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RESEARCH ARTICLE

SUSTAINED CAPITAL FLOWS TO EMERGING MARKET ECONOMIES

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Abstract

A recurrent pattern in international economics is abundant global liquidity and capital flows, followed by monetary policy tightening and capital outflows from emerging markets (EMs). This pattern often results in exchange rate instability, balance of payment problems, and financial turbulences in EMs. This study aims to identify the determinants of sustained capital flows to EMs. To this end, episodes of sustained capital flows above a threshold value are used as binary variables in constructing a complementary logarithmic framework. The results indicate that to preserve capital inflows, EMs should maintain stable and positive gross domestic product (GDP) growth, restrain exchange rate volatility, and hold interest rates low. External factors, such as GDP growth and interest rates in developed countries, also affect capital flows to EMs. While EMs cannot affect external variables, maintaining a sound macroeconomic environment at home would insulate them from the financial turbulences generated by global factors.

Keywords: Capital flows, financial stability, emerging markets
JEL codes: F21, F32, G01

1. Introduction

During the past few decades, the world economy has witnessed the increasing role of international capital flows in countries' economic growth and macroeconomic stability. Particularly in emerging markets (EMs), foreign capital opens the way for growth and development through financing new investments, raising productive capacity, and creating new employment opportunities. The role of foreign capital in China's economic success is a case in point. Since China announced its reform and opening policy in 1978, foreign capital has been a significant source of economic growth. In addition to stimulating economic development, foreign capital allowed China to accumulate substantial current account surpluses and foreign reserve holdings (Sui, 2019).

Nevertheless, unstable capital inflows or sudden capital outflows may generate exchange rate and balance of payment problems in EMs. The currency crises in Mexico in 1994, the Asian

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financial crises in 1997, and the Russian ruble crisis in 1998 are remarkable economic downturns associated with capital flow fluctuations. Likewise, the reversed extreme liquidity period, following the recovery of advanced economies (AEs) from the 2008 Global Financial Crisis (GFC), diverted interests toward risks associated with international capital flows in EMs. Also, recently, to mitigate the tightening effects of the COVID-19 pandemic on financial markets and economic activities, many central banks undertook expansionary monetary policy measures and provided substantial liquidity to the markets. However, as inflation rates surged after the pandemic, monetary policy stances were reversed, and central banks started increasing policy interest rates. Subsequent international liquidity shortages and higher interest rates in the major AEs, particularly in the United States (US), resulted in capital outflows from EMs.

Hence, abundant international liquidity and capital flows, followed by monetary policy tightening and capital outflows from EMs, is a recurrent pattern. Because this pattern evokes credit constraints, higher funding costs, and exchange rate fluctuations, it makes EMs more prone to financial risks and prevents their sustainable growth prospects. In this regard, investigating the impact of foreign capital inflows on the economic growth of East Asian countries, Baharumshah and Thanoon (2006) find that short-term capital inflow hurts the countries' short-term and long-term growth prospects. Accordingly, especially in the aftermath of the GFC, EMs have tried to mitigate capital flow fluctuations by implementing some capital flow management measures. Nevertheless, the effectiveness of such measures is limited in attaining their goals (Norring, 2022). Furthermore, Blundell-Wignall and Roulet (2014) find that increased capital controls after 2008 negatively affected business investments.

Against this background, this study asserts that EMs benefit more from capital inflows if sustained above a certain level, are relatively less volatile, and last for a considerable time. Also, given the ineffectiveness of capital control measures, policymakers should identify and observe the determinants of sustained capital inflows to EMs. Hence, different from the existing studies that analyze the determinants of capital flows (e.g., Calvo et al. 1993; Chuhan et al. 1998; Kim 2000; Baek 2006; Cerutti et al. 2019), extreme episodes of capital flows (e.g., Forbes and Warnock 2012; Calderon and Kubota 2013; Hlaing and Kakinaka 2019), and the effects of policies on capital flows (e.g., Nugent 2019; Frost et al. 2020), this study focuses on identifying and analyzing capital inflows to EMs that is above a certain level and maintained at this level for a specified period.

To this end, episodes of capital flows that last at least three consecutive quarters of a year above a threshold are identified, and this data is transformed into binary variables. Then, utilizing the complementary logarithmic framework, determinants of sustained capital flows are estimated. Our main results indicate that several EM characteristics and some global factors affect sustained capital inflow episodes. For instance, maintaining high GDP growth rates, low interest rates, and low risk factors would increase the likelihood of sustained capital inflow episodes. While EMs would not have any considerable effect on global factors, such as the world GDP and the world interest rates, maintaining a sound macroeconomic environment at home would also insulate EMs from the financial turbulences generated by fluctuations in external variables.

The paper proceeds as follows. The following section presents the literature review on capital flow dynamics. Section 2 explains the capital flow data and defines the methodology for generating sustained capital inflow episodes. Section 3 presents and discusses empirical results. The last section concludes.

2. Literature Review

Along with the globalization waves and the emergence of persistent current account imbalances, the 1980s witnessed increasing international capital flows among industrial countries (Turner, 1991). The rise in capital flows to emerging and developing countries started in the 1990s (Calvo et al., 1996). However, capital flows to these countries were interrupted by the currency crisis in Mexico in 1994 and again by the Asian financial crisis in 1997.

