generally recycled to other EMEs as was the case during periods of oil shocks. Importantly, some of SAARC economies are highly linked to oil producing gulf countries.

Similarly, remittances in the SAARC region are found to be pro-cyclical with respect to income in the migrant's host country and trend in international oil prices. As data on total remittances to SAARC region (REM), international crude oil prices (OP) and per capita income level in major non-gulf host countries (AEPCY) for period 1975-2015 confirm the presence of cointegration among variables[6], we use vector error correction (VEC) method to estimate the cointegrating equation. VECM estimates suggest that one per cent increase in international oil prices leads to about 0.7 per cent increase in remittances in the region[7] while the same level of increase in per capita income in major non-gulf host countries increases remittance flows more than proportionately (Table 8). The error correction term (ECT) is also statistically significant describing the short-run dynamics or adjustments of the REM towards its equilibrium values.

[5] The data show that Nepal and Bhutan have high reserve holdings as percentage of GDP.
[6] The Augmented Dicky-Fuller test for unit root confirms all series to be I(1).
[7] Broadly in line with other country-specific studies (e.g., Islam and Nasrin 2015, Naufal and Tremos 2009)

Importantly, these results need to be interpreted taking cognizance of the fact that in practice, apart from these push variables, there could be other country-specific factors that might be influencing remittances. However, due to dearth of comparable long-time series data, their inclusion in the VECM estimation was not possible.

Table 8: Vector Error Correction Model Estimates for Remittances in SAARC Region

Variable	ECT	Cointegrating Equation			R^2
		C	LN(OP)	LN(AEPCY)	
Coeff. (t-stat)	-0.24* (-2.68)	1.45	0.69* (6.11)	1.61* (9.6)	0.30

Note: Two dummies for year 1986 and 2015 were also used as control variable.
*Statistically significant

Section VI
Flows and Financial Stability

As evident from data and extreme episodes of capital flows, volatility, not the magnitude specifically in terms of GDP, may hamper macroeconomic and financial stability through excessive oscillations in exchange rate and domestic credit in small economies like SAARC countries. This section analyses the problem of financial stability beginning with brief overview.

Financial Integration

An integrated financial market is one in which potential market participants face a single set of rules, have equal access and are treated equally (Garcia-Herrero and Wooldridge (2007). The authors' approach to measuring financial integration is based on regulatory measures, price-based measures and quantity based measures. Following this study, we compute level of financial integration for SAARC countries based on available data in the International Financial Statistics as provided by the IMF.

Using the Feldstein and Horioka (1980) test of relation between domestic investment and saving, we regress gross fixed capital formation to GDP ratio over savings to GDP ratio for our sample countries. According to this test, strong relation means low level of integration and vice versa. The average coefficient for SAARC countries is 0.64 indicating a low degree of financial integration as compared to 0.25 of Asian emerging economies concluded in (Garcia-Herrero and Wooldridge (2007)[8]. Another measure of financial integration is the sum of foreign assets and liabilities as percentage of GDP. As compared to other emerging and advanced economies, the overall average value of 72 percent for SAARC countries also shows a low level of financial integration with rest of the world.

[8] The coefficient for Bangladesh, Bhutan, India, Nepal, Pakistan and Sri Lanka are 0.84, 0.54, 0.77, 0.32, 0.60 and 0.79 respectively.

Net Capital inflows, current account and international reserves

Besides financial integration, the use of net capital inflows depends over its two counterparts (reserves and current account) in the balance of payments. Net capital flows are either used for financing current account deficit or reserves accumulation. The data, over the sample period from 2002 to 2014, show that most of the SAARC countries suffer from current account deficits. Therefore, capital inflows in these countries are mostly used in financing current account deficit.

Capital Inflows and Macroeconomic Indicators

In addition to the background information, we should also take into account relation between macroeconomic indicators and capital inflows[9]. Table 9 shows correlations between capital inflows and macroeconomic variables – large scale manufacturing (LSM), credit, inflation, nominal exchange Rate (NER), current account, reserves, lending rate (LR), money supply (Ms) and stock price index (SP). As reported in the table, the results show a mixed behaviour in the SAARC countries. In the case of LSM, it happens to have insignificant correlation with inflows in all the countries except Sri Lanka. Similarly, we conclude no statistical relation of capital inflows with inflation but Pakistan, where, instead of going upward, negative relation may be a coincident or cause of other variable(s). Likewise, credit and inflows have weak relation with the exception of Bangladesh and Sri Lanka where credit and inflows move in the same direction.

Table 9: Gross Inflows: Correlations with macroeconomic indicators

Countries	LSM	Credit	Inflation	NER	RER	Current A/C	Reserves	LR	Ms	SP
Afghanistan	…	-0.05	0.06	0.55	…	-0.03	0.04	-0.18	-0.38	
Bangladesh	-0.18	0.35*	-0.12	0.46*	…	0.08	0.26*	-0.01	0.1	0.35*
Bhutan	-0.22	0.27	-0.22	-0.009	…	-0.72*	0.83*	0.31	-0.38	
India	0.12	-0.13	0.01	-0.60*	0.73*	-0.2*	0.28*	-0.14	0.20*	0.57*
Maldives	0.05	0.38	0.06	-0.4	…	-0.32	0.63*	0.11	0.08	0.21
Nepal	…	-0.14	-0.12	0.03	…	0.28*	-0.13	0.01	-0.09	…
Pakistan	0.06	0.05	-0.32*	-0.27*	0.24*	-0.002	0.09	0.16	0.27*	0.41*
Sri Lanka	-0.25*	0.29*	-0.009	0.17	-0.2	-0.08	-0.04	0.19	0.18	0.03

*Significant

In the case of NER and RER, both variables are happened to appreciate in case of India and Pakistan and the former is depreciated in case of Bangladesh. As far as current account and reserves are concerned, in most of the countries, we conclude the expected results. Further, domestic lending rates seem to be insignificantly related to capital inflows. Finally, the results show positive co-movements between stock price and capital inflows as was a priori expected.

[9] Capital outflows are negligible so we only focus on capital inflows.

Capital Flows and Financial Stability

In light of the preceding discussion, this section is devoted to highlight implications for financial stability associated with capital flows and remittances in the SAARC countries. As shown in the above graphs, capital flows to these economies are mainly concentrated to remittances and official loans[10]. Although remittances are considered to be more permanent and less prone to reversals, however, our panel results indicate highly significant impact of oil price (OP) on remittances inflows. It means that decrease in international oil price may lead to negative effect specifically on remittances[11] as evident from the recent experience of drastic slump in global oil prices[12]. In fact, in recent phase of falling oil prices, India and Sri Lanka have seen lower remittances. Since remittances play a modest to significant role in financing merchandise trade deficit in major SAARC economies, policy efforts, particularly towards reduction in cost of remittances, are required to boost flows.

In addition to high dependence on remittances, SAARC countries have also low degree of financial integration with rest of the world, as evident both from measures of financial integration and insignificant impact of foreign interest rate and growth in advanced economies. It implies that flows be diversified through gradual opening up of these economies and focusing on shifting the composition of inflows towards FDI instead of dependence on vulnerable and costlier external debt. The reason is that FDI is mainly driven by changes in economic fundamentals rather than by arbitrage and speculative factors.

The results in Table 9 also report that capital inflows may induce exchange rate appreciation in India and Pakistan damaging competitiveness of exports sectors and economic growth. This may lead to real appreciation and so increase in current account deficit which pave the way for inflows reversals or sudden stops. In the case of Bangladesh, inflows have unexpected impact of nominal exchange rate depreciation. This may be reflecting excessively loose monetary conditions and accumulation of foreign exchange reserves[13] as mentioned in Cardarelli et al (2009). To characterize exchange rate policy, we compute Resistance Index (RI) for SAARC countries. RI is defined as change in percentage reserves scaled by its standard deviation and divided by Exchange Market Pressure (EMP)[14]. This ratio of change in foreign exchange reserves and EMP index measures the proportion of exchange market pressure that is resisted through intervention. When the index is equal to 0 or negative, it means no resistance and exchange rate is allowed to the market forces. On the other hand, when the value is equal to or more than unity, it means maximum resistance is attempted.

