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Capital flows volatility and subsequent financial crises in EMEs

New perspectives in the changing landscape of economic globalisation

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This thesis paper examines the impact of volatility of international capital flow on emerging market economies (EMEs). The paper addresses the relationship between short-term capital flow surges, such as portfolio investment and debt inflows, their volatility and impact on economic growth. The research is based on theoretical and empirical foundations for a selected number of EMEs, which experienced great capital flow volatility and crises in the past 3 decades. The main results of the paper illustrate that liberalization of short-term capital flows to the economies with weak financial regulation and capital controls as well as low quality of institutions can lead to economic crashes, financial crises, macroeconomic imbalances and raise financial stability risks.

Thesis paper also examines the domestic debt composition of EMEs and essentially determines how debt composition impacts the dynamics of capital flows and their volatility in EMEs, thus, causing macroeconomic disturbance or even financial crises. The main results of the paper showcase that volatility of capital flows could lead to financial instability and macroeconomic imbalances, thereby contradicting the very essence of the neoliberal policy agenda.

Therefore, key results of the research demonstrate that there is a need for more robust policies and capital controls to tackle large short-term capital inflows and outflows amid the rising volatility of short-term capital flows in EMEs.

Keywords	EMEs, short-term capital flows, volatility, surges, financial crises, sudden stops and capital controls

Contents

1   Introduction

The neoliberal policy agenda has been the major policy approach in both emerging market economies (EMEs) and advanced economies (AEs) for the last three decades: since the 1980s, many EMEs have experienced a strong trend towards financial liberalization and, therefore, have adopted policies in order to advance domestic competition by deregulation and openness to foreign capital. According to the index of competition, which accounts for structural reforms toward financial liberalization, countries such as Chile brought the value of the index to the levels of frontier economies and the USA in particular (Ostry et. al., 2016). While some may point out the considerable benefits of financial globalization, e.g. that it channels international capital flows to its most productive areas, while promoting risk-sharing and economic growth by removing barriers toward integration within financial sector, such evidence is less clear-cut for EMEs (Ostry et. al., 2016). Indeed, many EMEs were going in the direction of financial globalization and even a step further, into the financialization of their economies. Being qualitatively different term from 'globalization of finance', financialization is associated with the Anglo-Saxon world, that is the advanced economies such as those of US and UK. The causes of financialization in EMEs that can be quantified are foreign financial inflows, the shift from bank-based to market-based financial systems, financial liberalization, which spurs asset price inflation and increases debt, and household indebtedness among other factors (Karwowski and Stockhammer, 2016). Nevertheless, financialization in AEs and EMEs was highly criticized by many economists and policy makers. For example, Arcand et. al. (2012) emphasized that there can be "too much" finance even in AEs, meaning there can be a threshold beyond which financial depth and its development has no beneficial outcomes for economic growth. Thus, capital inflows to EMEs constitute a major part of financial integration and in some cases financialization of EMEs that has brought more damaging consequences rather than positive ramifications for economic growth.

Another aspect concerns the type of flows that are being considered: while long-term capital flows, such as Foreign Direct Investment (FDI) and other equity flows, do seem to boost long-term economic growth in AEs and EMEs, short-term flows, such as Foreign Portfolio Investments (FPI) and portfolio debt inflows, are rather volatile in nature and neither do promote long-term growth nor share risks with other trading partners (Ostry et. al., 2016).

The integration of EMEs into the global economy is thus characterized by the pro-cyclical capital inflow cycles that were followed by sudden economic crashes. The most prominent of those 'sudden stops' – sharp slowdown of private capital inflows and reversal into small current account deficits – were the 1990's crises that happened in Latin America and East Asian countries, such as the 'Tequila crisis' in Mexico in 1995, the East Asian financial crisis of 1997-1998, followed by the crisis in Russia in 1998, Brazil in 1999 and Argentina in 2001 (Bonizzi, 2013). Therefore, the academic debate is now focused on the relationship of capital inflow volatility, its determinants and macroeconomic imbalances in EMEs. The research focus of this thesis paper is on the volatility and surges in short-term capital flows such as FPI, debt, banking and other flows as they are more volatile in nature than long-term flows such as FDI.

In order to study and test such interdependency, it is necessary to understand the key drivers for surges of short-term capital inflows and sudden outflows. This thesis paper emphasizes that the drivers for capital outflows in the current macroeconomic environment vary by the type of inflow and, therefore, cannot be applied universally. The conceptual framework for understanding the dynamics of capital flows is constructed within a "push" and "pull" framework, where push factors are usually global factors that affect all EMEs while pull factors are domestic ones and refer to the attractiveness of various countries for investment opportunities (Moghadam et. al., 2011). Push and pull criteria are also considered along with cyclical and structural factors. The main argument of the thesis paper is that international short-term capital flows mostly have an adverse impact on long-term economic growth in EMEs with weak financial systems and consequently could lead to macroeconomic imbalances or even financial crises, as was evidenced in the empirical analysis of secondary research sources.

This thesis is structured as follows: chapter two provides comprehensive literature review on the topic of capital flows in EMEs and the academic debate on capital flows liberalization following the volatility of short-term capital inflows; chapter 3 presents a conceptual model – the "push" and "pull" framework – and a model for measuring the volatility of capital flows as well as the relationship of capital inflows and crises in EMEs adapted from Ghosh et. al. (2016) for empirical analysis of the EMEs, which experienced macroeconomic disturbance as a result of short-term surges of capital flows, and the behavior

of capital flows and economic growth in selected EMEs, building on the previous available literature and models; chapter 4 delivers the analysis of capital flows over time, by type and source of flow, individual flows components, the results of push and pull framework analysis as well as examination of EMEs debt structure and dynamics of short-term capital flows, increased participation of foreign asset managers and other investors in EMEs local currency bonds and accumulating international reserves, outlining key drivers, possible spillover effects from AEs to EMEs; chapter 5 gives some policy implications, relying on the main findings of the previous research of this paper and findings from major institutions such as International Monetary Fund (IMF). Finally, the last chapter gives a short summary that concludes the analysis of short-term capital flows, their volatility and adverse consequences for EMEs.

2   Literature Review

2.1   Research question and its relevance

Recently the academic literature experienced a shift in thinking and analysis of international capital flows to EMEs and their effects. As EMEs were becoming more integrated in the world economy and opened for foreign capital, they started to exhibit high volatility of short-term capital flows, which has resulted in several economic crashes. The fundamental problem of financialization in EMEs, according to Epstein (2005, p.12) is all about *"speculative and excessively liquid financial flows that create debt-laden balance sheets, overly short-term perspectives, volatility and mispricing of important asset prices, including exchange rates, and subsequent misallocation of resources and unstable economic growth".* Therefore, the need for capital controls has gained importance again in the current academic literature and research from major international organizations such as the IMF.

One of the prominent shifts was the paradigm change in the IMF Finance and Development report, published in June 2016, and dedicated to Africa, in particular the article '*Neoliberalism: Oversold?'* (Ostry et. al., 2016). Traditionally being the advocates of financial liberalization, IMF authors now argue that capital inflows to EMEs and financial liberalization do not necessarily yield beneficial results, such as greater economic growth and risk-sharing with trading countries. According to the article, it is rather dependent on

the type of inflows being considered: while long term inflows, such as FDI, do seem to provide economic value to the countries with weak institutions and financial systems, short-term inflows, such as FPI, banking and other debt flows, on the other hand, do not seem to boost economic growth but rather increase financial volatility and crisis frequency. Ghosh, Ostry and Qureshi (2016) have published a paper in the *American Economic Review*, where they have indicated the synchronized behavior of capital inflows and consecutive crash landings, with the major crises that happened in 1997 – the Asian Financial Crisis –, 2007-2008 – the Global Financial Crisis –, 2011 – the European Sovereign Debt crisis and US sovereign debt downgrade –, and 2013 – the "Taper Tantrum" –, which had negative spillover effects on EMEs and some of their currencies.

This thesis aims to tackle the research issues raised in the previous and emerging literature and the IMF publication mentioned above in particular. The question of cyclical behavior of short-term capital flows and subsequent economic disturbance has some evident policy implications for EMEs that raise the importance of capital controls and risk management in general. Considering a little amount of literature by comparison in major economic and financial academic journals in the last decade that would address such problem, this paper addresses this research gap by theoretical and empirical analysis, yielded from secondary sources, of the relationship between volatility of short-term foreign capital flows and crises in some EMEs, particularly in BRIC economies. More specifically, the main research questions of the paper are the following:

1) **Is there a cyclical relationship between short-term capital flow surges, such as portfolio investment, banking and other debt flows, their volatility and subsequent economic disturbance in EMEs, leading to potential financial crises?**

2) **What policies and prudential measures shall be implemented to tackle capital flow volatility in EMEs?**

Foreign capital flows are characterized as among the most important ingredients of financial globalization and the main driver for economic growth (Carp, 2014). Thus, in order to answer the above questions, it is necessary to understand the relationship between foreign capital flows and economic growth in EMEs. Although such a relationship is rather complex, the paper takes into account the considerable amount of previous

literature on the topic of capital account liberalization and applies it to answer the research questions above.

2.2　The research problem and the relevant literature

The research gap among academic literature in the last decade lies in the relationship between surges of short term capital inflows, their volatility and subsequent crises in EMEs. While some authors from the IMF have already started to address this issue, this paper builds on their findings and on more general academic debate on the efficacy and beneficial impacts of short-term capital flows.

Although there is a little amount of literature by comparison after Global Financial Crisis (GFC), dedicated to the relationship between short-term capital inflows surges and economic disturbance and crises in EMEs, there is a vast amount of academic literature on financial globalization and capital account liberalization as well as its implications to EMEs. The main sources of literature, reviewed and analyzed below, are coming from EBSCOhost online database, Business Source Elite in particular. Out of 218 search results for "capital flows_emerging markets" that constitute a full sample of available literature on capital flows to emerging markets, the most promising and appropriate papers are found in various academic journals, such as American Economic Review, Journal of International Money and Finance, Journal of Banking and Finance, Procedia Economics and Finance, and The Quarterly Review of Economics and Finance. In addition, the research from international organizations, such as IMF, Bank for International Settlements (BIS), National Bureau of Economics Research (NBER) are very valuable for the analysis of ongoing changes in the macroeconomic environment and advancements in certain policies concerning capital flows in EMEs. The more specific streams of literature could be characterized in the following segments: the macroeconomic effects of equity and debt capital flows to EMEs; the key drivers and determinants of capital flows volatility with regard to different kinds of flows; the relationship between capital flows volatility and economic growth and, lastly, controls on capital inflows and outflows, their applicability and consequences.

More generally, the paper derives the research from the literature streams that could be summarized as in the Figure 1 below:
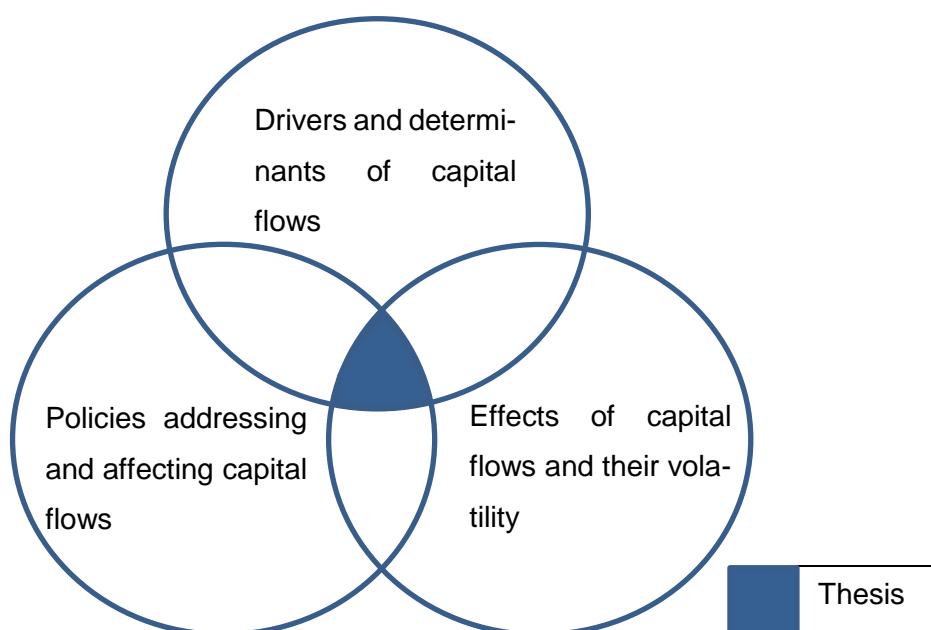

Figure 1. General Literature streams. Source: International Institute of Finance (IFF), 2015; own research.