To explain the capital flows to EMs in the 1990s, economists debate the relative importance of the attractiveness of domestic conditions in EMs (i.e., the pull factors), such as their stronger economic performances, and the unfavorable conditions in AEs (i.e., the push factors), such as the cyclical movements in world interest rates. In a seminal paper, Calvo et al. (1993) investigate the characteristics of capital flows to Latin American countries. The authors use foreign exchange reserves as a proxy for capital flows based on the idea that capital inflows boost foreign exchange reserves. They find that primarily external factors, like recessions and the low interest rates in the US, are the most crucial determinants that push capital into Latin American countries. In addition to its determinants, the authors also point out that capital outflows would make Latin American countries more prone to economic crises. Accordingly, Calvo et al. (1993) propose some policy recommendations, such as taxing short-term capital borrowing from abroad, while they also recognize the limited effects of such interventionist policies.

Chuhan et al. (1998) criticize the proxy choice of Calvo et al. (1993) based upon the imperfect co-movement between capital flows and foreign exchange reserves. The authors argue that developing countries use foreign exchange reserves to eliminate fluctuations in exchange rates stemming from capital flow movements, generating a distorted relationship between capital inflow and foreign exchange reserves. Instead of foreign exchange reserves, Chuhan et al. (1998) use bonds and equity flows to developing countries from the US as a measure of capital flows. Their findings indicate that the interest rates and industrial production in the US, as well as some developing country-specific factors, such as credit rating and equity rates of return, are important determinants of capital flow surges in the late 1980s and early 1990s. The authors also point out that while equity flows are more sensitive to global factors, the impact of domestic factors is more substantial for bond flows. Fernandez-Arias (1996) further shows that middle-income countries' creditworthiness is mainly driven by a decline in international interest rates, so creditworthiness cannot be used to support the "pull" interpretation. Overall, the author asserts that "push factors" are more important for capital flows to middle-income countries.

The debate over pull versus push factors on capital flows carried over in the early 2000s. For instance, Kim (2000) argues that the surge in capital flows to Mexico, Chile, Korea, and Malaysia in the 1990s was mainly driven by the decrease in the world interest rates and the recession in industrialized countries, while domestic factors, such as productivity and demand shocks, are somewhat less critical. Nevertheless, Baek (2006) shows that the factors that drive capital flows to Latin America and Asia differ. While the risk appetite of foreign investors and external factors contribute to capital flows to Asian countries, inflows to Latin American countries are pulled mainly by domestic factors. The author attributes this difference to the availability of asset varieties in these two regions. While private sector equities are abundant in Asia, most portfolio investments in Latin America consist of government debt securities.

In sum, it is widely agreed that while country-specific characteristics are inherent to investors' decisions, global factors are also important in determining capital flows to EMs. Specifically, factors like the global risk environment, the US or world interest rates, and the level of economic activities in developed countries affect capital flows to EMs.

The GFC in 2008 was a significant turning point in the capital flows literature. Along with the low interest rates, the risky activities of financial institutions on mortgage-backed securities gave rise to the housing bubble in the US. As the housing bubble burst, the world economy experienced the most severe economic crisis since the Great Depression in 1929. In response, the Federal Reserve System (FED) and other major central banks started following expansionary monetary policies through asset purchase programs. Hence, global liquidity and international capital flows increased dramatically in this period. Nevertheless, in 2013, the FED announced that it would reduce the amount of assets it purchases (also known as tapering tantrum). This policy change implied the beginning of a decline in global liquidity and a decrease in capital flows to EMs.

Fratzscher (2012) presents an in-depth analysis of the capital flow dynamics around the GFC. The author shows that while the risk phenomenon and push factors drive the capital flows during the crisis, the effects of pull factors are more prominent in the pre-crisis and post-crisis periods. Likewise, Anaya et al. (2017) argue that the expansionary monetary policies of the FED in response to the recession in the post-GFC period pushed flows from the US to EMs. The authors further show that portfolio flows played a vital role in the transmission of the FED's policies to output growth and real exchange rate appreciation in EMs. Lim et al. (2014) also find evidence about the existence of US monetary policies' spillover effects through financial flows to EMs, and they show that portfolio investment is more sensitive than foreign direct investment to quantitative easing of the FED. In contrast to most existing studies, Clark et al. (2020) discuss that the effects of AEs' monetary policies on EMs are overemphasized and are not predominant; instead, output growth differentials between the two groups of countries are more significant in capital flows to EMs.

The studies above indicate that the openness of financial accounts and globalized markets make EMs more sensitive toward developments in AEs, primarily those in the US. A significant risk

associated with financial openness is the sudden stop of capital flows, which typically leads to credit constraints, balance of payment problems, economic uncertainty, and sharp decreases in economic activity (Calvo, 1998). Since capital inflow means foreign currency entry into a country, it also affects the foreign exchange market. In this regard, Baum et al. (2017) argue that the financial indicators in countries with higher exchange rate variability and inflation rates are more vulnerable to capital inflows.

Hence, the literature suggests that economic variables such as the level of economic activity, interest rates, and risk factors in EMs and AEs are the main determinants of international capital flows. Nevertheless, precarious capital flows may cause significant problems in EMs. For instance, credit constraints and sharp appreciation of the real exchange rate may result in lower economic activity. Therefore, in the following section, this study aims to identify the determinants of steady and sustained capital flows, which are inherent to maintaining a stable macroeconomic environment.

3. Data and Methodology

3.1 Capital Flow Data and Principles

The capital flow data is drawn from the International Monetary Fund's International Financial Statistics (IFS) database. The data is sorted under the balance of payments account based on the residency principle, which differentiates residents' and non-residents' transactions on the financial account. We analyze three different types of capital flows, namely, portfolio investment (PI), other investments (OI), and foreign direct investments (FDI). PI is defined as investments in securities such as equities and debt securities issued by the public and private sectors. OI are transactions not sorted under a specific title of the financial account; they include transactions such as currency and deposits, loans, and trade credits. Lastly, investments are classified as FDI if an investor owns at least a 10% share of a firm abroad.