The RI results covering sample period from 2002q1 to 2014q4 are divided into three periods based on global financial crisis 2007-08: (a) pre-crisis period, (b) crisis period and (c) post-crisis period. Generalizing the results for all SAARC countries, we conclude minimum resistance (0.26) during the crisis period. The reason behind this may be either decreasing level

[10] Except India and Maldives, all SAARC countries have more than 80 percent dependence on remittances and official flows.
[11] Oil price and remittances have significant correlation of 0.20.
[12] It has an impact of decrease in oil payments as imported by SAARC countries.
[13] FX reserves in Bangladesh increased from 2.58 billion dollars in 2002 to 17.56 billion dollars in 2014
[14] See Cardarelli et al (2009).

of pressure on exchange rate appreciation due to stops in capital inflows or depleting level of reserves. As far as pre and post crisis periods are concerned, it is difficult to generalize the results because some of the countries such as Pakistan, Sri Lanka and Nepal where we observe increase level of intervention during the post-crisis period as compared to the pre-crisis period whereas in case of India and Bangladesh, our results show marginal decrease in exchange rate intervention during the post-crisis period as compared to pre-crisis period.

With respect to capital inflows and financial stability, we have another concept of sterilization. It is defined as the monetary operation through which a rise in net foreign assets is offset by decrease in net domestic assets, thereby keeping the monetary base constant, Gudmundsson and Heinrich (2008). Regressing change in Monetary Supply (MS) over change in Net foreign assets (NFA), we estimate sterilization coefficients for each of the SAARC countries over the quarterly period from 2002q1 to 2014q4. A value of coefficient equal to or more than unity implies full sterilization, whereas a value of zero represents no sterilization. As reported in Table 10, the results show that most of SAARC economies revert to more than 80 percent sterilization[15]. It is a common phenomenon mostly in pegged regimes as is the case in some SAARC countries. Unlike the case of surge in inflows, sterilization in these countries may be either to prevent depreciation or appreciation because the SAARC economies suffer from continual surge and stops in capital inflows. The reason for dual type of sterilization may be its high responsiveness to all types of capital flows other than FDI which reflect remittances as the main source of inflows, Aizenman and Glick (2008).

Table 10: Granger Causality (NFA, NDA, M2) and Sterilization

	BGD	IND	MDV	NEP	PAK	SL	BHU	AFG
Correlations (NDA, NFA)	-0.53*	-0.87*	-0.42*	-0.66*	-0.75*	-0.97*	-0.83*	
Cyclical Relation(NDA, NFA)	-0.43*	-0.88*	-0.43*	-0.54*	-0.78*	-0.96*	-0.83*	
G Causality	Yes	No	Yes	Yes	No	Yes	No	No
Sterilization index	0.57*	0.86*	0.37*	0.64*	0.85*	1.06*	0.78*	0.86*
R-squared	0.29	0.76	0.2	0.62	0.57	0.91	0.7	0.06

Section VII
Conclusions

Based on the foregoing analysis, it is concluded that SAARC countries face capital flows of not only of different magnitudes and but also of diverse durations. Besides exchange rate appreciation, the major problem for SAARC countries is volatility in capital flows. Even though the empirical exercise suggests push factors to be the major forces for capital inflows (outflows) to (from) the region, it is suggested that strong domestic fundamentals and institutions should be focus of the policy makers to make external flows more resilient. In the context of sustainable flows to low income countries, Alfaro et al (2004) emphasize on improving institutional quality which can help in shaping international capital flows over the

[15] Sterilization coefficient for Bangladesh and Maldives are 0.57 and 0.37.

long-run. Some other studies (e.g. Becker and Noone, 2008) suggest substitutability of different types of capital flows to reduce volatility.

Another interesting finding that capital flows, whether inflows or outflows, are generally asynchronous with each other. This shows that capital flows in SAARC countries are apparently prone less to common shocks and perhaps country-specific factors are more important, though other empirical exercise on pull and push factors does not explicitly suggest this. Since cyclical movements in capital flows occur at different points of time, SAARC regions should strengthen the existing mechanism for regional coordination (e.g. swap arrangements) so that countries facing severe stress in balance of payments due to volatility or drying up of capital flows can be helped by others.

Since remittances play a more critical role in smaller SAARC countries than others, they need to put in place appropriate policy to smoothen flows. In particular, the cost aspect being emphasized at the global level needs to be studied in the context of SAARC region and the scope for further intra-region coordination needs may be explored in this context.

Annex 1: Methodology to Measures Capital Flows Episodes

This section attempts to identify various phases of capital flow movements in SAARC countries and classifies them into surges, stops, flights and retrenchment based on the methodology originally suggested by Calvo (1998) and further developed in Calvo et al (2004 and 2008). Later the concept was modified and used in Cowan and Gregorio (2005), Reinhart and Reinhart (2008), and Forbes and Warnock (2010 and 2012).

Calvo et al (2004) construct monthly net private capital inflows, P_t , by subtracting monthly changes in international reserves from the quarterly current account balance. Then C_t is defined to be 12-month moving sum of lagged values and compute annual year-on-year changes in C_t as:

$$\mathrm{C_t} = \sum_{i=1}^{12} \mathrm{P_t} \qquad \mathrm{t} = 1, 2, 3, \ldots\ldots \mathrm{N} \qquad (1)$$

$$\Delta C_t = C_t - C_{t-12} \qquad t = 1, 2, 3, \ldots\ldots N \qquad (2)$$

The authors define the beginning of an episode at the month *t* when ΔC_t falls one standard deviation below its rolling mean, providing that at some point within the episode ΔC_t falls at least two standard deviations below its mean.

While using the same methodology, another series of papers as Rothenberg and warnock (2010), and Forbes and Warnock (2012) examine sudden stops and surges in capital flows. They use gross flows rather than relying on net flows proxies and cover waves of both inflows and outflows in order to analyse behaviour of domestic and foreign investors. Following the later methodology, we focus on episodes (surges, stops, flight and retrenchment) of gross flows and net capital inflows. Surges and stops waves reflect the behaviour of foreigners and flight and retrenchment are driven by domestic investors. We use quarterly data for SAARC countries over the period from 2002Q1 to 2014Q4 as shown in the equations[16]:

$$\mathrm{C_t} = \sum_{i=1}^{4} \mathrm{Inflows_t} \qquad \mathrm{t} = 1, 2, 3, \ldots\ldots \mathrm{N} \qquad (3)$$

$$\Delta C_t = C_t - C_{t-4} \qquad with\ \ t = 5, 6, \ \ldots\ldots N \qquad (4)$$

Now compute moving averages and standard deviations of $\mathrm{C_t}$ (Gross inflows or net inflows) over the entire sample[17]. Surge episode starts at quarter *t* when ΔC_t increases more than one standard deviation the moving average and ends when ΔC_t falls below one standard deviation above the moving average, providing that at some point within episode ΔC_t crosses two standard deviations above the moving average. Stop episode is defined to be starting at *t* when ΔC_t falls one standard deviation below the moving average, given that within episode ΔC_t falls below two standard deviation of the moving average. Waves of flight and retrenchment are identified respectively as sudden stops and surges by using gross capital outflows instead of capital inflows.

[16] Sample period for Bhutan and Afghanistan respectively start from 2006 and 2008.