The crises of 1990s have alerted policy makers and academia that short term capital inflows could bring more economic volatility and result in crises. After the East Asian financial crisis in 1997, the IMF (1998) has proposed that short-term capital controls, in particular taxes on short-term inflows, are perhaps beneficial in promoting more capital inflows to EMEs. However, it was still a light touch on the effects of short-term capital flows on EMEs: the relationship between short-term inflows volatility and economic growth had to be analyzed further due to lack of data for empirical analysis.

The most prominent critic of neoliberalism and its advocates such as IMF and World Bank, Joseph Stiglitz (2000) has made a clear statement on regulation of short-term capital flows after the East Asian crisis of 1997. In his work titled "Capital Market Liberalization, Economic Growth and Instability" (2000), Stiglitz has questioned the applicability of full capital account liberalization, particularly stressing the importance of imposing interventions on short-term capital flows that are more volatile than e.g. FDI, as was implemented by China and India – countries less affected during East Asian crisis of 1997 – where China "has managed to attract huge amounts of foreign direct investment

while maintaining controls on short-term capital flows" (Stiglitz, 2000). Moreover, Rodrik and Velasco (1999) also studied short-term capital flows by conducting theoretical, stylized model and empirical study, following the aftermath of the East Asian crisis of 1997. They have concluded that the "potential of illiquidity was at the center of recent crises, and that short-term debt is a crucial ingredient of illiquidity". However, due to ambiguous empirical evidence of their study, certain macroeconomic policies were still a subject to be defined in a more concise manner, as more prudential monetary and fiscal policies as well as greater transparency in local financial system can only be advantageous in reducing risks. (Rodrik and Velasco, 1999)

Nevertheless, as short-term capital inflows to EMEs surged from 2000 to 2004, the idea of capital account liberalization and its beneficial aspects has again become a major theme of macroeconomics research. For example, Kaminsky (2005) highlighted the fact that "*the explosion of capital flows to emerging markets in the early and mid-1990s and the recent reversal following the crises around the globe have reignited a heated debate on how to manage international capital flows".* She nevertheless concluded that financial globalization in EMEs has provided higher economic growth and productivity, with capital flows advantages to move to the most attractive destination (Carp, 2014).

However, after the GFC that started in the USA in 2007 and had enormous spill-over effects to other AEs in Europe as well as EMEs across the continents, the need for robust policies, capital controls and risk management gain an utmost importance for both, policy makers and academics. For instance, Mohan (2009) stressed in the BIS report that the failure to understand the risks of excessive capital flows has, in one way or another, diminished the financial stability in EMEs, especially after the GFC, from 2007 to 2009. It was also highlighted that equity flows, such as FDI, do seem to be beneficial in nature, as they provide risk dispersion and expertise of foreign firms, e.g. in the form of human capital (Mohan, 2009). However, the effects of debt inflows were more ambiguous and open for debate.

Therefore, the type and source of inflows is considered to play a major role in determining the relationship between capital inflow surges and economic crashes in EMEs. According to Arias et. al. (2013) from the BIS, the GFC brought very important changes in the analysis of the behavior of international capital flows and their volatility; the latter became a challenge for policy makers as the negative consequences from capital flows volatility

affected some of the key macroeconomic indicators such as GDP growth, foreign exchange rate and financial stability overall. The results of their research suggest that traditional push and pull factors, or global and domestic ones, still play a key role in the analysis of capital flows behavior, although the importance of those factors depend on the type of flow that is being considered (Arias et al., 2013). A more recent study from Ghosh and Qureshi (2016) also emphasizes that the source of capital flows – flows induced by residents (asset flows) or non-residents (liability flows) – is an important factor in studying the relationship between short-term capital flows surges and financial crises in EMEs. Thus, this paper takes into account the push and pull framework as well as distinguishes different types and sources of flows for the conceptual model. In addition, Broto et. al. (2011) have also emphasized that global determinants of all types of inflows have gained in importance within the academic literature and are complicated with the conflicting effects of various domestic factors on the volatility of the various types of capital inflows. Although some of these domestic factors may be tackled by policy-makers, it is not easy to identify a single policy track to reduce volatility across many EMEs, which, along with the increasing importance of global "push" factors, could explain why some EMEs have chosen to "hedge" against the risk placed by the effects of volatility rather than to address the roots of such volatility within their domestic factors (Broto et. al., 2011).

This brings the analysis to the policy question, more specifically the applicability of capital controls for the short-term capital inflows. Capital controls have been a hot topic for academic research after the major crises incidents in 1990s, 2008 and the current slowdown in international capital flows. The IMF (2011) has summarized the experiences in managing capital flows in major EMEs: according to its research, short-term capital inflow surges can lead to macroeconomic disturbance and carry risks of financial distress, at least for EMEs with underdeveloped financial institutions and weak macroeconomic fundamentals. Therefore, it may be useful for several countries to consider prudential measures or capital controls in response to capital inflows (Moghadam, 2011).

In addition, Li and Rajan (2015) have analyzed the panel of 37 EMEs for the period from 1995 to 2011, in order to figure out the effectiveness of capital controls on the volatility of gross equity flows, in particular the FPI and FDI. According to their results, the controls on equity outflows, notably on FPI outflows, rather than on equity inflows, have a greater

effect on reducing the volatility of equity inflows, notably FDI inflows, suggesting a shift to long-term flows such as FDI (Li et. al., 2015).

This thesis contributes to the current literature with the analysis of the relationship between short-term capital inflow surges and economic crashes in selected EMEs, particularly BRIC economies. Although today's literature on capital flows in general is vast, firstly it lacks the research on the above-mentioned relationship between surges of short-term flows and financial crises in EMEs, and secondly, it is deficient in more in-depth analysis of the impacts on the EMEs where short-term capital inflow surges resulted in economic crashes and sudden stops, as those EMEs have experienced substantial economic volatility and a surge of short-term capital flows prior to each crisis episode.

2.3   Research methods

The research methods of the thesis are limited to the retrieval and use of secondary data: that is to all the literature that is available in the academic journals online or in physical libraries, given limited access to certain databases. Methodology of current thesis research is constructed within the available conceptual frameworks, such as push and pull framework for analysis of capital flows as well as adopted volatility models to study the relationship of capital inflow surges and crises likelihood that will be properly presented in Chapter 3 – the conceptual model.

Considering the analysis of the selected literature streams that are presented earlier in the literature review, this thesis analyses various models for the analysis of capital flows. To answer the first research question, that is to find out whether there is a cyclical relationship between the surges of short-term capital inflows and financial crises, it is important to determine the drivers of the volatility of short-term inflows, such as FPI, banking and other debt flows, and their impacts on economic growth in EMEs. In total, the sources and determinants of the volatility of capital flows, types and sources of flows, in this case short-term capital flows, are the main units of analysis to determine the relationship of capital inflows surges, economic growth and financial crises in a more general spectrum of EMEs. Lastly, with the answer to the first research question, it would be possible to assess the effectiveness of capital controls and other prudential measurers in the current environment of slow growth, particularly slowdown of capital flows to EMEs.

Such analysis would include the use of quantitative econometric models, however, due to research limitations, the paper would rely on the existing volatility models and interpretation of the main results of the quantitative research from secondary sources. The thesis adopts the methodology of Ghosh and Qureshi (2016), which quantifies the relationship between capital flows volatility, surges of short-term flows and consequent crises episodes in selected spectrum of EMEs; thesis also uses the most recent IMF publication from Pagliari and Hannan (2017), which provides most up-to-date volatility models with data, to measure the volatility of capital flows in EMEs and foresee the consequences for policy implications. Therefore, this thesis uses a mix of quantitative and qualitative research, relying on the most suitable research publications that have recently emerged in the changing macroeconomic and geopolitical environment.

3 Conceptual Model – Key Determinates and Measurements

The following chapter presents the theoretical foundations for the analysis of capital flows, that is the conceptual model as the tool for analysis of capital flows surges, volatility, economic growth and crises in EMEs, particularly in the BRIC economies; more specifically, it introduces the unit of analysis, that is the type of capital inflows that is relevant for further research, the definition of surge of capital flows as well as dependent and independent variables that affect the unit of analysis. Such a model would help to further outline the empirical model for the relationship between capital flows and economic crashes.

3.1 Theoretical framework – 'push & pull' and cyclical & structural factors

The key variables are defined as follows: capital inflows represent the acquisition of domestic assets by foreign nonresidents; capital outflows are defined as the acquisition of foreign assets by residents of EMEs and net capital flows are the difference between capital inflows and outflows (Ghosh et. al., 2016). Capital flows to EMEs have been analyzed under various models and frameworks. However, the most common conceptual model for analysis is the "**push** and **pull**" framework. Push factors are those that relate to global factors, such as the global risk appetite and world interest rates, while pull factors are domestic ones that constitute attractiveness of a certain destinations for investment opportunities (Moghadam, 2011). Push and pull framework was first introduced to

analyze migration and its structural factors in the macroeconomic environment. Those factors have gain in significance after WWII with world population increase from 2 billion people in 1945 to over 7 billion today (Stanojoska, 2012). Those factors are also interpreted within cyclical and structural dimensions:

	Cyclical	Structural
Push	• Near zero interest rates in AEs, notably in US • Low global risk aversion • Slow AEs' output growth	• Portfolio diversification • Rise of institutional investors • Information and communication technology
Pull	• Domestic output growth • Low commodity prices • High domestic interest rates	• Trade openness • Quality of institutions • Capital account openness

Table 1: Push and Pull factors for the analysis of capital flows – based on the various sources.

Table 1 above summarizes the main drivers for capital flows to EMEs from the research of the IMF (2016) and International Institute of Finance – IFF (2016). The Pull drivers constitute the dependent variables that are being studied in this paper to determine the relationship between capital flows surges and crises. Push factors are more global and therefore independent variables that will have an impact on the relationship between the capital flows surges and crises in EMEs, which is the topic for this thesis. The theoretical hypothesis on how they relate to each other is thus constructed around the cyclical and structural factors in Table 1 above.

In addition to the factors for capital flow analysis, it is necessary to distinguish between various types of capital flows and specify a unit of analysis. As different fundamentals outlined in the table 1 above vary in significance to the various types of flows, this thesis focuses on short-term capital flows, such as portfolio debt and equity inflows and other debt inflows, as their surges have caused higher volatility and eventually crises in certain EMEs (Ghosh et. al. 2016).