All transactions are categorized as the net acquisition of financial assets and the net incurrence of liabilities. For instance, an FDI by a non-resident to a domestic economy is recorded as an increase in the domestic economy's liabilities. Based on this principle, a negative financial account balance, namely the difference between the net acquisition of financial assets and the net incurrence of liabilities, represents a net inflow to an economy. Accordingly, the net incurrence of liabilities is drawn as a proxy of capital inflows by non-residents. The data spans from 2005q1 to 2022q4. Throughout the study, year-over-year change in the four-quarter-sum of capital inflows is used.

The sample countries are selected based on the EM classification of Duttagupta and Pazarbasioglu (2021). The authors classify EM economies based on their income levels and resemblance to advanced economies regarding economic growth, ability to produce higher-value-added goods, participation in global trade, and integration with the world financial markets. Accordingly, the

authors identify 20 countries. From this list, we omit oil-rich and larger countries (China, Saudi Arabia, and the United Arab Emirates) and the countries that do not have sufficient quarterly data for the period under consideration. Accordingly, the countries analyzed in this paper are Brazil, Chile, Colombia, Hungary, India, Indonesia, Mexico, the Philippines, Poland, South Africa, Thailand, and Turkiye. For each of the 12 countries, there are 72 quarters of data, which makes 864 quarters in total.

Figure 1 presents the average capital flows of the subject countries between 2005 and 2022. All PI, OI, and FDI flows have a slightly increasing trend in the pre-GFC era, possibly due to expansionary monetary policies the FED started to follow in early 2000. With the GFC, a dramatic decline occurred in all types of capital flows, followed by a sharp upturn until the reversal of the FED's expansionary policies in 2013. In the following years, capital flow dynamics can be attributed to the lower interest rates in AEs and some country-specific developments in EMs. In 2016, global FDI flows fell by 13% due to weak global economic growth and world trade volumes (UNCTAD, 2017). Accordingly, a significant decline in FDI is observed for the EMs analyzed in this paper. The latest common factor that affects capital inflows to EMs is the COVID-19 pandemic that broke out in late 2019. The pandemic triggered a severe decline in inflows in all types of capital.

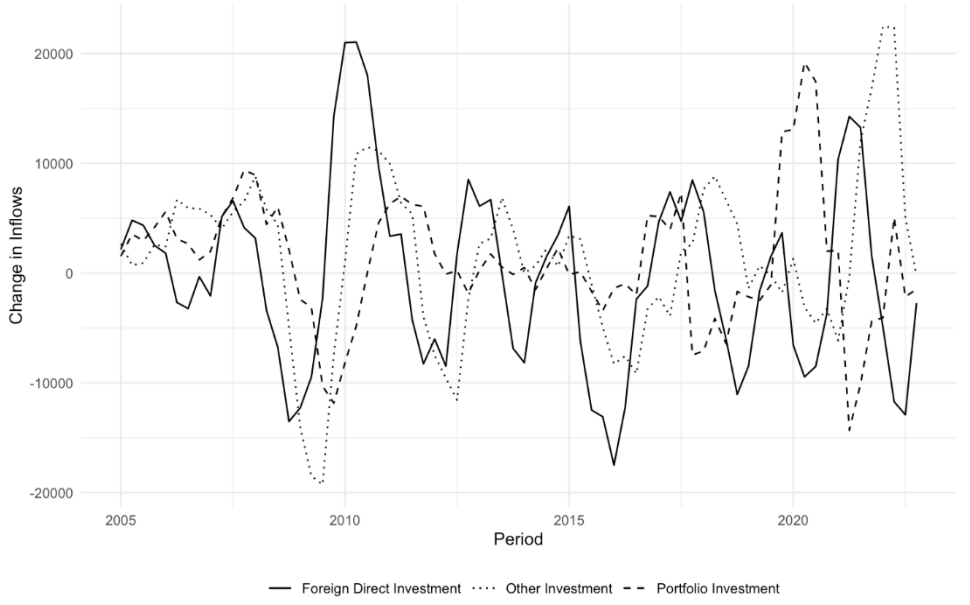

Figure 1: Average Capital Flows (in million USD)
Source: Own elaboration based on IMF (2023).

Figure 2 illustrates the volatility of capital flows generated by five-year rolling standard deviations (SD). In the post-GFC era, all types of capital flows became more volatile. While the volatilities

of PI and OI have converged in recent years, the volatility of FDI has increased dramatically in 2020, possibly due to the effects of the COVID-19 pandemic on the international business environment.

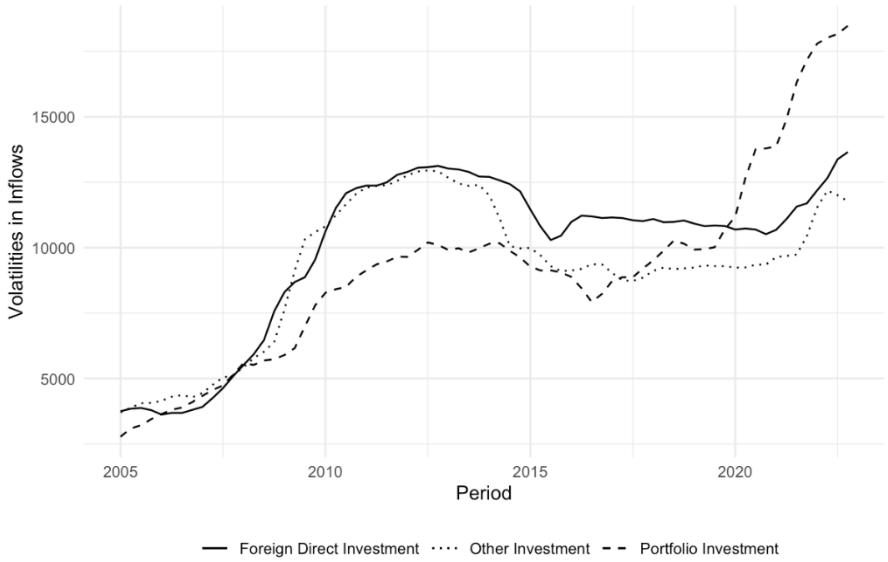

Figure 2: Volatilities in Capital Flows (5-year rolling SD, in million USD)

Source: Own elaboration based on IMF (2023).