[17] Forbes and Warnock (2012) use rolling means of the last 5 years.

Our main source of data (capital inflows and outflows in million US dollar) is International Financial Statistics (IFS) of International Monetary Fund (IMF) accessed through Haver Analytics. We define gross capital inflows as the sum of foreign direct investment, portfolio investment and others investments in the country and gross capital outflows as sum of foreign direct investment, portfolio investment and others investments abroad. Net capital inflows is defined as gross capital inflows minus gross capital outflows. The results for all SAARC countries are shown in Annex 2.1 and 2.2.

Annex 2.1: Stops, Surges, Flight and Retrenchment Episodes by country (2004-2014)

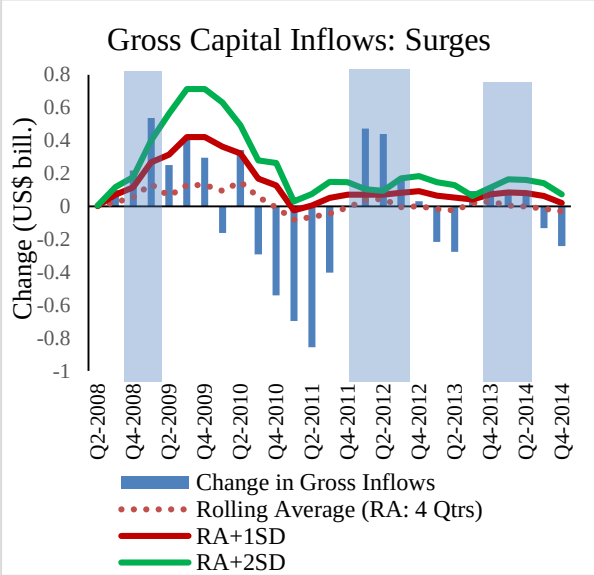
Country	Inflows				Outflows			
	Stops		Surges		Flight		Retrenchment	
	Start Date	End Date	Start Date	End Date	Start Date	End Date	Start Date	End Date
Bangladesh	2005q4	2006q2	2007q1	2007q2	2006q3	2008q1	2005q4	2006q1
	2009q2	2010q1	2008q2	2009q1	2009q2	2009q4	2008q2	2008q4
	2011q1	2012q2	2010q1	2010q3	2012q3	2013q3	2013q3	2013q4
			2012q4	2013q3	2014q2			
India	2006q3	2006q4	2005q1	2005q4	2007q4	2008q3	2004q3	2005q1
	2008q3	2009q4	2006q4	2008q2	2009q4	2010q2	2005q4	2007q1
	2011q3	2012q4	2010q1	2011q1	2011q4	2014q1	2007q2	2007q3
	2013q4						2008q4	2009q3
							2010q3	2011q4
Maldives	2008q1	2011q3	2004q3	2005q4	2004q3	2006q2	2006q3	2008q3
	2011q4	2013q4	2006q4	2007q1	2008q3	2012q4	2012q4	2014q1
			2007q3	2008q1	2014q2			
			2013q4					
Nepal	2004q3	2005q1	2005q4	2007q2	2004q3	2006q2	2008q3	2009q3
	2007q2	2008q2	2008q3	2009q4	2007q1	2008q2		
	2011q4	2012q2	2010q4	2011q2	2009q4	2010q4		
	2012q3	2013q3			2011q1	2012q3		
	2014q2				2013q3			
Pakistan	2008q1	2009q3	2004q4	2007q4	2005q4	2006q4	2010q2	2010q3
	2010q3	2013q1	2014q1		2009q4	2010q1	2011q2	2011q4
					2012q2	2012q3		
					2014q4			
Sri Lanka	2004q3	2004q4	2006q1	2006q3	2005q3	2007q3	2004q3	2005q1
	2008q1	2008q3	2012q1	2013q4	2010q1	2011q1	2007q3	2008q3
	2010q3	2010q4			2013q2	2014q1	2009q1	2010q1
	2011q1	2011q2					2011q2	2012q3
	2014q1	2014q3					2012q1	2013q2
							2014q4	
Afghanistan	Sample Period (2008q2-2014q4)							
	2010q3	2011q4	2008q4	2009q2	2010q2	2011q4	2008q4	2009q4
	2013q1	2013q3	2012q1	2012q4	2013q4		2012q1	2013q1
			2013q3	2014q3				
Bhutan	Sample Period (2006q1-2014q4)							
	2007q3	2009q3	2006q1	2007q3	2008q3	2010q3	2007q1	2008q2
	2012q3		2009q3	2012q2	2011q4	2012q2	2010q3	2011q3
					2014q2		2012q2	2014q2

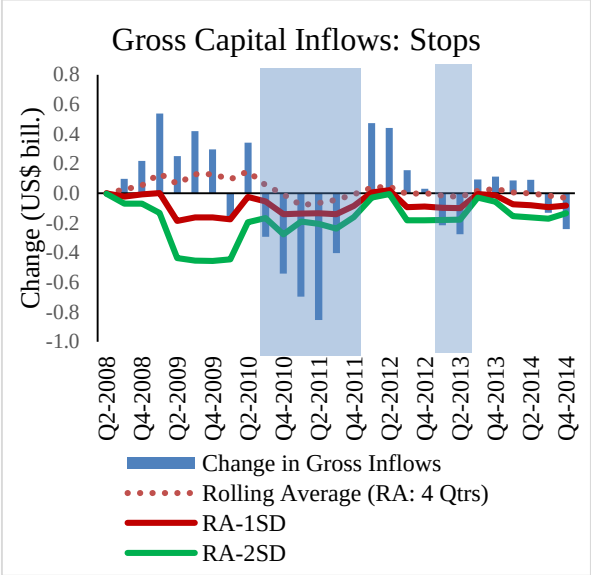
Annex 2.2: Stops and Surges, Episodes of Net Flows by country (2004-2014)

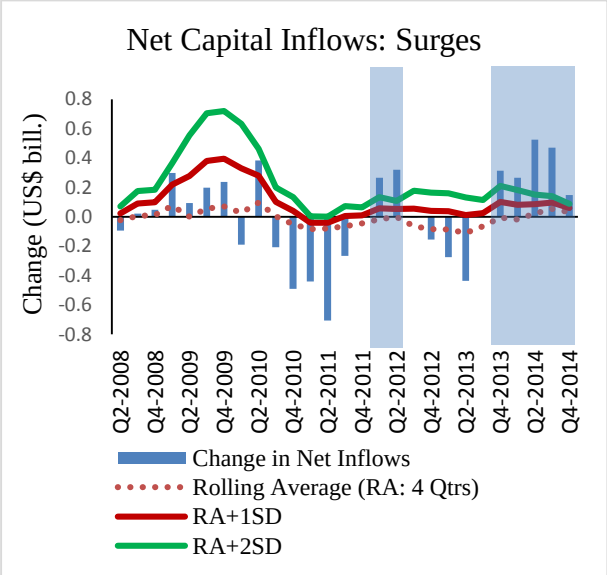
Country	Net Flows			
	Stops		Surges	
	Start Date	End Date	Start Date	End Date
Bangladesh	2004q4	2006q2	2006q3	2007q3
	2009q2	2010q1	2008q3	2009q1
	2011q1	2012q1	2010q2	2010q3
			2012q3	2013q3
India	2004q3	2004q4	2005q2	2005q4
	2006q1	2006q2	2006q4	2008q3
	2006q3	2006q4	2010q1	2011q1
	2008q4	2009q4	2014q4	
	2011q4	2012q1		
	2012q2	2012q4		
	2013q4	2014q4		
Maldives	2007q2	2011q1	2004q3	2006q2
	2012q2	2014q1	2011q3	2012q1
			2014q2	
Nepal	2007q2	2008q2	2005q1	2007q2
	2012q3	2013q3	2008q2	2009q1
			2009q3	2009q4
			2010q4	2011q2
			2011q3	2012q1
			2013q4	2014q2
Pakistan	2008q2	2009q3	2005q1	2008q1
	2010q3	2012q2	2013q3	
	2012q3	2013q1		
Sri Lanka	2004q3	2004q4	2005q3	2007q2
	2007q4	2008q3	2010q1	2011q1
	2014q2		2012q1	2013q4
Afghanistan	Sample Period (2008q2-2014q4)			
	2010q3	2011q4	2012q1	2012q3
	2013q1	2013q3	2013q4	
Bhutan	Sample Period (2006q1-2014q4)			
	2007q4	2009q2	2006q1	2007q3
	2012q3		2009q3	2012q2