The units of analysis of this paper are types of flows, such as FPI, banking and other debt inflows, the latter being non-portfolio net private flows. This categorization is outlined according to the National Bureau of Economic Research – NBER (1998) in Figure 2 below as well as Ghosh and Qureshi (2016) analysis of source of flows:
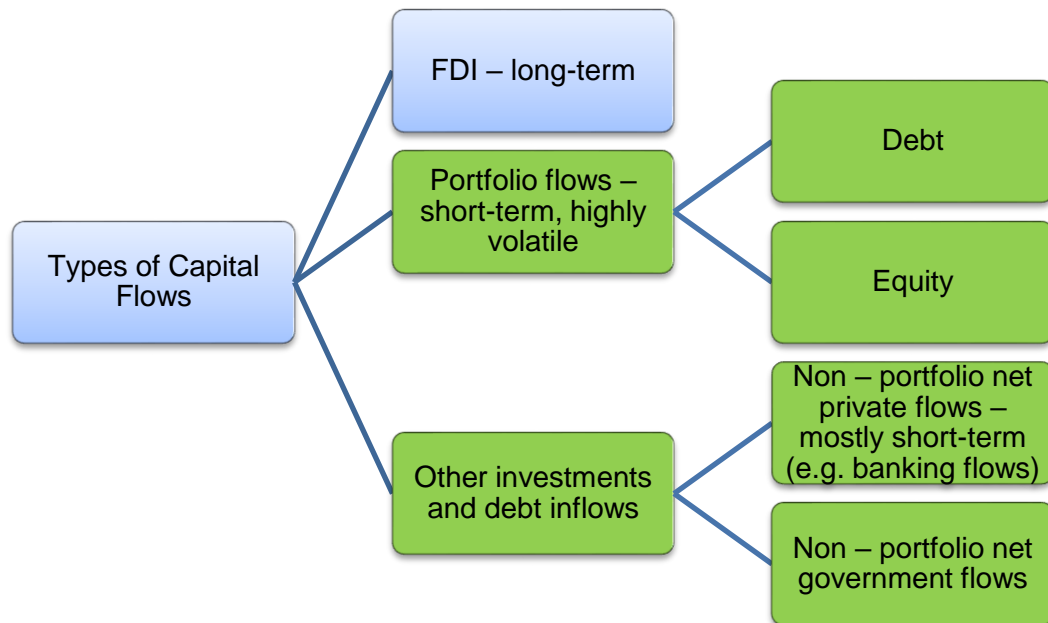

Figure 2: The highlighted types of short-term flows in green are being analyzed. Source: adapted from NBER (Bacchetta and Wincoop, 1998).
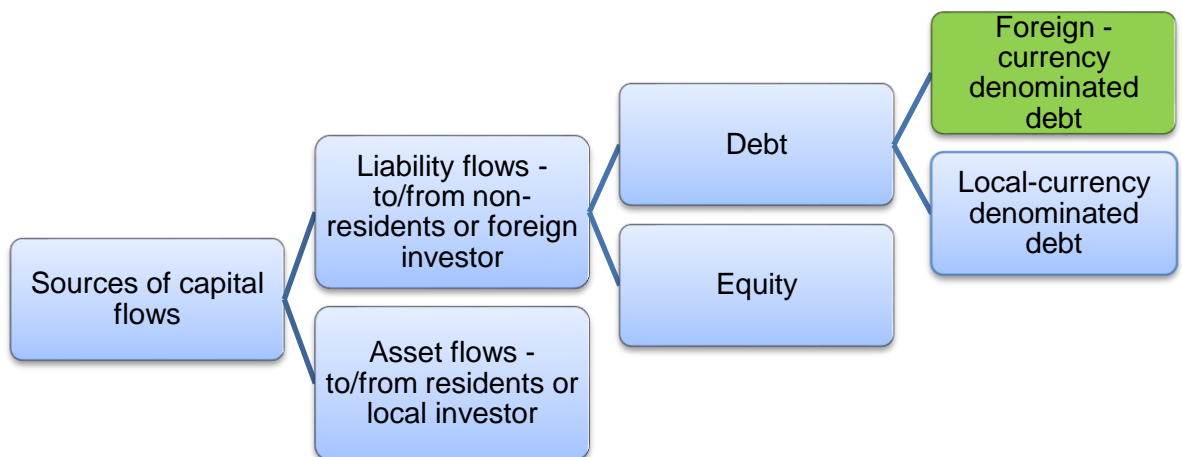

Figure 3. Breakdown of sources of flows. The highlighted types in green are being analyzed. (Ghosh and Qureshi, 2016).

The definitions of each major group of flows is taken from recent IMF working paper by Pagliari and Hannan (2017, p.8):

1) 'Foreign Direct Investments (FDI), "a category of cross-border investments associated with a resident in one economy having control or a significant degree of influence on the management of an enterprise that is resident in another economy";

2) Portfolio flows, "defined as cross-border transactions and positions involving debt or equity securities, other than those included in direct investment or reserve assets";

3) Other flows, "a residual category that includes positions and transactions other than those included in direct investment, portfolio investment, financial derivatives and employee stock options, and reserve assets", classified in government-related flows and private flows (bank and non-bank flows).

3.2   Volatility modelling and crisis likelihood by the type of flow

It is also important to provide the measurement of the volatility of capital flows with the response to different push and pull factors as well as cyclical and structural ones. Volatility of capital flows will help to further establish the clearer picture of the types of capital flows that are the most volatile, surges of which will likely result in the crisis episode in EMEs. Also, measuring and explaining the volatility of capital flows and its impact on economic growth will help to determine whether global or domestic factors will play a key role for policy makers, considering capital controls on either capital inflows or outflows. The model is adapted from that of Neumann et. al. (2009) and IMF (2007), which uses the standard deviation of capital flows over an ongoing annual period of data:

$$(1) \qquad \sigma_{it} = \left(\frac{1}{n} \sum_{k=t-(n-1)}^{t} (flow_{ik} - \mu)^2 \right)^{\frac{1}{2}},$$

Equation 1. Standard deviation of capital flows over a rolling window (RW).

Source: Broto et. al. (2011)

where, $\mu = 1/n (\Sigma t \ k=t-(n-1))$ of $flow_{ik}$ and $flow_{ik}$ denotes capital flows in country i in period k.

However, considering the drawbacks of the standard deviation, particularly that the volatility is underestimated when the shock period happens and overestimated after such a period, Pagliari and Hannan (2017) use the standard deviations of the residuals obtained from the ARIMA (1,1,0) - AutoRegressive Integrated Moving Average – model.

ARIMA(p,d,q) model as a whole is defined as the more general model of ARMA – Autoregressive Moving Average. ARIMA model general class of models for forecasting a time series which can be made to be "stationary" by differencing (if necessary), perhaps in conjunction with nonlinear transformations such as logging or deflating (if necessary) (Nau, R., 2017).

First, the residuals from the following AR(1) process are estimated:

(2)
$$\Delta flow_{it} = c + \beta \Delta flow_{i(t-1)} + v_{it}$$

Equation 2. ARIMA model: AutoRegressive (AR) moving average process.
Source: Pagliari and Hannan (2017)

Secondly, the test is performed to detect the presence of any ARCH - AutoRegressive Conditional Heteroskedasticity – effects in the residuals. If the null hypothesis of heteroscedasticity is rejected, then the following equation is used:

(3)
$$\sigma_{it}^2 = \frac{1}{4} \sum_{j=t-(n-3)}^{t+(n-2)} \left(v_{ij} \right)^2$$

Equation 3. AutoRegressive Conditional Heteroskedasticity (ARCH) test.
Source: Pagliari and Hannan (2017)

(G)ARCH – (Generalized) AutoRegressive Conditional Heteroskedasticity – models are common tools in applied econometrics for finance to determine 'how much one variable will change in response to a change in some other variable' (Engle, 2001). In other words, the goal of these models is to provide a volatility measure, like standard deviation, that can be applicable to risk management in financial terms.
The estimates for the GARCH model are generally defined as follows:

$$y_{it} = \varepsilon_{it}\sigma_{it}$$

(4)

$$\sigma_{it}^2 = \alpha_0 + \alpha_1 y_{i(t-1)}^2 + \alpha_2 \sigma_{i(t-1)}^2 \ ,$$

Equation 4. GARCH (1,1) estimated standard deviations.

Source: Pagliari and Hannan (2017)

where, $y_{it} \equiv (equivalently\ related)\ \Delta flow_{it}$, in country i and time period t, ε_{it} is a Gaussian white noise process and σ_{it}^2 is the corresponding conditional variance. (Pagliari and Hannan, 2017).

However, due to stated caveats of other similar models (G)ARCH models, such as the data scarcity, which can lead to computational deviations, possible biases in small samples and other specific conditions, in case not met, makes GARCH not suitable, the following conceptual model relies on the standard deviations of residuals obtained from the ARIMA model.

Finally, the model on the actual relationship between short-term capital flows surges and crises is adapted from Ghosh et. al. (2016). The surge episodes of capital flows are defined as the periods of exceptionally large net capital inflows to EMEs (Ghosh et. al., 2016). In their analysis, Ghosh, Ostry and Qureshi (2016) have made an empirical analysis of 53 EMEs globally over the period from 1980 to 2014. Out of 152 surge episodes in the full sample, about 20% of those surges ended in economic crashes, with the most severe episodes happening around 1997 – the Asian financial crisis, 2008 – the global financial crisis, and 2011 – the European and US sovereign debt downgrades followed by the taper tantrum in 2013. According to their research, both domestic and global factors would be relevant for the analysis, with special attention being put on the timing of the variables. Therefore, as the crash endings are defined to occur within the next two years after surge episodes, changes in global conditions are defined as the average in the two post – episode years relative to the average over the episode. At the same time changes in the domestic factors are defined as average values over the surge episode relative to those in the year before the episode began. (Ghosh et. al., 2016). Therefore, the mathematical model to establish a link between capital inflows and financial (i.e., banking or currency) crises takes the following form:

$$(5) \qquad \Pr(Crisis_{jt} = 1) = F\left(\beta k_{jt} + \sum_{m=1}^{n} \gamma_m z_{mjt}\right),$$

Equation 5. Estimation of the crisis episodes during capital flow surges in EMEs.
Source: Ghosh and Qureshi (2016).

where "$Crisis_{jt}$ is is an indicator variable of whether a banking or currency crisis occurs in country j (j and i in previous equations serve for the same country) in period t; k indicates net financial flows (in percent of GDP) prior to the onset of the crisis; and z includes relevant control variables such as (lagged) real GDP growth, fiscal balance, stock of foreign exchange reserves (in percent of GDP), inflation, exchange rate regime, real GDP per capita, as well as country-specific and year effects.1" (Ghosh and Qureshi, 2016).

To summarize, below are the building blocks of a thesis structure in an issue tree form:
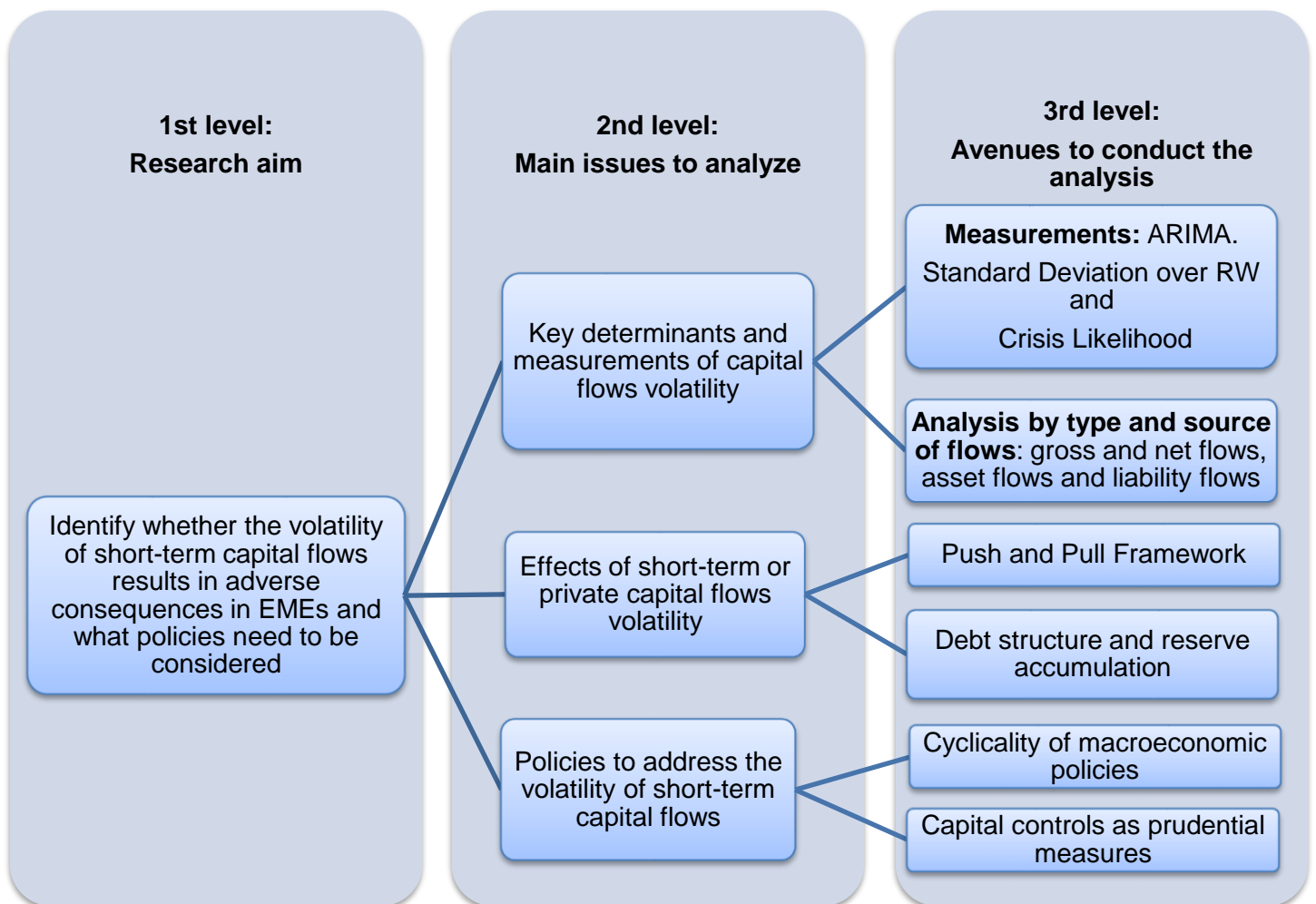
4 Evolution and effects of capital flows volatility over time