3.2 Constructing Sustained Capital Inflow Episodes

As explained above, capital inflows are considered more desirable if they are relatively high, less volatile, and last for a reasonable amount of time. The existing literature involves several studies that analyze extreme capital flow episodes or surges. However, surge episodes may be part of a volatile capital flow period; they may last for a short period and may be interrupted by sharp decreases. Thus, this study aims to differentiate high and stable capital inflow episodes to EMs and identify their determinants.

To mark extreme capital flow movements, Forbes and Warnock (2012) define capital flow episodes based on the SD and length of capital flows. This paper transforms Forbes and Warnock's (2012) methodology to define sustained capital inflow episodes. First, four-quarter capital inflows (CF) are summed up, and their year-over-year changes are calculated as represented by the following two equations:

$$CF_t = \sum_{i=0}^{3} INFLOW_{t-i} \quad (1)$$

$$\Delta CF_t = CF_t - CF_{t-4} \quad (2)$$

Then, the 5-year rolling means and SD of ΔCF_t are computed. In Forbes and Warnock's (2012) framework, a surge episode starts when ΔCF_t climbs up two SD above the mean and ends when it falls below one SD band above its mean. To consider the permanency of capital flows, this study uses 1 and 0.5 SD bands, and sustained capital is defined as episodes of inflows that last at least three quarters. The rationale for using narrower bands is that there are a few quarters in which ΔCF_t remains above the two SD bands for at least three quarters.

Figure 3 exhibits this methodology for Chile. The solid line represents the change in capital inflows to Chile, and the dotted and dashed lines are the 0.5 and one SD bands to determine the thresholds for transitioning to sustained capital inflow episodes. For instance, the change in capital flows into Chile exceeds the one SD band in the last quarter of 2007 and 2011 and the first quarter of 2018. Because these inflow episodes last at least three quarters, they fit our definition of sustained capital inflow episodes. These episodes begin when the solid line exceeds the one deviation band and end when it goes below the 0.5 SD band.

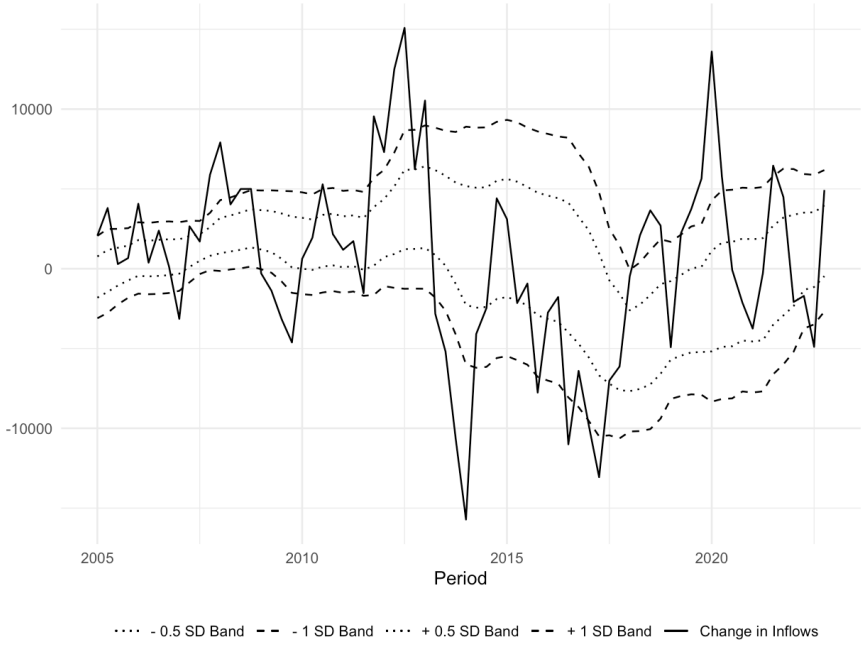

Figure 3: Sustained Inflow Episodes for Chile

Source: Own elaboration based on IMF (2023).

The methodology used in this study generates several binary variables that represent sustained capital inflow episodes. These episodes are represented as $episode_{xq}$, where x refers to the type of flow, and q refers to the minimum number of quarters that the inflow episode continues. For instance, q=4 indicates episodes that last at least one year. As shown above, three types of flows are examined, and 'xs are enumerated according to the following course: 1) PI, 2) OI, and 3) FDI.

Table 1 presents the number of quarters for sustained capital inflow episodes created for each $episode_{xq}$. The values that q takes are 3, 4, and 5; because the interest is on episodes that last at least three quarters, and very few episodes in the data set last more than five quarters. The number of episodes does not considerably vary across types of flows. Based on the existing methodology, about 30% of quarters properly take the value 1 since they are part of a sustained capital inflow episode that lasts at least three quarters. The number of ones gradually decreases as q increases because tightening the criterion by increasing q lowers the probability of being an episode.