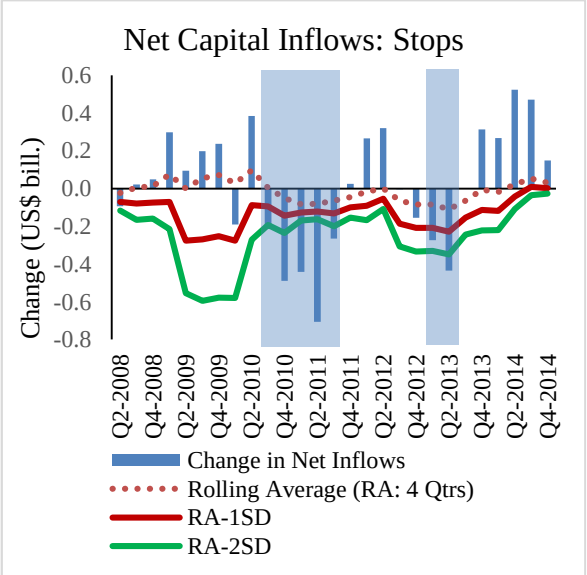
Annex 3: Graphical Presentation of Phases of Capital Flows in SAARC Countries

Afghanistan: Episodes of Surges and Stops

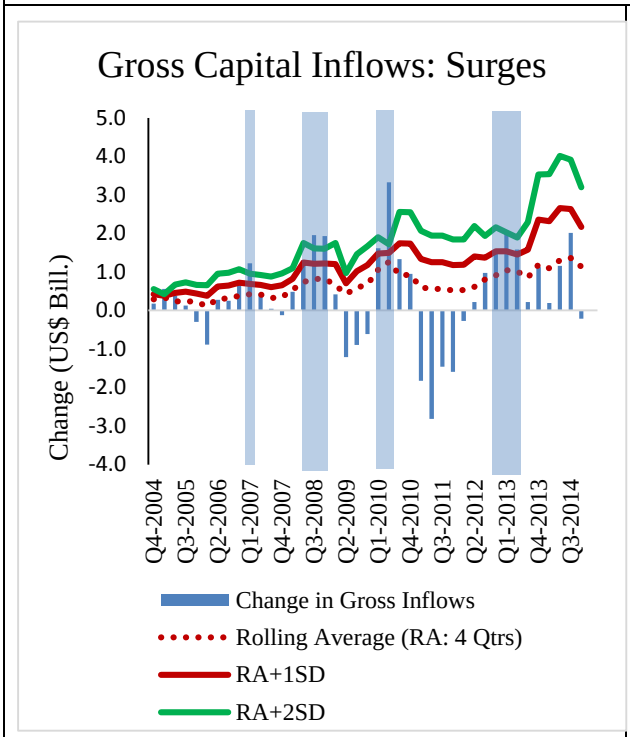


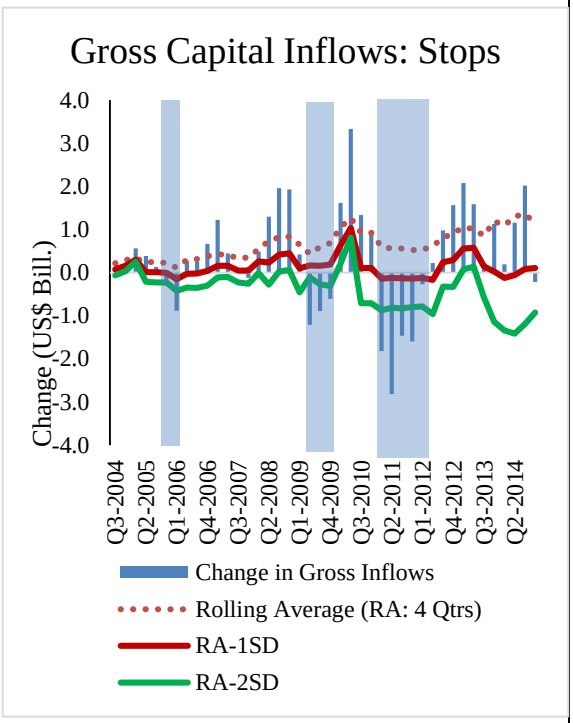


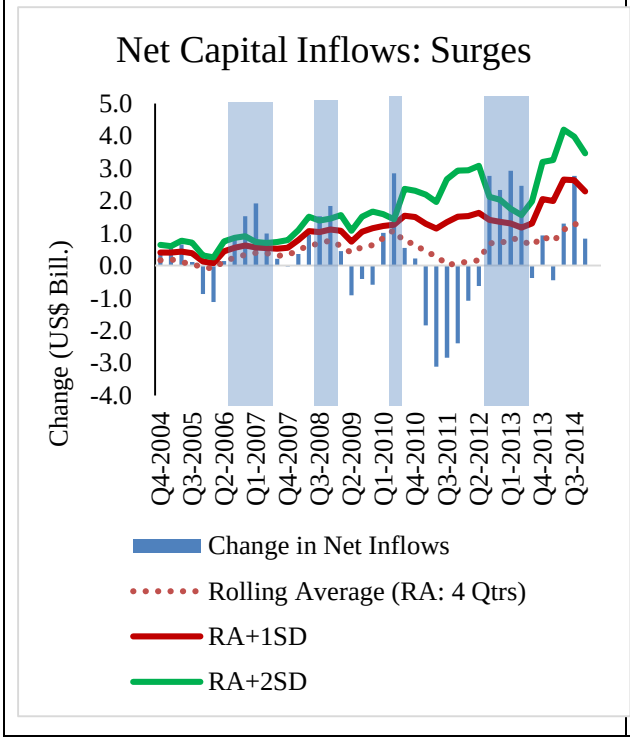