International capital flows have grown considerably over the last 3 decades. One of the most recent IMF working papers by Pagliari and Hannan (2017, p.5) has summarized the evolution of capital flows in AEs as well as Emerging Markets and Developing Economies (EMDEs), showing a remarkable rise of cross-border capital flows from 1980s to 2016. Within this period, both, gross and net flows, dropped sharply for AEs and EMDEs in 2008, following GFC, and in 2011, amid the European Sovereign Debt Crisis, as depicted in Figure 4 below:
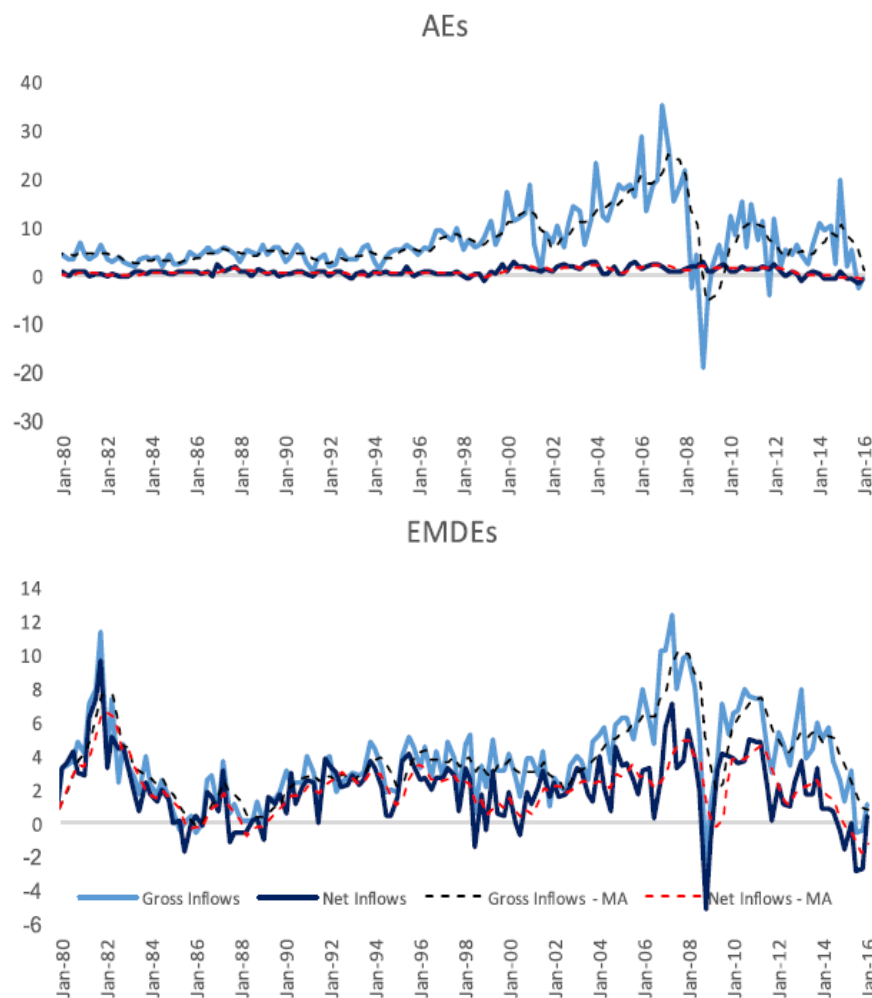

Figure 4. Cross border capital flows in AEs and EMDEs. flows are expressed as % share of group GDP. Dashed lines are quarterly moving averages. Source: Pagliari and Hannan (2017).

One of the key observations here is that the patterns of net flows for EMDEs are mainly characterized by gross inflows since the key driver for capital flows to EMDEs are foreign investments into domestic assets with low amount of domestic investments abroad at the same time. Thus, it is important to distinguish between gross and net flows when measuring volatility of capital flows.

4.1 Analysis by type and source of flows

Using the 3 equations from the conceptual model for volatility measurement – Standard Deviation over RW, ARIMA model as well as ARCH estimated effects on the residuals – Figure 5 below, from Pagliari and Hannan (2017), shows that volatility of total flows, using 3 measures, on average remains similar in its development from the year of 2000 to 2016.
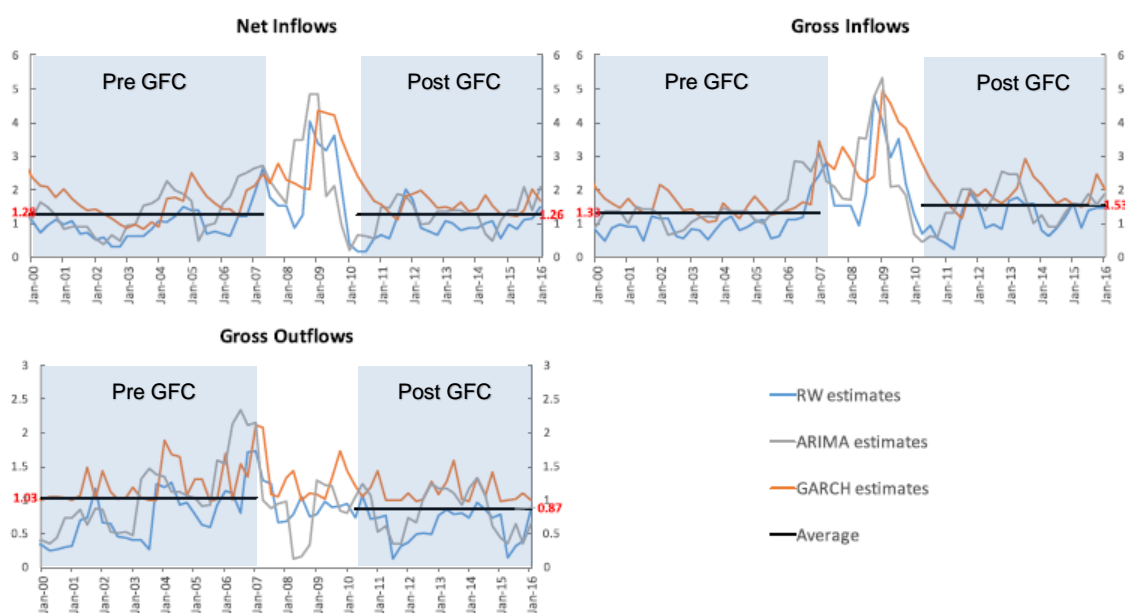

Figure 5. Development of capital flows volatility in EMDEs (total flows). *Note: Measures are expressed as % share of total GDP.* Source: Pagliari and Hannan, 2017.

The main driver for volatility of net flows for EMDEs is the volatility of gross inflows, which outpacing the volatility for gross outflows. Thus, volatility of net flows for EMDEs is on average higher than the those of AEs, where volatility for outflows tend to diminish the volatility of inflows, reducing the volatility of net flows. One of the possible 'red flags' is the fact that the average volatility from 3 measurements for total flows is about the same

now as in the pre GFC estimates, while the volatility of gross inflows is higher now than in the pre GFC environment.

Therefore, it is important to focus on gross inflows for EMEs, as they significantly affect the volatility of capital flows and eventually a crisis estimate for EMEs. Breaking down the results by type of flow, it is evident that short-term flows, such as FPI, bank and other debt flows are more volatile than long-term flows, such as FDI. By conducting a more closer analysis, IMF estimates from Pagliari and Hannan (2017) align with other academic sources in that portfolio debt flows transmit higher levels of volatility than portfolio equity flows. Figure 6 below, which shows the evolution of ARIMA volatility estimates, gives insights into the dynamics of capital flows: it is certain that the primary type of short-term capital flow, which accounts for highest volatility levels, is 'other' flows, followed by portfolio flows, with portfolio debt being more volatile than equity.
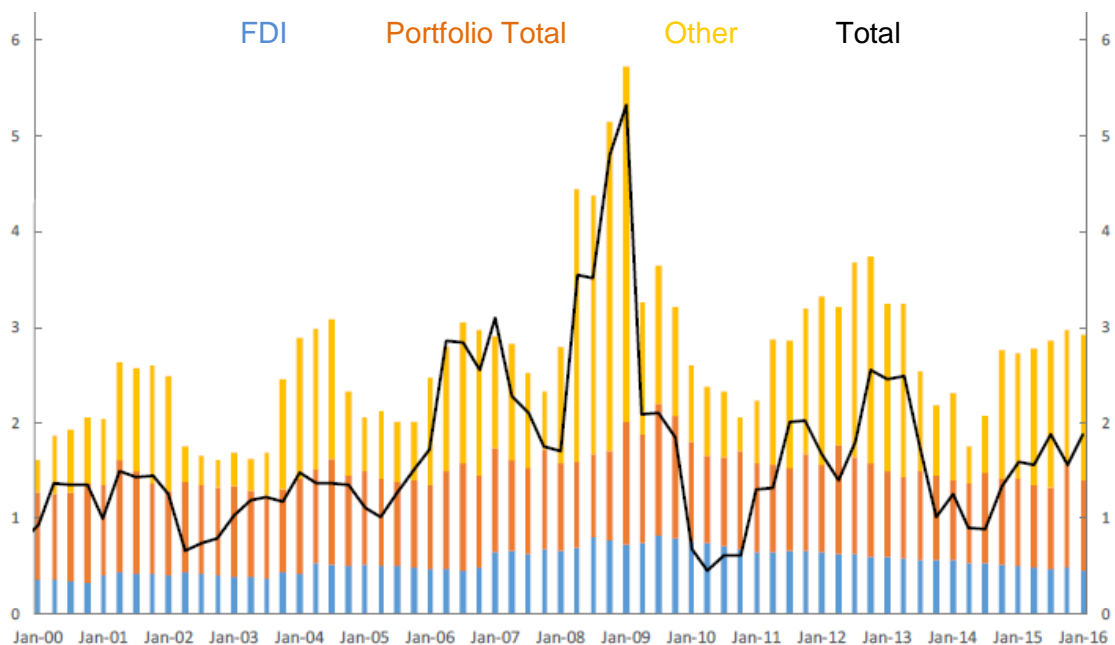

Figure 6. Development of the ARIMA volatility estimates of aggregate gross capital inflows and their components in EMDEs over time. *Note: measures are expressed as % of group GDP.* Source: Pagliari and Hannan (2017).