Table 1: The number of sustained capital inflow episodes

$x \rightarrow$	Portfolio Investment			Other Investment			Foreign Direct Investment		
$q \rightarrow$	3	4	5	3	4	5	3	4	5
	252	210	130	285	261	145	270	246	162

3.3. Explanatory Variables

A large set of variables that controls several country-specific and global effects on capital inflows to EMs are utilized. GDP for each country represents domestic economic activities. One-lagged GDP values are also used to control for any reverse causality effects. Real interest rates are measured by the difference between the nominal interest rate and the annual inflation rate in quarter t, where the proxy for the nominal interest rate is 2-year government bond yields. Missing nominal interest rates are filled by shorter-or longer-term yields in proportional order.

The value of emerging market currencies is controlled by the consumer price index (CPI) based real effective exchange rate (REER). In the analysis, the rolling SD of inflation and the nominal exchange rates for the preceding two years are used to measure inflation rate and exchange rate volatilities. The external debt-GDP ratio is used as an indicator of the countries' indebtedness. CDS for 5-year government bonds of countries are employed to represent country-specific risks, and 3-month averages of daily CDS values are taken to incorporate them into the quarterly data set.

In addition to the country-specific (pull) factors, a set of variables representing global dynamics that affect capital flows to EMs (push factors) are used. For this purpose, the average GDP growth in the Euro Area, United Kingdom (UK), and the US is used as the global growth rate. The averages of the real interest rates of Germany, France, Italy, the UK, and the US are calculated as the world interest rate. Finally, the S&P 100 volatility index (VIX) is used as the global risk measure.

To get the approximate growth rates of the variables and to identify the effects of changes in explanatory variables on sustained capital inflow episodes, domestic and world GDP, REER, foreign exchange rate volatility, inflation volatility, CDS, and VIX are used in their log-first-differences. Interest rates and debt-to-GDP ratio are used in the models in their first differences. [1] GDP, REER, exchange rates, and CPI data are drawn from the IFS. Interest rates, external debt, and CDS series are received from Refinitiv-Eikon Datastream. Finally, VIX data is extracted from investing.com.

3.4 Empirical Framework

Sustained capital inflow episodes are constructed as a binary variable, and the complementary logarithmic framework is used as the estimation methodology. In binary response variable frameworks, complementary log-log models are generally used when one of the binary dependent variables is rare relative to the other. This is because, while logit and probit functions are symmetric around zero, the complementary log-log function is asymmetric around zero. Because the density of ones (i.e., the sustained capital inflow episodes) in the model varies between 15% and 33% across different durations (3, 4, or 5) of episodes, the complementary log-log model is appropriate for the empirical analysis used in this study.

To find the determinants of sustained capital inflow episodes, the following model is formed:

$$Prob\left(episode_{xq_{nt}} = 1\right) = \boldsymbol{\theta}_{n,t}^{Pull}\boldsymbol{\beta}_{pull} + \boldsymbol{\theta}_{t}^{Push}\boldsymbol{\beta}_{push} \tag{3}$$

where $episode_{xq_{nt}}$ is a dummy variable that takes the value 1 if country n is in a sustained capital inflow episode in quarter t. As aforementioned, x is the type of capital flow, and q is the minimum number of quarters representing the episode. $\boldsymbol{\theta}_{n,t}^{Pull}$ is a vector of pull factors, and it includes the domestic GDP growth and its first lag, domestic real interest rate, real effective exchange rate, foreign exchange rate volatility, inflation volatility, external debt to GDP ratio, and the CDS. $\boldsymbol{\theta}_{t}^{Push}$ is a vector of push factors, which composes global GDP growth, the world real interest rate, and the VIX.

Since the effects of the lagged values of pull and push factors on determining sustained capital flow episodes are crucial, the same specification with the baseline model is also set up by using the lagged values of the explanatory variables:

$$Prob\left(episode_{xq_{nt}} = 1\right) = \boldsymbol{\theta}_{n,t-1}^{Pull}\boldsymbol{\eta}_{pull} + \boldsymbol{\theta}_{t-1}^{Push}\boldsymbol{\eta}_{push} \tag{4}$$

[1] Table A.4 in the Appendix presents the results of unit root tests for each variable.

4. Estimation Results

This section presents the estimation results of the models established based on equations 3 and 4 for different q values of $episode_{xq}$. Tables 2-4 present the baseline results of the study. Domestic GDP is statistically significant in OI and for FDI with 5 quarter episodes. GDP with one lag is significant in all types of capital flows. This implies that maintaining stable and positive growth would help EMs attract and retain high capital flows. The world GDP is positively associated with OI and FDI, and the coefficients are statistically significant. For FDI, this would be because firms may be willing to expand their businesses to EMs when economic activity in AEs is strong.

The REER is the weighted average of a country's currency in relation to its major trade partners, and changes in REER affect a country's trade competitiveness. Based on this notion, the REER is expected to affect capital flows. However, the variable is not significant in any type of capital flow. Also, FX volatility and inflation volatility are expected to result in lower capital flows, but inflation volatility is insignificant under all specifications. The coefficients of FX volatility are negative for PI, so it has a reducing effect on PI, but it is significant only in two of the six specifications; it is insignificant for OI and FDI.

The coefficients for domestic interest rates are positive but small; they are mostly statistically insignificant for PI and OI. For the FDI, however, it is strongly statistically significant in all episode specifications. This indicates that foreign investors use financing opportunities in the host country; as the interest rates increase, the cost of investment increases, and FDI decreases.