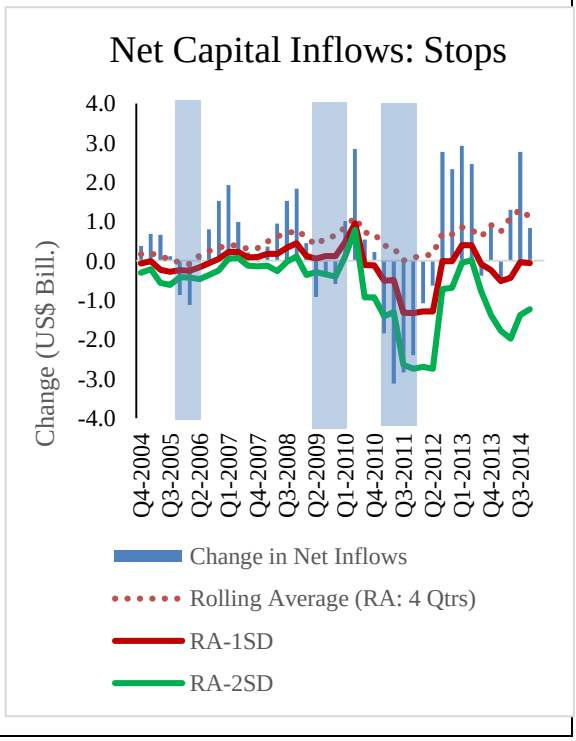


Bangladesh: Episodes of Surges and Stops

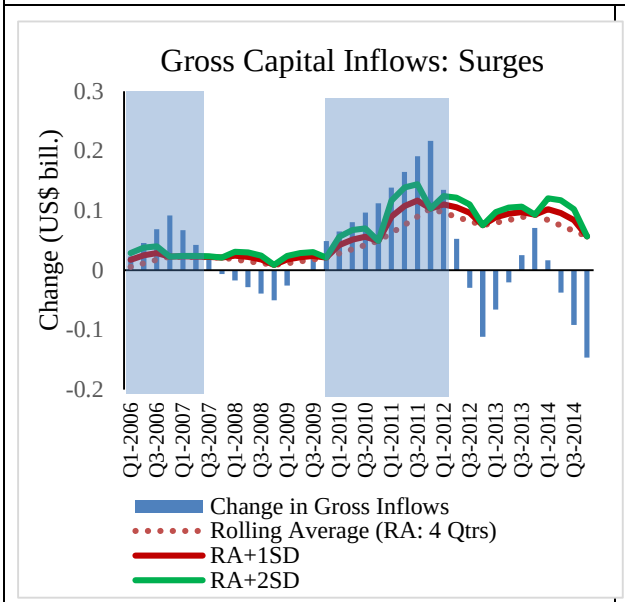


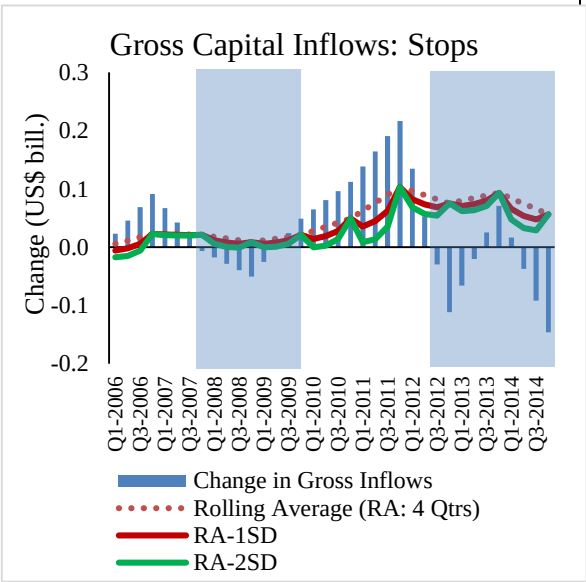


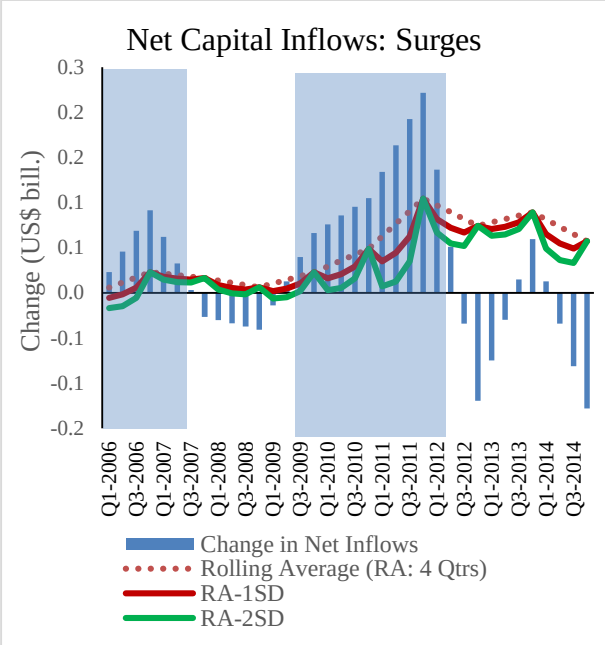


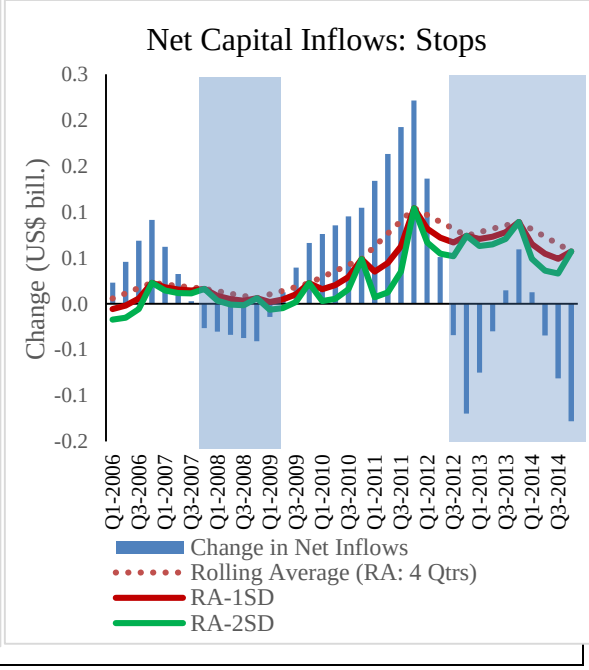


Bhutan: Episodes of Surges and Stops