Given a high relevance of the 'other' capital flows, they need to be more comprehensively analysed. As per Figure 2 in the conceptual model, 'other' investment and debt flows consist of non-portfolio private flows, such as bank flows, and non-portfolio governmental flows, such as trade capital flows and taxes. In other words, they can be grouped into flows to the private sector and flows to the public sector. The former one constitute majority of flows in the composition of 'other' inflows. (Pagliari and Hannan, 2017). The total aggregate inflows from the private sector have considerably diminished and temporary stopped in times of GFC; in the post GFC environment, total private inflows have eventually slowed down, with two reversal episodes with negative growth in 2015 and 2016.

As per the volatility of other flows, it is evident from Figure 7 below that the flows in the private sector are considerably more volatile compared to the official or public sector, which stabilized around 0.8 percentage points. Overall, it can be concluded that volatility of other inflows is mainly driven by private flows, with similar volatility levels for banks and non-banks.

Figure 7. Volatility of 'other' gross capital inflows in EMDEs, broken down by the subtypes. *Notes: measures are expressed as % share of group GDP.* Source: Pagliari and Hannan (2017)

Another important unit of analysis is the source of inflows. In other words, it is the residency of investor, as capital flows could come from the domestic investors or non-resident foreign investors. Although a little systematic empirical evidence is available to determine if the residency of the investor matter compared to macroeconomic fundamentals, recent IMF study shows that the net flows are useful in accessing the macroeconomic imbalances, while the liability and asset flows, summed together as the 'gross' flows, are better in the analysis of financial vulnerabilities. (Ghosh et. al. 2016) The results from the IMF research show that the riskiest form of short-term flows are the debt flows to non-resident investors denominated in foreign currency, the main channel for which is the overvalued real exchange rate regime, as per the macroeconomic imbalances. In addition to the exchange rate regime, economic overheating is another channel for macroeconomic imbalances, through which it results in higher inflation and positive output gaps, indicating an outperforming economy that manages the actual output on a higher volume than country's full-capacity output. The main channel for financial stability risks or vulnerabilities is domestic credit growth. As a result of such credit booms and easily available capital, banks tend to lower lending standards and loan quality, causing swift inflation of asset prices, creating an unsustainable model for growth. Thus, it can be argued that capital inflows are in fact expansionary, meaning that they fuel rapid credit growth and boom-bust cycles (Blanchard et. al., 2015).

4.2 Push and pull framework analysis and crisis likelihood estimations

The empirical results suggest strong correlation between capital inflow surges and financial crises in EMEs in general and in BRIC economies in particular. The highly synchronized nature of capital flow surges and economic crashes suggests that global, or push factors matter in determining the effects of those capital surges, while the diversity of results proposes that the multiplicity of types of capital flows respond to the various macroeconomic fundamentals differently.

The traditional view on capital flows, the neoclassical theory, states that the main drivers of capital flows are the countries' return differentials (Bonizzi, 2013). In the absence of capital controls, the flows would be directed to the countries where resources are scarce. That would enable countries to improve the results of *inter temporal consumption*, which stands for economic theory that explains people's purchase behavior and preferences in terms of consumption and savings. That would in turn provide countries the opportunity

to lend the money abroad in order to fund other lucrative projects or to borrow money at a lower rate than it would have been done domestically in order to finance local investments of EMEs. Therefore, the definition of the current account fits into the traditional neoclassical theory, which states that CA (current account) = Savings (S) – Investments (I) (Bonizzi, 2013). In general, the classical view on capital flows is well summarized by Brunnermeier et. al. (p.6, 2012):

"Capital flows are traditionally viewed as the financial counterpart to savings and investment decisions, in line with the narrative of capital flowing "downhill" from capital rich countries with lower rates of return to capital-poor countries with higher returns. From this perspective, the focus is typically on net capital flows, since that is what counts for funding a country's borrowing requirements." (Brunnermeier et al., p.6., 2012).

However, judging from the financial crises since the 1990's and the current slowdown in capital flows to EMEs that were followed by the high volatility of short-term capital flows, such as portfolio investments and non-portfolio capital flows, e.g. bank flows, the results are less clear-cut for EMEs, and especially for BRIC economies.
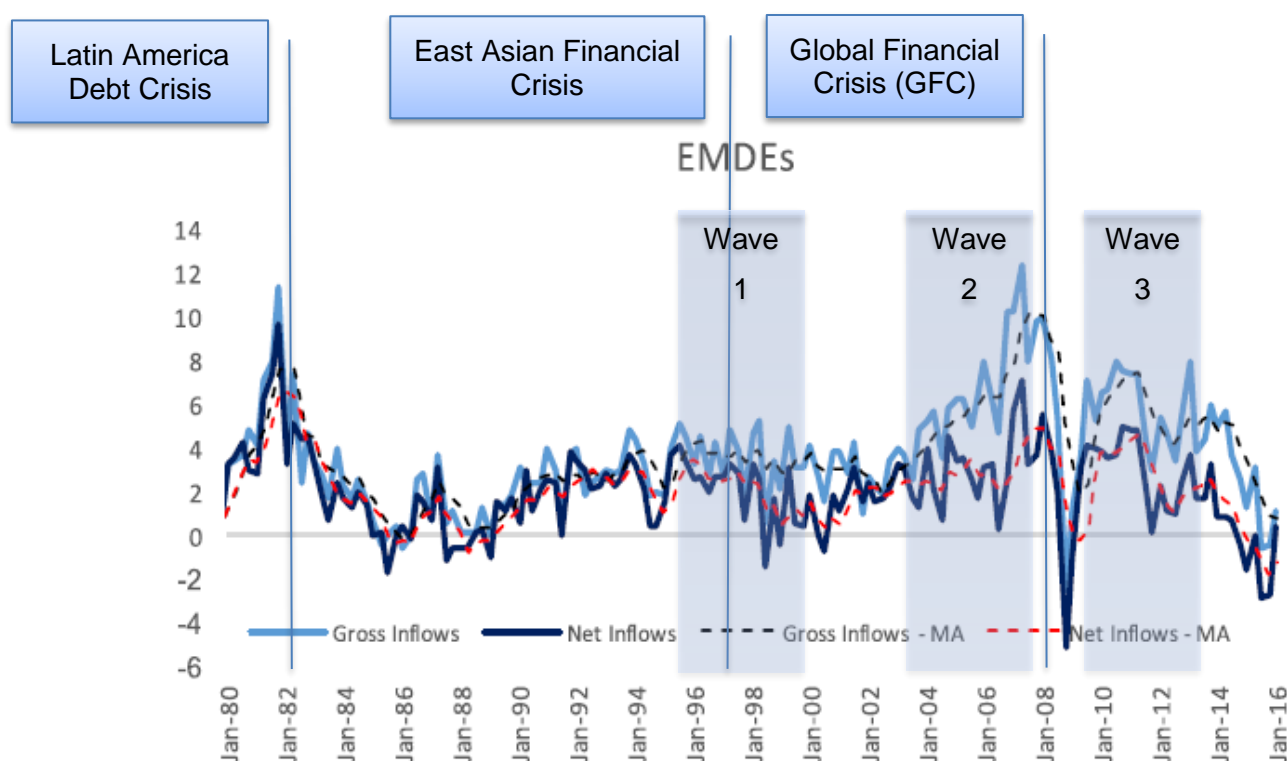

Figure 8. The major waves of net capital inflows and crises in EMEs in (in USD bln). Sources: Pagliari and Hannan, 2017; Moghadam, 2011.

In accordance with Figure 8 above, from 1980s to 2016, EMEs have experienced three major waves of capital inflows that were followed by the crisis episodes. As per IMF estimates, the waves happened around 1990s, 2008 and 2010 – 2012: 1990s were characterized by several severe crises in EMEs, such as the 'Tequila crisis' in Mexico in 1995 and the Asian Financial Crisis in 1997, or the "Asian Contagion", both of which represented the spillover effect from the US interest rate differentials and dependence on the US dollar and were followed by the crisis in Russia in 1998, Brazil in 1999, Argentina in 2001, lastly following the GFC, which started in the US in 2007, resulting in a fatal crash for a global economy. In addition to those 3 waves, one more wave of net capital inflows happened before the Latin America Debt Crisis in 1982, when foreign debt reached its peak and major Latin American countries were not able to repay. The wave of capital flows from 2010 was characterized by the sharp increase of portfolio inflows, also depicted by the Figure 6, both in absolute monetary term and as the percent of GDP. Following those developments, portfolio flows to EMEs have been characterized by high levels of volatility, which is shown by the Figure 6 as well.

Indeed, the above estimates are consistent with the results of the report from International Institute of Finance (2015) – the global association of financial industry – showcasing that portfolio, debt and bank inflows have been negatively affected by the global risk aversion as a global factor, which has gained in importance since the Global Financial Crisis happened in 2007/2008. In addition, the increase of interest rates in the global environment, particularly in the AEs such as those of US, has a significant adverse impact on portfolio and bank inflows, although the results are more controversial for the bank inflows.

In terms of the pull or domestic factors, it is evident that domestic economic performance is an important driver of portfolio flows to EMEs; the banking inflows are mainly driven by the domestic output growth, domestic return and country's risk indicators. (Koepke, 2015). The empirical results for the push and pull factors are summarized in the table below:

Type	Driver	FPI Equity	FPI Debt
Push	Global risk aversion	Significant (statistical) negative relationship (i.e. risk aversion rises → portfolio inflows fall)	Significant (statistical) negative relationship
	AEs (largely US) interest rate differentials	Significant (statistical) negative relationship	Significant (statistical) negative relationship
	AEs output growth	Partial evidence for positively correlated relationship	Partial evidence for positively correlated relationship
Pull	Domestic output growth	Significant (statistical) positive relationship	Significant (statistical) positive relationship
	Asset returns	Partial evidence for positively correlated relationship	Partial evidence for positively correlated relationship
	Domestic Risk indicators	Some evidence for negatively correlated relationship	Some evidence for negatively correlated relationship
Type	Driver	Bank flows	Other flows
Push	Global risk aversion	Significant (statistical) negative relationship	Some evidence for negatively correlated relationship
	AEs (largely US) interest rate differentials	Some evidence for negatively correlated relationship	Some evidence for positively correlated relationship
	AEs output growth	No established relationship	Little evidence for negatively correlated relationship
Pull	Domestic output growth	Significant (statistical) positive relationship	Not enough data / little relevance
	Asset returns	Significant (statistical) positive relationship	Not enough data / little relevance
	Domestic Risk indicators	Significant (statistical) negative relationship	Not enough data / little relevance

Table 2. Key results for Push and Pull factors for analysis of capital flows. Sources: Koepke, 2015; Hannan, 2017.

Taking those factors into account, it is possible to address the first research question of this paper, which is the following: is there a cyclical relationship between short-term capital inflow surges, such as portfolio investment and debt inflows, their volatility and subsequent economic disturbance in EMEs? According to Ghosh et. al. (2016), it is necessary to first account for the changes in the global factors and their impact on the possibility for the crisis episode for in EMEs. The results of the empirical analysis are presented in the Table 3 below:

Crisis type	Banking				Currency			
Columns	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Asset flows/GDP	0.050	0.026			0.067	0.114		
	(0.018)	(0.023)			(0.037)	(0.064)		
Liability flows/GDP	0.046	0.025			0.041	0.045		
	(0.017)	(0.023)			(0.019)	(0.026)		
Net FDI flows/GDP			−0.069	−0.150			0.007	−0.083
			(0.053)	(0.076)			(0.048)	(0.067)
Net portfolio flows/GDP			0.041	−0.011			0.052	0.020
			(0.022)	(0.026)			(0.032)	(0.029)
Net other inv. flows/GDP			0.070	0.051			0.046	0.104
			(0.023)	(0.025)			(0.023)	(0.047)
Real effective exchange rate (REER)		0.024		0.024		0.060		0.063
		(0.011)		(0.012)		(0.012)		(0.013)
Reserves/GDP	−0.047	−0.030	−0.041	−0.023	−0.112	−0.095	−0.112	−0.091
	(0.018)	(0.026)	(0.018)	(0.027)	(0.042)	(0.050)	(0.043)	(0.049)
Real GDP growth	−0.009	−0.025	−0.005	−0.017	0.018	0.071	0.016	0.082
	(0.022)	(0.034)	(0.024)	(0.034)	(0.025)	(0.029)	(0.024)	(0.027)

Table 3. Crisis probability by type of flow. Source: Ghosh and Qureshi, 2016.