The world interest rate is strongly significant and negatively associated with the PI. This indicates foreign investors seek higher income opportunities in EMs through portfolio investments when the world interest rate is low. However, the coefficients of the world interest rates for OI and FDI are insignificant. The insignificance of FDI coefficients indicates and supports the above argument that foreign investors use the financing opportunities of the host country instead of their domestic financial institutions. This may be because financial institutions may not easily evaluate the financial plans of an investment or collateral in another country.

Debt-to-GDP ratios have positive but small coefficients and are statistically significant in some PI and OI specifications. The positive impact may be due to the higher return opportunities that EMs with high debt ratios offer to PI and OI investors. Debt-to-GDP coefficients are positive and significant in most FDI specifications. This may be due to the incentives highly indebted countries offer to FDI investors.

As a risk measure, the coefficient values of CDS for PI episodes range from – 0.698 to – 1.438, and all are significant. It is straightforward that PI investors tend to avoid investments in more risky countries. Nevertheless, CDS is positively associated with OI episodes. This might be due to the types of instruments classified in this category. Instruments under OI might offer higher returns during risky times, or their returns may be insulated from the overall country risks. CDS is also positively associated with FDI episodes and is significant in three of the six specifications.

Even though CDS is a direct measure of risk in financial markets, turbulence in financial markets may significantly inhibit real economic activities. Therefore, it isn't easy to reconcile the positive effects of CDS in FDI episodes. One explanation may be that when country risk increases, the value of assets in EMs decreases, and foreign investors use this opportunity to buy assets with long-term perspectives.

Lastly, as a risk measure, the volatility in stock markets in AEs (VIX) has mixed signs in PI and OI, and they are not statistically significant. For FDI, the coefficients are positive, but only two are significant; one is at a 5 percent level, and the other is at a 10 percent level. As suggested above, stock market volatility is not expected to be decisive in long-term investment decisions.

Table 2: Estimation Results: Portfolio Investment

Dependent Variable: $episode_{1q}$						
Time →	*t*			*t-1*		
q →	3	4	5	3	4	5
Domestic GDP	1.292 (1.466)	2.415 (1.674)	-0.043 (2.009)	1.780 (1.321)	2.253 (1.583)	0.714 (2.303)
Domestic GDP (-1)	2.652** (1.241)	2.606** (1.318)	0.931 (1.023)	3.925*** (1.407)	3.098*** (1.010)	1.161 (0.926)
Domestic Int. Rate	-0.037** (0.010)	0.043 (0.034)	0.036 (0.045)	0.005 (0.018)	0.047 (0.035)	0.016 (0.040)
REER	-1.229 (2.985)	1.289 (1.991)	-1.407 (2.622)	0.872 (2.174)	1.673 (1.788)	-1.327 (2.614)
FX Volatility	-0.299 (0.414)	0.014 (0.478)	-0.702* (0.369)	– 0.245 (0.321)	-0.129 (0.409)	-0.924** (0.362)
Inflation Volatility	-0.211 (0.276)	0.051 (0.314)	0.324 (0.352)	0.164 (0.276)	0.244 (0.244)	0.504** (0.215)
Debt-to-GDP	0.051 (0.040)	0.073* (0.040)	0.049 (0.042)	0.064* (0.035)	0.105*** (0.033)	0.073 (0.048)
CDS	– 0.886** (0.390)	-0.698* (0.385)	-0.873** (0.402)	– 1.438*** (0.402)	-1.427*** (0.514)	-1.404*** (0.446)
VIX	-0.002 (0.188)	0.095 (0.193)	0.011 (0.251)	– 0.087 (0.200)	-0.006 (0.175)	-0.109 (0.252)
World GDP	0.014 (0.039)	0.001 (0.043)	0.029 (0.049)	– 0.027 (0.051)	-0.039 (0.049)	-0.051 (0.058)
World Int. Rate	-0.738*** (0.189)	-0.651*** (0.218)	-0.712*** (0.220)	– 0.669*** (0.241)	-0.685*** (0.251)	-0.812*** (0.265)

Notes: Robust standard errors of each coefficient are represented in parentheses. *t* and *t-1* refer to models estimated with explanatory variables in *t* and *.t-1*. *q* is the minimum length criterion for dependent variables of each model. ***, **, and * refer to 0.01, 0.05, and 0.1 individual significance levels of coefficients.
Source: Own calculations

Table 3: Estimation Results: Other Investment

Dependent Variable: $episode_{2q}$						
Time →	*t*			*t-1*		
q →	3	4	5	3	4	5
Domestic GDP	4.844**	4.141**	7.455**	4.720*	3.569	7.688**
	(2.147)	(2.055)	(3.184)	(2.536)	(2.429)	(3.088)
Domestic GDP (-1)	3.176***	3.005***	4.433***	4.710***	4.163***	5.491***
	(0.990)	(1.012)	(1.274)	(0.851)	(0.867)	(0.925)
Domestic Int. Rate	0.058	0.067	0.008	0.005	0.069**	0.015
	(0.045)	(0.057)	(0.019)	(0.024)	(0.033)	(0.022)
REER	-2.033	-0.922	-1.892	– 2.781	-0.827	-2.334
	(2.439)	(1.941)	(2.784)	(2.836)	(2.093)	(2.993)
FX Volatility	0.226	0.255	0.379	– 0.537*	-0.437	-0.070
	(0.289)	(0.287)	(0.440)	(0.318)	(0.315)	(0.425)
Inflation Volatility	-0.184	-0.058	-0.713	– 0.039	0.071	-0.525
	(0.355)	(0.386)	(0.526)	(0.310)	(0.343)	(0.421)
Debt-to-GDP	0.048	0.037	0.060**	0.047	0.029	0.037
	(0.032)	(0.030)	(0.029)	(0.036)	(0.035)	(0.031)
CDS	1.008***	0.952***	1.462***	0.775*	0.836**	1.218**
	(0.287)	(0.265)	(0.324)	(0.453)	(0.417)	(0.506)
VIX	0.209	0.312	-0.039	0.031	0.055	0.131
	(0.209)	(0.219)	(0.241)	(0.205)	(0.190)	(0.164)
World GDP	0.093***	0.104***	0.050	0.144***	0.157***	0.080**
	(0.024)	(0.025)	(0.041)	(0.033)	(0.033)	(0.038)
World Int. Rate	-0.213	-0.239	0.092	– 0.188	-0.187	0.103
	(0.162)	(0.172)	(0.301)	(0.192)	(0.206)	(0.386)