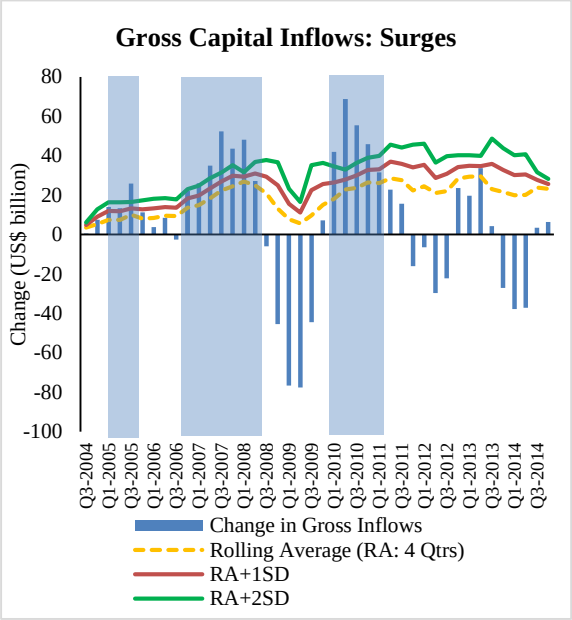


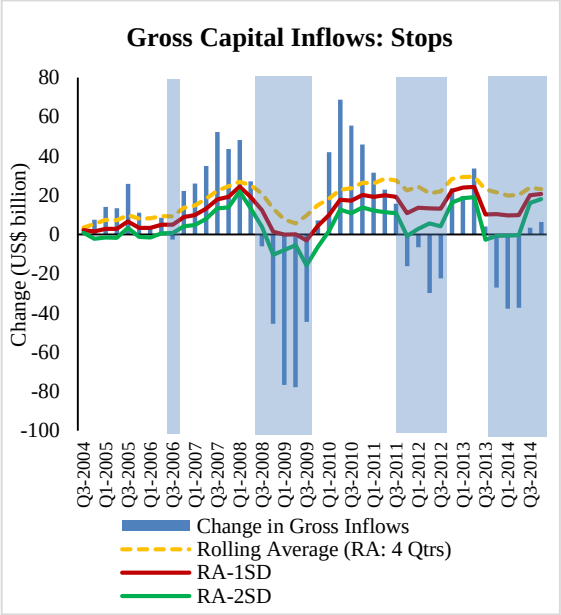






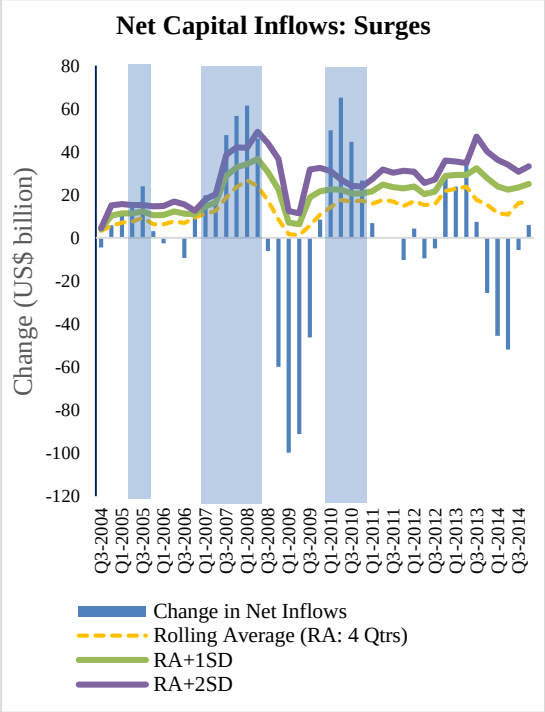
India: Episodes of Surges and Stops

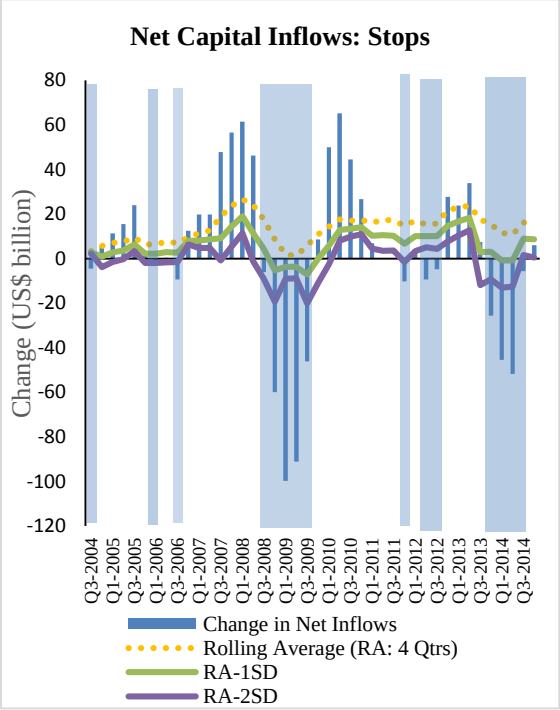




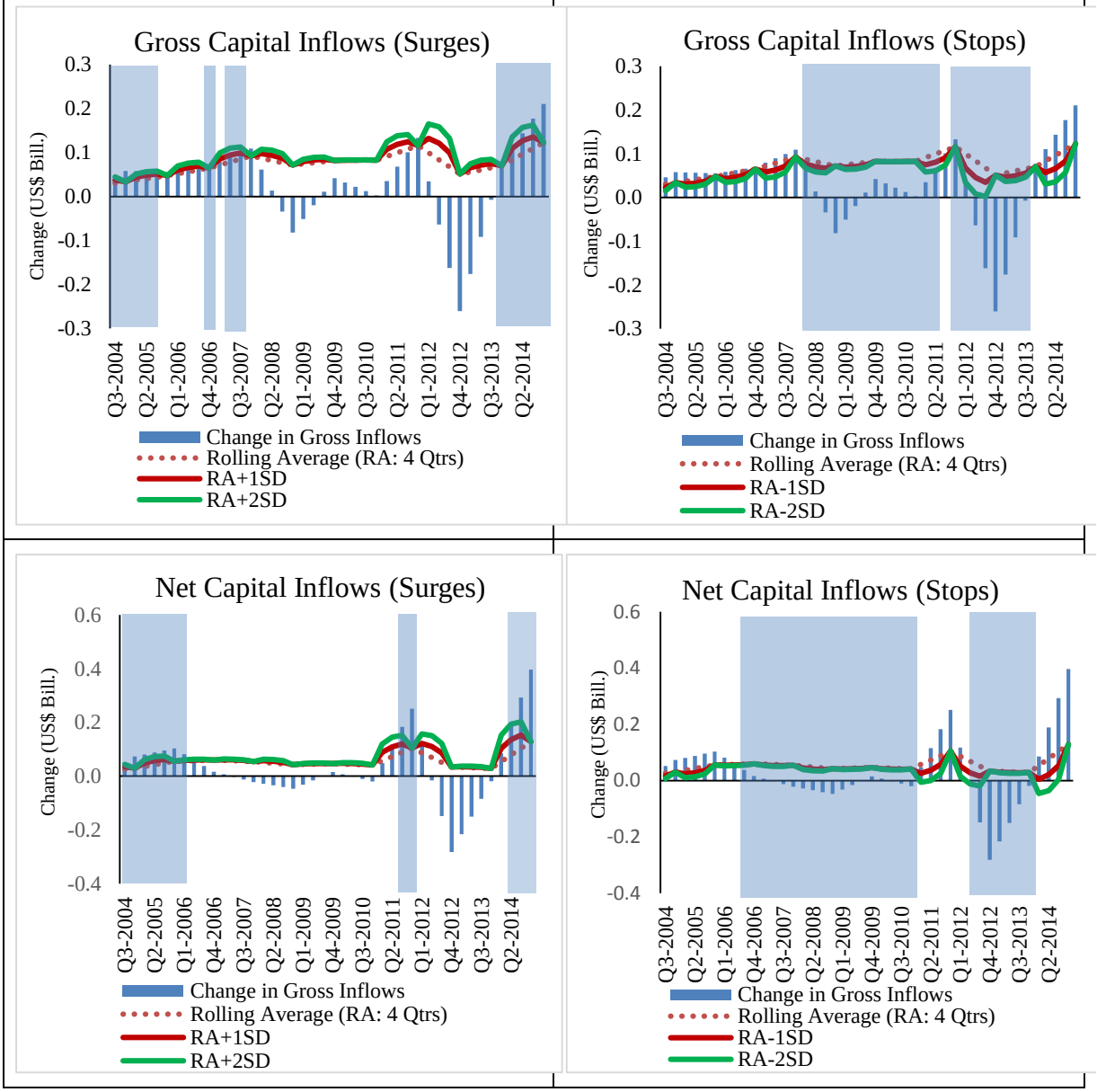
*based on 2004-05 base year series.