According to the statistical results of the Equation 5 from conceptual model, that assess the crisis likelihood in EMEs, results of which are summarized in the table 3 above, changes in AEs interest rates differentials, that of US in this case, investor risk aversion and commodity prices, e.g. the oil prices, are highly synchronized with the subsequent economic crashes that occur after a high volume of short-term capital inflows. For instance, the probability of the crisis episode increase by 6 percentage points in case of the US interest rate hike of 100 basis points against to no change in the level of the

interest rate for the short-term lending. At the same time, when the global risk aversion increases twofold, the probability of the crisis increases by 2 percentage points. Furthermore, the effects on asset flows and liability flows are broadly similar on the crisis likelihood: e.g. a 10% GDP surge in capital inflows from either residents or non-residents, increases the probability of banking or currency crisis by 2 ppt. (Ghosh et. al. 2016). In order to visually demonstrate key results for push and pull as well as structural and cyclical factors, Figure 9 below shows the coefficient of some of the key drivers from Table 2, multiplied by the average value of the independent variable (Hannan, 2017)
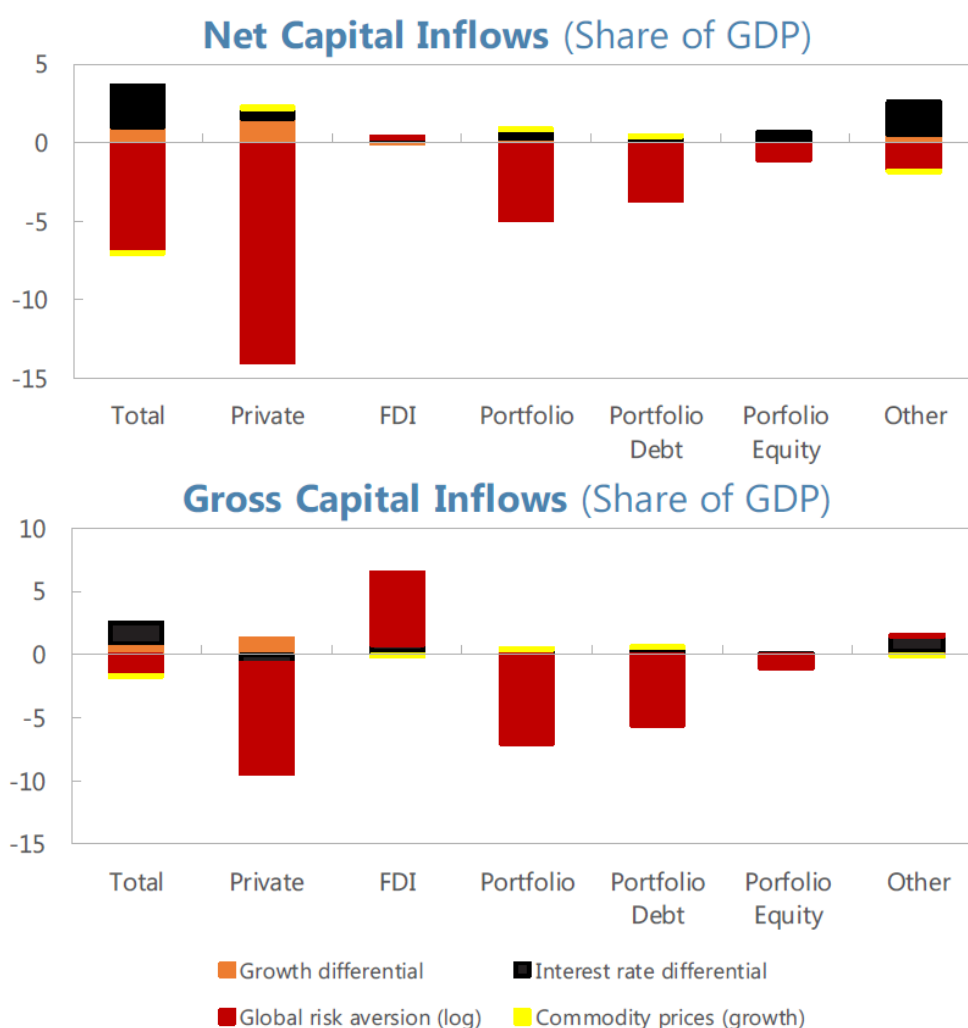
Figure 9. Net and Gross Inflows across various instruments as a percent of GDP. Source: Hannan, 2017.

Therefore, it is possible to conclude that there is a rising frequency of capital inflow surges and subsequent economic crashes in EMEs. Particularly, it is evident that certain types of flows, such as portfolio and other debt inflows are more likely to be associated

with the crisis episodes. Considering the importance of the global factors and the fact that they are driven by foreign investors, it is important to address the issue of capital controls and other prudential measures, analyzed in more detail in Chapter 5.

4.3   Reserve accumulation, debt composition and dynamics of capital flows in EMEs

One of the key distinction of EMEs is the atypical composition of their debt, which is one of the reasons being prone to financial crisis. The key change since the financial crises of 1990s is that EMEs have enormously developed their domestic debt compositions (Mehl and Reynaud, 2005). In total, net government debt increased from $1.3 trillion in 2000 to $6.3 trillion in 2013, which accounts for almost half of the size of the US Treasury markets, the world biggest and most liquid market (Klingebiel, 2014). Figure 10 below demonstrates the explosive growth in emerging markets (EM) local currency, i.e. domestic (DX) debt. Well-developed EM DX debt markets in local currency can function as a hedge against capital flows volatility, foreign exchange movements and be an internal source of financing in the case of insufficiency of external funding. Thus, it means that EMEs could secure themselves from the risk of volatile exchange rates and risk of foreign-currency (FX) denominated debt.
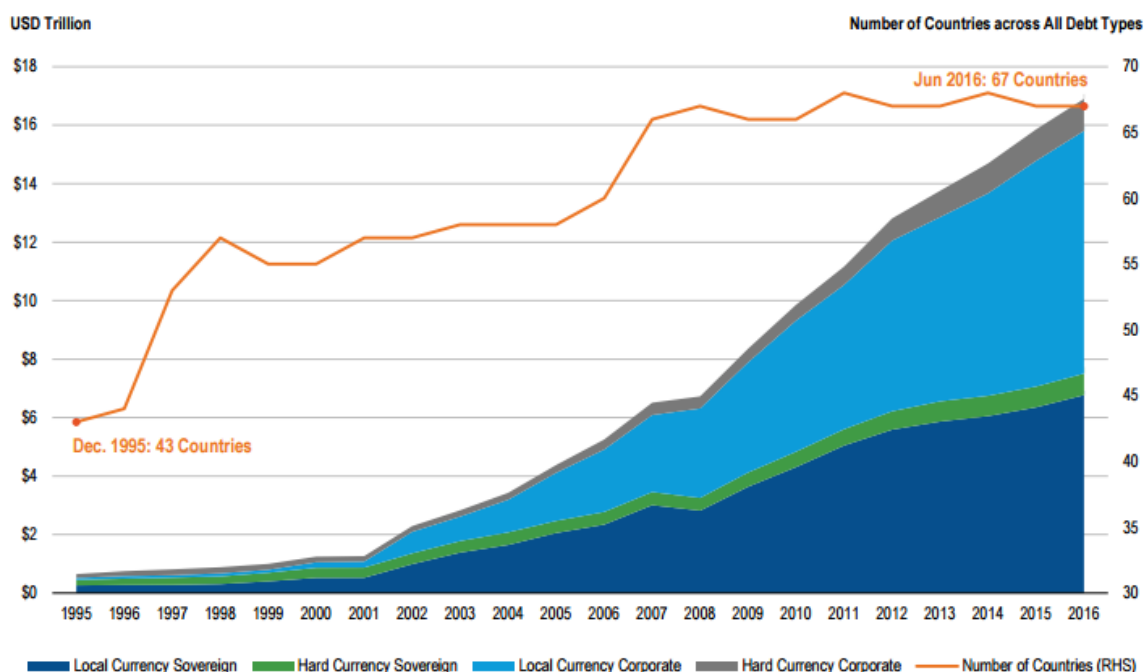

Figure 10. Rapid growth of EM DX debt. Source: Franklin Templeton Investments, 2017

Transformation of EM debt market generally helped EMEs to turn away from the problem of accumulating FX debt – the problem that is also known as 'original sin' problem of borrowing in non-domestic currency. Hausmann and Eichengreen introduced the term called 'original sin' in 1999, to describe a situation in which "*the domestic currency is not used to borrow abroad or to borrow long-term even domestically"* (Eichengreen and Hausmann, 1999). Thus, the reasons for presence of 'original sin' are mainly: a) government may need to raise foreign currency financing to strengthen its international reserves b) it can be forced to consider foreign currency borrowing only, due to its inability to issue local currency debt on the local market or on the international market (Hausmann and Panizza, 2010).

According to Duggar, E. and Oosterveld, B. (2015) from Moody's, there was a steady annual growth of 14.4% on average of local currency sovereign debt outstanding from 2000 to 2014 (Duggar and Oosterveld, 2015). Thus, local currency debt rose from about 55% in 2000 to almost 80% of the total debt in 2013, (Klingebiel, 2014). Figure 11 below shows the distribution of DX and FX – also referred to as hard – currency debt by region. It demonstrates that East Asian EMEs are the biggest holders of local currency debt, while Sub-Sahara African countries are biggest EMEs who rely on hard currency debt.
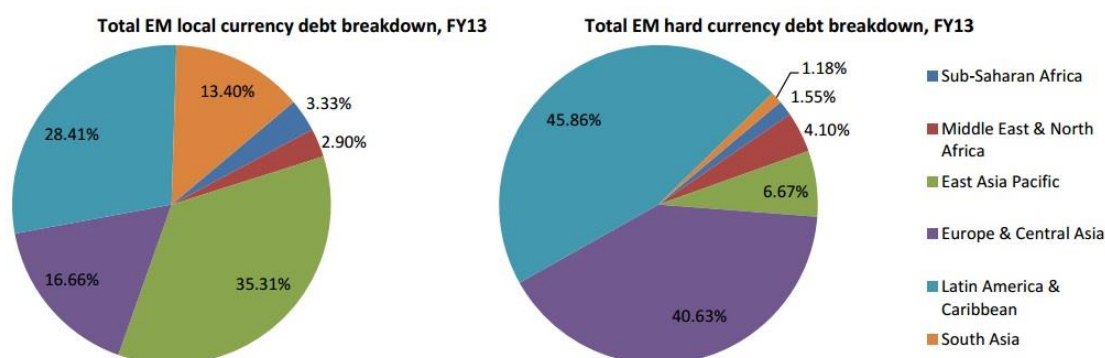

Figure 11. Total EM DX and FX debt breakdown Source: Klingebiel, 2014.

However, foreign investors have been tapping into developed local currency bond markets in EMs, avoiding near-zero interest rates in developed countries. This means that there is the risk of significant capital outflows in EMEs in case of rising interest rates in AEs, which was the case in the recent developments of the world economy. Indeed, in 2014 IMF issued a report where it was indicated that as foreign investors participate more in EM debt markets, they create the "demand-side" risk of capital outflows, which,

for instance, happened in May 2013, after Bernanke, Fed chair at that time, made re-
marks on tapering of asset purchases – the so called "Taper Tantrum". The scale of
foreign holding of EM debt is of a decent size: about half a trillion dollars of overseas
investment went into EM government debt during 2010–12, mainly from foreign asset
managers. Among other trends of foreign participation are: (a) Foreign participation in
EM government debt markets has been increasing, however not quite to the level of AEs,
probably due to the fact that foreign central banks are not yet a primary investor class
for EMs, (b) Foreign holdings of EM sovereign debt have risen in tandem with the im-
proved credit ratings of EMs (Ebeke and Lu, 2014).