Notes: Robust standard errors of each coefficient are represented in parentheses. *t* and *t-1* refer to models estimated with explanatory variables in *t* and *t-1*. *q* is the minimum length criterion for dependent variables of each model. ***, **, and * refer to 0.01, 0.05, and 0.1 individual significance levels of coefficients.
Source: Own calculations

Table 4: Estimation Results: Foreign Direct Investment

Dependent Variable: $episode_{3q}$						
Time →	*t*			*t-1*		
q →	3	4	5	3	4	5
Domestic GDP	0.279 (1.641)	1.254 (1.700)	4.019** (1.643)	– 0.158 (0.957)	0.734 (1.035)	3.523*** (1.376)
Domestic GDP (-1)	1.720* (0.903)	1.968** (0.995)	3.704*** (1.144)	1.956** (0.814)	2.006** (0.857)	3.281*** (1.020)
Domestic Int. Rate	-0.091*** (0.020)	-0.097*** (0.016)	-0.105*** (0.022)	– 0.057*** (0.012)	-0.062*** (0.012)	-0.077*** (0.012)
REER	4.638* (2.548)	3.381 (2.727)	2.256 (3.439)	2.728 (2.713)	1.431 (2.390)	0.535 (3.146)
FX Volatility	-0.101 (0.414)	0.038 (0.412)	-0.013 (0.521)	– 0.252 (0.398)	-0.258 (0.382)	-0.442 (0.471)
Inflation Volatility	-0.212 (0.304)	-0.090 (0.260)	0.170 (0.170)	– 0.253 (0.278)	-0.133 (0.252)	0.156 (0.229)
Debt-to-GDP	0.048** (0.024)	0.052** (0.026)	0.076** (0.038)	0.041 (0.026)	0.044 (0.029)	0.075** (0.035)
CDS	0.720** (0.347)	0.825** (0.381)	0.852* (0.465)	0.034 (0.336)	0.167 (0.378)	0.307 (0.433)
VIX	0.270 (0.247)	0.211 (0.204)	0.172 (0.250)	0.365** (0.147)	0.369** (0.164)	0.208 (0.207)
World GDP	0.077* (0.046)	0.085* (0.049)	0.083 (0.074)	0.087** (0.040)	0.088** (0.042)	0.105** (0.046)
World Int. Rate	0.190 (0.204)	0.241 (0.213)	0.443 (0.306)	– 0.075 (0.133)	-0.070 (0.145)	0.148 (0.296)

Notes: Robust standard errors of each coefficient are represented in parentheses. *t* and *t-1* refer to models estimated with explanatory variables in *t* and *t-1*. *q* is the minimum length criterion for dependent variables of each model. ***, **, and * refer to 0.01, 0.05, and 0.1 individual significance levels of coefficients.
Source: Own calculations

4.1. Estimation Results for the Subsamples

In addition to the baseline models, the sustained capital inflow episodes in two subsamples are also investigated. The first subsample is between 2005q1 and 2013q4, and the period between 2014q1 to 2022q4 comprises the second subsample. This decomposition divides the sample period into two halves. The first half includes the pre-GFC period and the period until the FED

announced that it would reduce asset purchases. This division is important because there were significant changes in the interest rate policies and investors' risk appetite due to the GFC and monetary policy changes associated with it.

Tables A.1-A.3 in the Appendix present the estimation results of the models in subsamples. Some of the dynamics of sustained capital inflow episodes are similar to the baseline model. For instance, for PI, domestic GDP growth and its one lag are significant neither in the baseline model nor the subsamples. Still, they are significant for OI in the baseline model and in both of the subsamples. Likewise, world GDP has positive coefficients and is mostly significant for FDI; it has the expected positive sign in both subsamples, but they are strongly significant only in the first subsample.

Nevertheless, some of the dynamics of sustained capital inflow episodes vary from the baseline model. For instance, the world interest rate in the baseline model is significant and has the expected negative sign for PI. While the coefficients are still negative in both subsamples, they are strongly significant in the first subsample, and only two of the coefficients are significant in the second subsample.

Likewise, in the baseline model, coefficients of CDS are negative and strongly significant for PI, and they are positive and strongly significant for OI. Nevertheless, while the sign of the coefficients is the same as in the baseline model, CDS coefficients are significant only in the first subsample of PI and OI. This might reflect the investors' changing risk appetite in the second subsample due to the GFC and the policies associated with it. The risk factor for the developed countries, VIX, is mostly insignificant, and they have mixed signs in the baseline model. However, the coefficients are primarily positive and significant for OI and FDI in the second subperiod. This may reflect investors' increasing risk aversion regarding the stock markets in developed countries after the GFC.

Also, while inflation volatility has mixed signs and is not statistically significant for PI in the baseline model, the coefficients have the expected negative sign and are statistically significant in the first subsample. In the second subsample, the coefficients are positive, and they are again statistically significant. This variation may be explained by changing inflation perception of investors due to higher international liquidity in the post-GFC period.