Net Capital Inflows in India

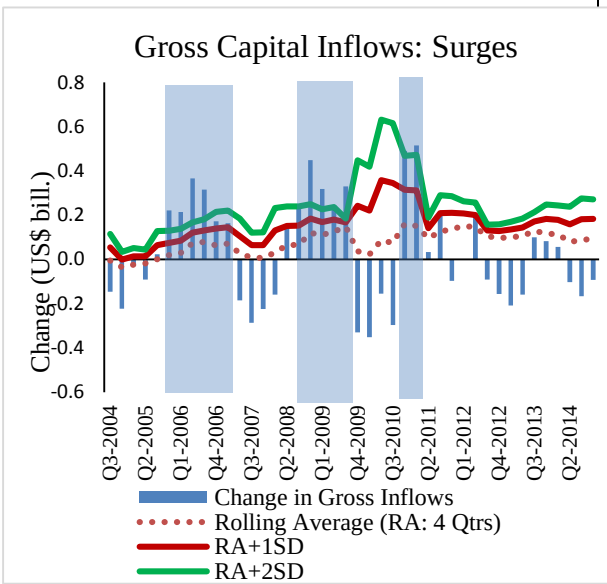


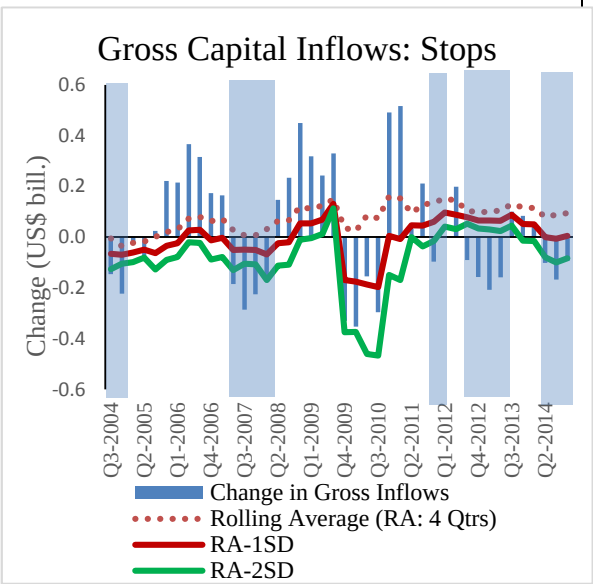


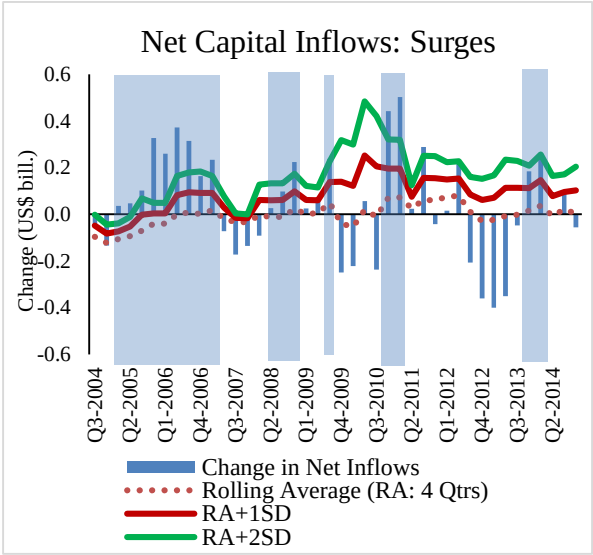
Maldives: Episodes of Surges and Stops

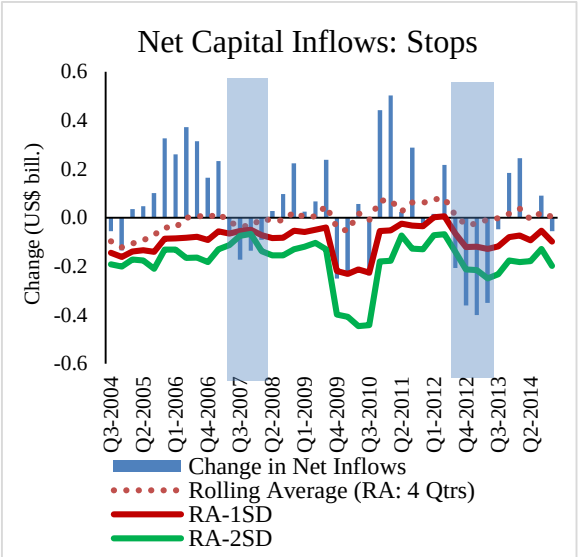


Nepal: Episodes of Surges and Stops

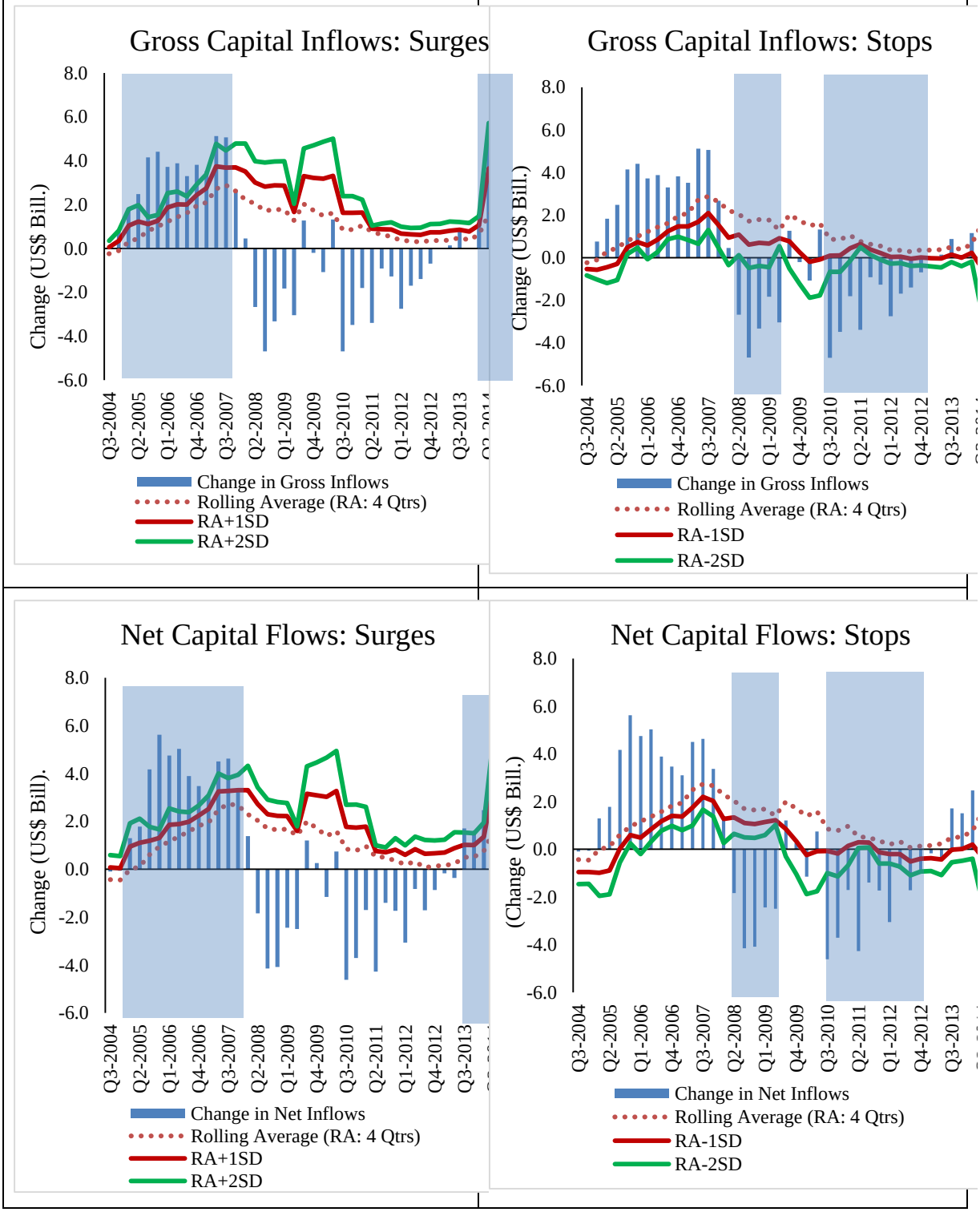




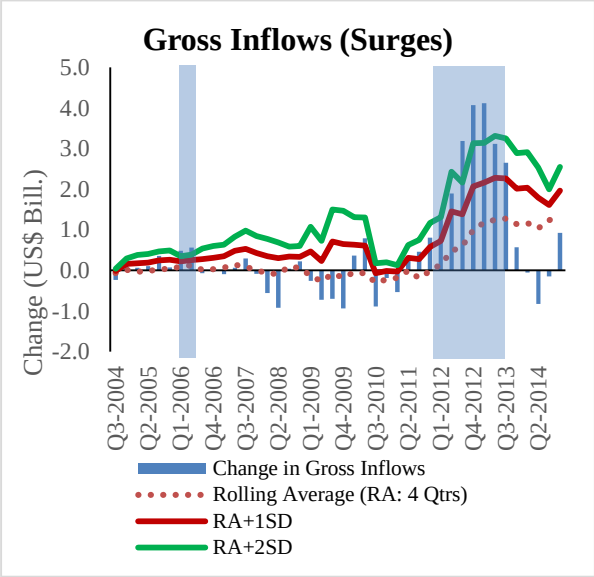


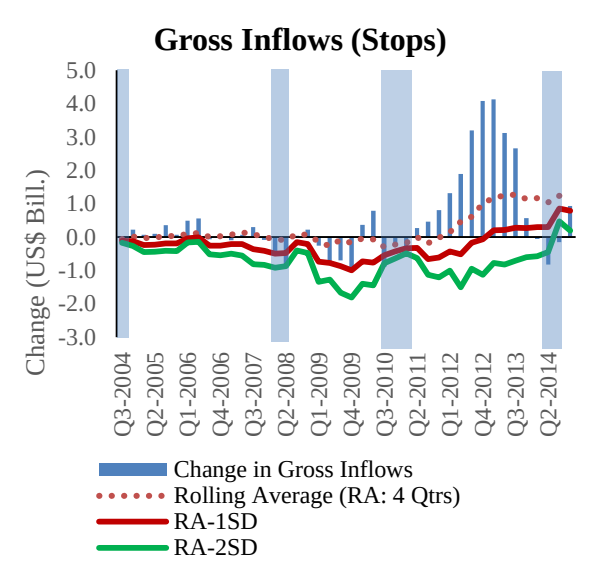


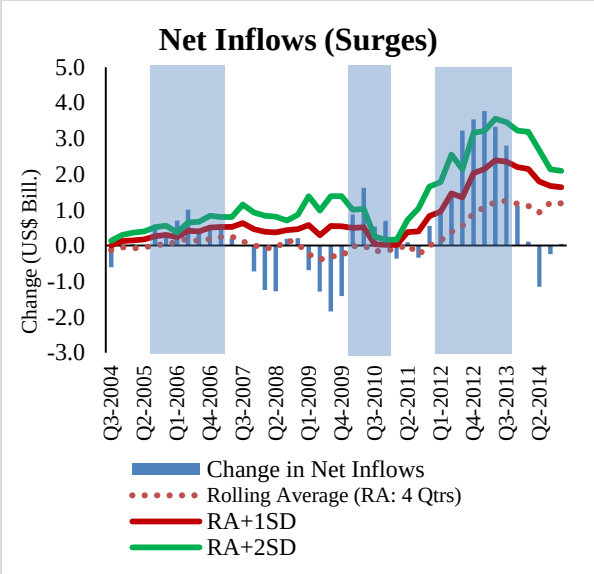
Pakistan: Episodes of Surges and Stops

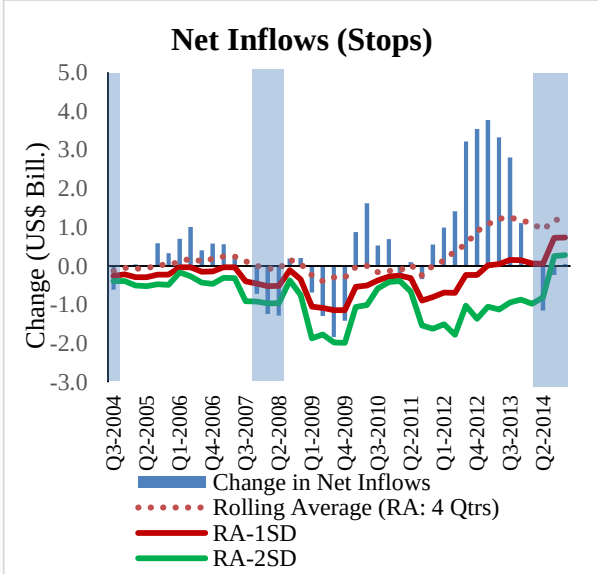


Sri Lanka: Episodes of Surges and Stops









Annex 4: Correlation Matrix of Cyclical Components of Gross Capital Outflows and Net Capital Flows

Gross Capital Outflows

	LBDCY	LINDCY	LNPCY	LPKCY	LSLCY
LBDCY	1.00	0.07	-0.03	-0.01	0.16
LINDCY	0.07	1.00	-0.01	0.37	-0.03
LNPCY	-0.03	-0.01	1.00	-0.05	0.02
LPKCY	-0.01	0.37	-0.05	1.00	-0.02
LSLCY	0.16	-0.03	0.02	-0.02	1.00

Net Capital Flows

	LBDCY	LINDCY	LNPCY	LPKCY	LSLCY
LBDCY	1.00	-0.02	-0.13	-0.01	0.03
LINDCY	-0.02	1.00	-0.07	0.01	0.11
LNPCY	-0.13	-0.07	1.00	0.04	0.07
LPKCY	-0.01	0.01	0.04	1.00	0.03
LSLCY	0.03	0.11	0.07	0.03	1.00

*: A correlation coefficient of 0.185 or more is statistically significant at 5 per cent.
Note: LBD, LIND, LNP, LPK, LSL represent Bangladesh, India, Nepal, Pakistan and Sri Lanka for which comparable quarterly data are available in IMF's BOPS.

Annex 5: Methodology for estimating Panel Results

Examining the impact of push and pull factors over capital flows, we estimate the following model for six SAARC countries over annual data period from 2002 to 2014[18].

$$Flows_{it} = Flows_{it-1} + Push\ factors_{it}\alpha_i + Pull\ factors_{jt}\beta_j + (c_i + \varepsilon_{it}) \qquad (1)$$

With $$Flows_{it} = \begin{cases} Gross\ Inflows \\ Net\ Inflows \\ Gross\ Outflows \end{cases}$$