Based on the facts and trends showcased above, it is evident that while foreign partici-
pation can bring credibility to EMEs, foreign holding in FX denominated debt has also
been on the rise: the findings from Bloomberg and Societe Generale (2016) demonstrate
that FX debt has risen by $ 1.1 trillion USD from 2008 to 2015, totaling almost $ 3.4
trillion USD, as per Figure 12. The risks associated with this type of debt are vulnerabil-
ities and financial stability risks in capital flows, with high risk of sharp
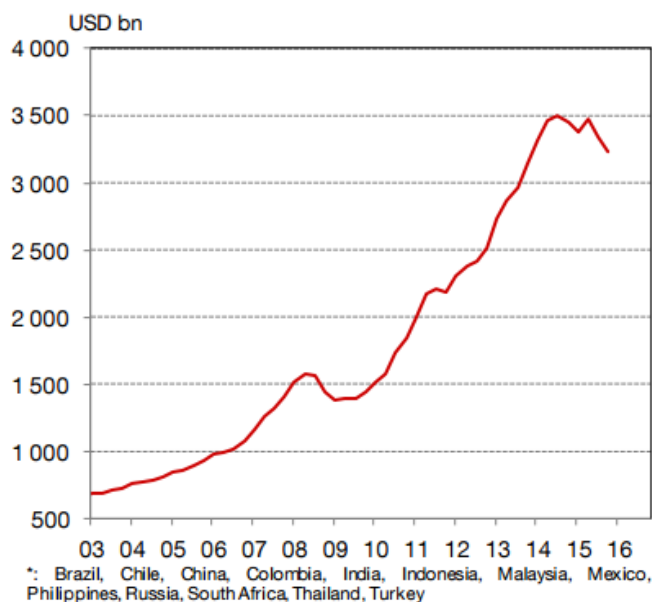

Figure 12. Rapid growth of FX denominated debt. Source: Societe Generale EcoNote,
Diaz Mendoza, 2016.

capital outflows, driven by interest rate differentials in AEs and resulting in currency mis-
matches. Indeed, in case of low interest rates in AEs, there is an increase in capital
inflows to EMEs from foreign investors, i.e. liability flows, due to higher yields in EMEs.

As a result of pressure on domestic currency in EMEs, it appreciates, while borrowing costs decrease, creating a tendency to accumulate FX denominated debt.

In the end, it generally leads to macroeconomic imbalances and financial stability risks, with the most severe episodes happened in Latin America in 1982, Argentina in 2001, 'Tequila Crisis' in Mexico and Asian Financial Crisis in 1997, followed by the crisis in Russia in 1998.

4.4 Key results for individual countries and BRIC economies

BRIC economies have experienced severe financial crises and spillover effects from AEs in 1990s, during GFC in 2008 and in the recent times, e.g. during the 'Taper Tantrum' in 2013. Furthermore, many crisis episodes were followed by the surge in foreign capital. Reconciling with the empirical results presented in the table 4, this behavior puts forward the assumption of the cyclical nature of short-term capital flows and crises episodes in EMEs. Figure 13 below from Ghosh et. al. (2016) demonstrates the surge episodes of short-term capital flows that have ended in crises in selected 53 EMEs, including BRIC economies:
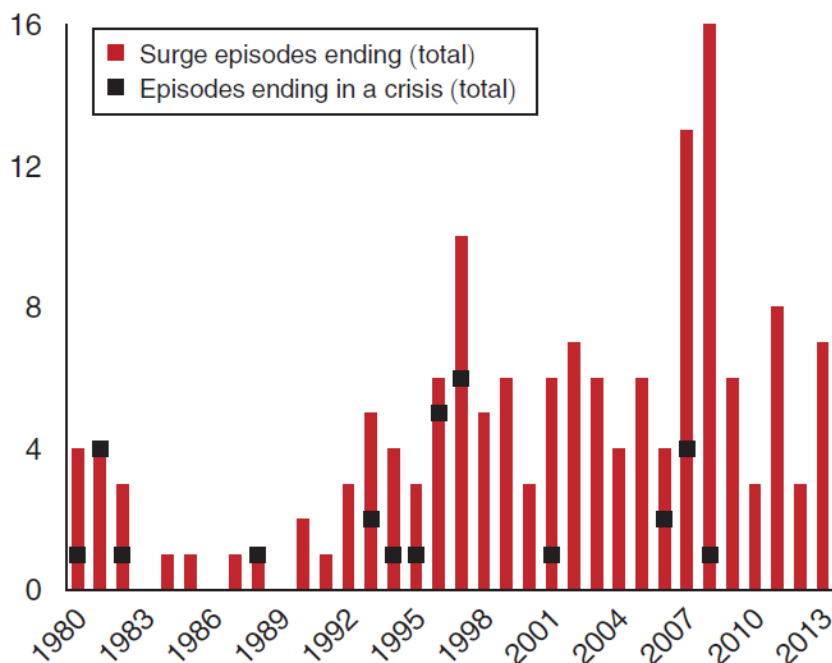

Figure 13. Surges of capital flows and crises in EMEs. Source: Ghosh et.a., 2016

Portfolio Debt

Portfolio Equity

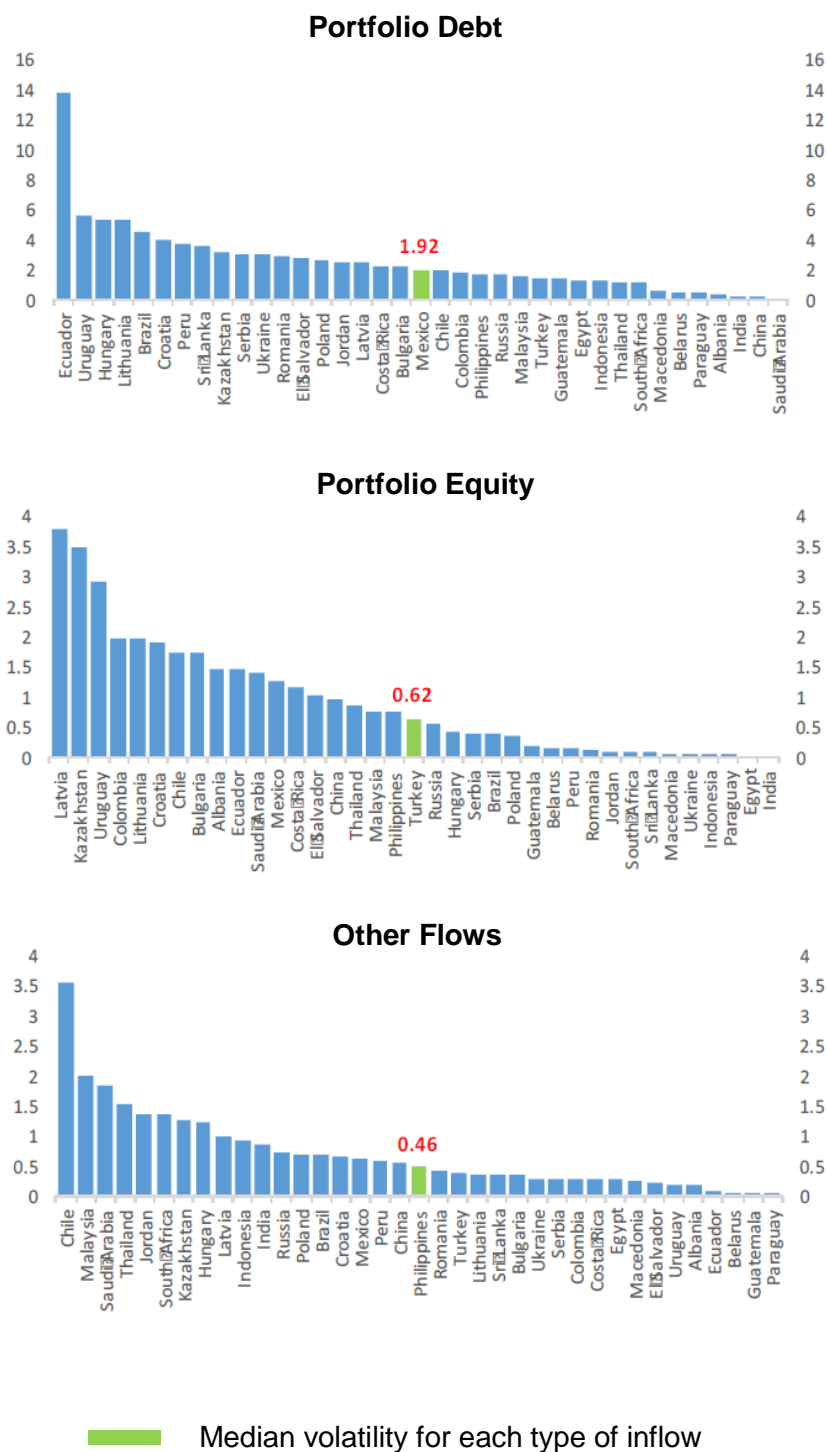**Other Flows**

Median volatility for each type of inflow

Figure 14. Medians of ARIMA volatility estimates for gross inflows by type of flow and for individual countries. Note: measures are expressed as a percent of GDP; in addition, time series are not available in public domain.

Source: Pagliari and Hannan, 2017

While not all capital flows resulted in financial crisis in EMEs prior to GFC, some countries were affected more than others during the taper talk of 2013: economies of India, South Africa, Turkey, Brazil and Indonesia have experienced up to almost 30% cumulative negative change in their nominal effective exchange rate (Ostry et. al., 2016). It is equally important to not only consider the volatility of capital flows as an aggregate measure but also as a measure across individual countries in order to better understand what policies are needed to tackle high volatility levels and which types of flows need more attention than others.

Figure 14 on the left represents the ARIMA volatility estimates for individual countries for portfolio debt and equity gross inflows as well as other flows, including bank inflows. Key observations for the BRIC economies plus South Africa include the following: in the portfolio debt gross inflows, Russia, South Africa and China experienced volatility of less than median average of 37 EMEs represented, with China being less volatile of all countries, except Saudi Arabia, which probably suggests a lower volume of portfolio debt inflows for this time series. Other BRICs have been more volatile in portfolio debt inflows, with Brazil being the most volatile among BRIC

economies. Almost the opposite takes place within the portfolio equity flows, while all BRICs plus South Africa experienced higher than median volatility for other flows.

The overall results for median volatility for individual countries are in line with previous analysis for the aggregate measurements, with portfolio debt being more volatile than equity as well as banks flows being the main driver of volatility for other flows.

Amid the recent developments for EMEs, China has been a front runner in opening its economy to foreign investors and further advancements in financial liberalization. Since the slowdown of Chinese economy, Chinese president Xi Jinping highlighted, during the latest World Economic Forum meeting in Davos, that China will open its market access to foreign investors, thereby reducing the pressure on its domestic currency – renminbi (RMB). In other words, China is on the path to attract higher volume of liability flows from non-resident, foreign investors and accumulate funds – FX denominated capital. As per the previous analysis of this paper, the above-mentioned capital inflows proved to be more volatile, meaning that China should be cautious in opening its economy to foreign investors. Thus, Chinese authorities should consider a more gradual approach, following a strong domestic financial regulation. Indeed, during the 1990s, China has undertaken a gradual approach towards liberalization and avoided severe consequences and contagion of the financial crises in EMEs that started with the East Asian financial crisis of 1997, following the crisis in Russia in 1998. However, China faces more capital outflows, particularly in terms of other flows, where the volatility is driven by banking inflows, despite the rebound in the Foreign Exchange (FX) reserves (Johnson, 2016).