$$Pull\ factors_{it} = \begin{cases} GDP\ Growth \\ Political\ Stability \\ Public\ Debt \\ Trade\ Oppenness, \\ Reserves\ Adequacy \\ Appreciation\ Expectation \\ Terms\ of\ Trade \\ Real\ Exchange\ Rate \\ Domestic\ Interest\ Rate \end{cases}$$

And

$$Push\ factors_{jt} = \begin{cases} Advanced\ Economies\ GDP\ Growth \\ Financial\ Stock\ Price \\ Libor \\ Oil\ Price \end{cases}$$

Where each of the dependent variable is standardized by each country's GDP. The list of explanatory variables is large but not exhaustive and the strategy is of constructing estimable equation for each type of capital flows selecting significant push and pull factors[19]. Pull and push factors are followed by c_i and ε_{it} representing unobserved component and estimation error.

The first specification of pooled Ordinary Least Squares (OLS) assumes that individual's observations over time are observations from different individuals (countries). This approach is reasonable in case when the size of cross-sectional samples is small[20]. The OLS specification is followed by running Breisch-Pagan Langrange Multiplier (LM) test to know whether there are individual-specific effects. Next, the Hausman test is applied to decide about the reliability between Random Effect (RE) model and Fixed Effects (FE) model. The LM and Hausman tests suggest in favour of pooled OLS which may be reasonable in this case of small cross-sectional sample.

[18] Data for Afghanistan and Bhutan over the entire period are not available.

[19] Leamer (1985) sensitivity test is applied for variable selection. In this analysis model with different variables are tested and records changes in the sign and significance level of coefficient of the concerned variable.

[20] http://www.ub.uni-bamberg.de/elib/volltexte/2004/3/GH-Chap-2.pdf

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