According to the article in Financial Times, Wildau (2016) indicates that People's Bank of China's (PBoC) attempt to use FX reserves to stabilize the renminbi exchange rate has generally succeeded in beating speculators, however, amid the delay in Fed tightening of monetary policy, China is expected to suffer capital outflows. As the PBoC was intended to reduce the capital controls and let the market forces to set the exchange rate, this approach has faded away to restore some stability. On the contrary, PBoC has promised to introduce the capital controls, such as 'restricting the FX purchases by individuals and halting a program to allow Chinese residents to invest in foreign hedge funds' (Wildau, 2016)

5   Policy Implications

In contrast to AEs, where macroeconomic policies tend to be countercyclical, procyclical policies have been a problem for EMEs because of the absence of financial depth in most countries, resulting in poor management of capital flows volatility and the causes of 'original sin' problem i.e. accumulating FX denominated debt. Procyclicality of e.g. fiscal policy refers to the case when government spending rises and taxes decrease during an economic boom and the opposite happens in economic downturn and recession, while countercyclical fiscal policy is the opposite of pro-cyclical. More than a decade ago, Kaminsky et. al. (2004) has identified that capital inflows, fiscal policy and monetary policy tend to be procyclical for the most developing countries and EMEs. Among others, Coulibaly (2013) finds the "gradual" development of countercyclicality in EMEs policies few years after GFC, which he accounts for macroeconomic fundamentals, reforms in financial sectors and other developments e.g. the Inflation Targeting (IT). Below is the analysis of the policy question, tackling the volatility of capital inflows and countercyclical macroeconomic policies in EMEs.

5.1   Analysis of monetary policy cyclicality: counter- and pro-cyclical monetary policies

There was a shift in the behavior of macroeconomic policies among EMEs and AEs. Following the recent developments, EMEs and AEs monetary policy has become more countercyclical over the past decade. Although the improvements are not as uniformed as in AEs, some EMEs, such as Mexico, Malaysia, the Philippines and Colombia are becoming more countercyclical in nature. Figure 14 and 15 below represent EMEs and AEs shifts in the policy approach.
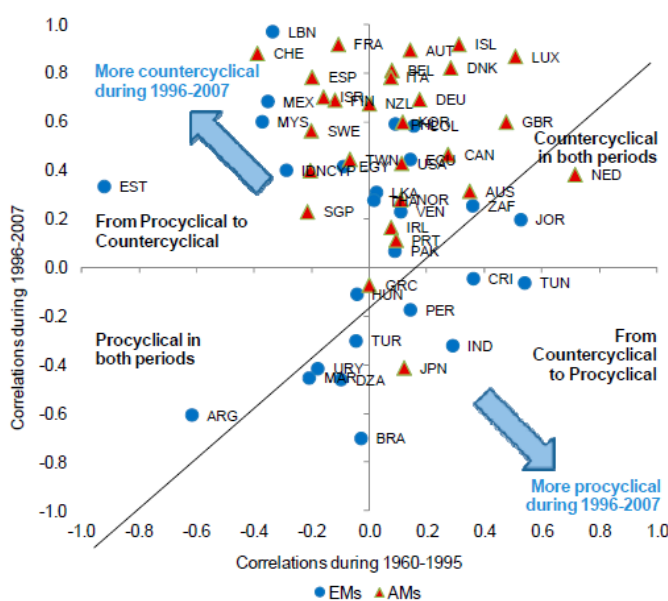
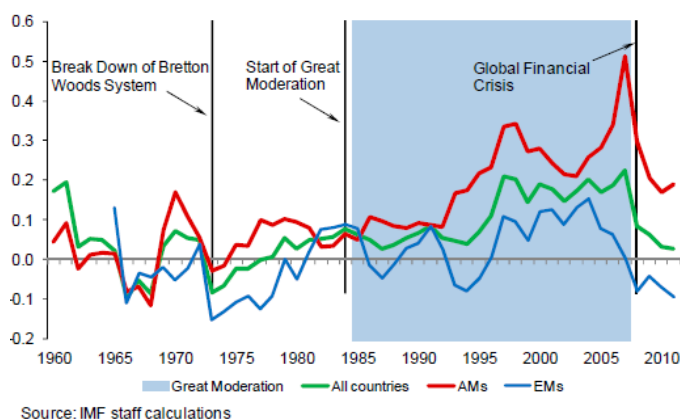Figure 15. Transitions. Source: McGettigan et.al, 2013.

Indeed, more and more EMEs (about 60%) tend to be countercyclical in the past fifty years, which is the top left and right quadrants and especially during 1996-2007 period, following the AEs in the same direction. Figure 15 below demonstrates the counter cyclicality of monetary policy over time, from 1960 to 2011. Positive correlation relates to countercyclical monetary policies while negative figure indicates procyclicality of monetary policy.

Figure 16. Cyclicality of Monetary Policy over Time. Source: McGettigan et.al, 2013.

For AEs, the turning point in time was the breakdown of Bretton Woods System of gold standard; since then policies became countercyclical in nature. For EMEs, it has been quite volatile due to the dependence on commodity price baskets and its volatility over time. (McGettigan et.al, 2013).

The key drivers for monetary policy cyclicality for EMs are: (1) Inflation Targeting (IT): according to IMF findings, implementation of an IT regime improves the correlation between real interest rates and output by almost 0.6-0.7. That is quite unexpected 1.3–1.5 standard deviation improvement. Thus, inflation targeting, and everything which it usually involves, should help significantly improve effectiveness of monetary policy and stabilize the economy; (2) deep financial systems: IMF results indicate that only in countries with moderate financial depth and sufficiently developed financial markets with flexible exchange rate regimes stop

reacting to capital flows with procyclical manner. That could be attributed to "fear of floating" in countries with less developed financial markets.

To summarize, the IMF input in the analysis of countercyclical policies in EMs revealed that EMEs have been experiencing countercyclical monetary policies over time along with AMs but not quite to AMs levels; inflation targeting, better institutions and developed financial markets in general are the key drivers behind monetary policy counter cyclicality; as a result more often conducted countercyclical policies bring significant economic benefits and reduce output volatility (McGettigan et.al, 2013).

5.2   Capital controls as prudential measures

Accounting for promising countercyclicality, the current environment around EMEs, with strong dollar, low commodity prices, particularly oil, credit booms and large FX denominated debt reminds of the previous pre-crisis episodes and is still a concern for macroeconomic imbalances and financial stability risks in EMEs, in times of surges of short-term capital flows followed by consequent financial crises. However, in the past decade, important changes took place, namely the development of domestic debt compositions and local currency bond markets of EMEs; following those developments, the increase in foreign participation in EM local currency bonds; nevertheless, presence of above-average volatility of portfolio debt and banking inflows as well as FX denominated debt, namely 'original sin' problem, are presumptuous in a few countries. From this perspective, there is a great deal of uncertainty in EMEs in terms of policy implications. As was presented above, before 1990 the policies tend to be procyclical, however after EMEs got more credibly adopting IT policies and free floating exchange rates, they have realized that there is a greater scope for EMs in conducting further policies, regulating capital flows, such as capital controls.

As the result of the discussion and analysis presented above, the issue of capital controls and regulation is becoming a key issue for policy makers and a hot topic for debates in academia in terms of macroeconomic research. Researchers from IMF – Ghosh, Qureshi and Sugawara (2014) – have proposed the regulation of capital controls at both ends, not only within the recipient country but also at the source country. This idea was originally proposed by John Maynard Keynes and Harry Dexter White, the architects of the Bretton Woods, when discussing the post-war international monetary system (Ghosh et.

al. 2014). Taking into account 31 major source and 76 recipient countries – both EMEs and AEs – Ghosh et. al. (2014) have found that various types of controls and prudential measures at both ends could largely influence the volume of cross-border banking flows, for instance, within the source country, the controls on bond, equity, FDI and financial credit outflows result in smaller flows. In case of recipient end, controls on bond inflows and FX prudential measures are associated with significantly smaller inflows as well (Ghosh et. al. 2014).

However, other researchers are cautious in terms of capital controls implementation. Pasricha (2015) indicates that there is little evidence regarding the effectiveness of capital controls in achieving the desired policy outcomes. The outward investment flows from EMEs have important policy implications in terms of capital controls. In case the capital control measures had impacted the volume of net inflows, exchange rate or monetary policy, the effect was not significant. However, the changes in capital controls do seem to influence the composition of capital inflows: the results suggest that EMEs were able to reduce gross inflows of resident borrowing of foreign banks by tightening capital inflows (Pasricha, 2015).

Therefore, it is evident that the effectiveness of controls is not certain and thus remain open to debate among the researchers. According to IMF recent paper by Ghosh and Qureshi (2016) – *What's In a Name? That Which We Call Capital Controls* – it is important to distinguish between controls on capital inflows and controls on capital outflows. The controls on inflows have been historically associated with advanced and more liberalized economies as they have used those as prudential measures as a short-term tool against speculative inflows in the post-war and Bretton woods area as well as afterwards. On the contrary, controls on outflows were and are correlated with more autocratic regimes (Ghosh and Qureshi, 2016).

Most of the criticism toward inflow controls can be well applied to control on outflows. While it is argued that controls on inflows are persistent and ubiquitous, controls on outflows are often pervasive in nature too, being broad-based, heavy-handed and only gradually removed as domestic economy stabilizes. The controls on inflows are more ad – hoc in nature, for example taxes on certain types of flows, and usually are removed once the tide turns as was evident from the experiences of Brazil, Chile, Columbia and Peru. (Ghosh and Qureshi, 2016).

Although inflow controls are considered to be ineffective, their use has proved to influence the general composition of flows to less risky and longer-maturity flows that makes them the tools of prudential measures.

In the last three decades, the word "controls" has received a negative connotation among researchers and policy makers who have been the advocates of financial liberalization as IMF. Nevertheless, in the recent paradigm change in the IMF thinking and increasing episodes of surges of short-term capital flows and subsequent financial crises in EMEs, capital controls have been back in fashion. However, the capital controls, in particular the controls on inflows, were substituted by the term *prudential* or *macroprudential measures* such as certain currency-based measures: reserve requirements and restrictions on local lending in foreign exchange. Such policies became broad-based ever since the East Asian financial crisis of 1997 and they tend to be pro-cyclical with the capital flow cycle in EMEs (Ghosh and Qureshi, 2016).

6   Conclusions

As EMEs were becoming more integrated in the world economy, they have a prolonged path towards the financial liberalization. Neo-liberalism agenda has been on the front page among policy makers in both EMEs and AEs for the past three decades. Therefore, EMEs have experienced a trend toward the capital account liberalization and openness to foreign capital. However, being exposed not only to long-term flows such as FDI, but also to more short-term flows such as debt and equity foreign portfolio and bank inflows, EMEs started experiencing macroeconomic imbalances and financial stability risks due to high volatility of short-term capital flows. The relationship between the surge episodes of short-term capital flows and subsequent economic disturbance and/or financial crises in EMEs has proven to be synchronized on the aggregate level.

The key findings of the thesis paper can be summarized as follows:

(1) There is a evident relationship between the surge episodes of short-term capital inflows and financial crises and macroeconomic imbalances that lead to financial vulnerabilities and sometimes financial crises. Portfolio debt and other investment flows, driven by bank inflows, are considered to be more volatile in nature and do not provide risk-sharing or other benefits to the recipient country as opposed to more long term flows, such as FDI, which do seem to boost economic growth and provide EMEs with human capital and technological know-how.

(2) The following suggests some important policy implications, such as capital controls or prudential measures. In general, liberalization of capital flows can benefit both source and recipient country if they meet certain thresholds: those can be the general quality of institutions, general financial stability and financial depth as well as volume of DX denominated reserves and low level of FX denominated national and/or corporate debt. Without those thresholds, EMEs have experienced severe macroeconomic disturbances and high volatility of large capital inflows, especially for portfolio investments, banking flows and other non-portfolio debt flows. In general, this thesis emphasizes that capital controls should be considered even at both ends, not only for recipient country but also for the source country as well as controls on both inflows and outflows, depending on the global and domestic factors of individual countries.

7 References

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