Hence, while some variables are robust in different periods, some effects vary across the two subsamples. Nevertheless, these discrepancies do not pose a problem for the robustness of the model because GFC was a significant economic shock to the world economy and yielded extraordinary economic dynamics, notably to interest rates and investors' risk perceptions. Also, because the sample size decreases by half, from 72 to 36 for each country, when the data is divided into two subsamples, it may be more difficult to get significant coefficients in subsamples.

5. Conclusion

International capital flows across countries have been a significant economic concern since the opportunities for financial transactions across countries started in the 1980s. Foreign capital became an essential source of economic growth and development for EMs in the 1990s. However, volatile and precarious capital flows may erode the benefits for the receiving economies. For instance, a sharp increase in capital flows may harm the competitiveness of the domestic currency, or a sudden reversal may lead to debt payment problems and economic contraction.

The existing literature has focused on various aspects of capital flows, such as the drivers of capital flows, the relationship between the foreign exchange market and capital flows, and the effectiveness of capital controls in mitigating the adverse effects of sharp changes in capital flows. This study contributes to the literature by defining and examining the dynamics of sustained capital inflow episodes to EMs.

The results indicate that some country-specific factors, such as the domestic GDP growth, domestic interest rates, and CDS premium of EMs, and some factors associated with AEs, such as the level of economic activity and the interest rates in developed countries, affect the likelihood of capital flows to EMs. Regarding the country-specific factors, policymakers in EMs should maintain a sound macroeconomic environment and keep macroeconomic variables in balance for sustained capital inflows. While policymakers in EMs cannot influence the level of economic activity or the interest rates in developed countries, they should take preventive measures against fluctuations in economic situations in AEs and rely less on capital inflows to maintain their basic economic activities.

By decomposing the analysis into two subperiods, it is also shown that economic shocks, such as the GFC, and the policies associated with such major economic events may affect the determinants of capital flows. For instance, while inflation volatility is insignificant for PI flows in the baseline model, the coefficients have the expected negative sign in the first subsample and a positive sign in the second subsample. The changing effects of inflation may be due to changing inflation dynamics in the two sample periods due to monetary policies implemented in response to the GFC. Also, while one lag of domestic GDP is found to be significant in the baseline model for all specifications, it is significant in both subsamples only for OI. The results for the baseline model and varying effects due to major economic events imply that maintaining a positive and stable level of economic activity, low interest rates, and a low level of risk may help EMs to attract sustained capital flows and support their growth prospects.

While evaluating the findings, one should consider that the analysis in this study is based on a binary dependent variable that is idiosyncratically defined for a specific purpose and selected emerging market countries in a definite period. The results in this study may differ from alternative models that directly examine changes in inflows or extreme capital flow episodes. Further works may employ the methodology of this study for other country groups and periods.

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Table A.1: Estimation Results of Subsamples: Portfolio Investment

Dependent Variable: $episode_{1q}$												
Samples →	Subsample 1						Subsample 2					
Time →	*t*			*t-1*			*t*			$episode_{3q}$		
q →	3	4	5	3	4	5	3	4	5	3	4	5
Domestic GDP	-0.189 (2.372)	0.132 (2.470)	2.778 (1.862)	-0.321 (2.478)	-0.857 (2.640)	3.101 (2.418)	-1.194 (3.219)	1.262 (2.471)	0.248 (2.621)	2.690 (3.124)	4.787 (3.009)	3.647 (2.899)
Domestic GDP (-1)	1.130 (2.248)	1.865 (2.293)	3.502** (1.405)	5.064** (2.557)	5.038* (2.644)	4.391 (2.793)	2.183 (1.391)	2.394 (1.863)	1.450 (1.801)	2.112 (1.611)	1.126 (0.902)	1.193 (0.889)
Domestic Int. Rate	-0.013 (0.024)	0.136* (0.076)	0.176* (0.094)	0.025 (0.028)	0.116* (0.070)	0.055 (0.038)	-0.010 (0.054)	0.028 (0.073)	0.022 (0.074)	0.049 (0.058)	0.044 (0.063)	0.040 (0.064)
REER	3.767 (3.542)	6.622* (3.929)	4.892 (5.307)	4.775 (4.120)	6.152 (4.416)	2.427 (4.915)	-5.331 (3.731)	-3.186 (3.812)	-3.673 (4.188)	-1.853 (3.713)	-2.989 (4.269)	-2.144 (3.690)
FX Volatility	-0.349 (0.572)	-1.965*** (0.359)	0.061 (0.724)	-0.394 (0.427)	-0.093 (0.574)	-2.011*** (0.417)	-0.374 (0.396)	-0.181 (0.414)	-0.335 (0.465)	-0.039 (0.412)	-0.221 (0.461)	-0.419 (0.533)
Inflation Volatility	-0.894** (0.429)	-0.882* (0.493)	-1.170* (0.675)	-0.463 (0.581)	-0.739 (0.510)	-0.786 (0.810)	0.778** (0.326)	1.255*** (0.401)	1.029** (0.452)	0.809** (0.374)	1.118** (0.457)	0.955** (0.429)
Debt-to-GDP	-0.023 (0.029)	0.045 (0.029)	0.046 (0.058)	0.034 (0.036)	0.085*** (0.024)	0.095* (0.055)	0.043 (0.047)	0.030 (0.056)	0.024 (0.058)	0.060 (0.088)	0.091 (0.092)	0.094 (0.090)
CDS	-0.725* (0.396)	-0.846** (0.409)	-0.890 (0.660)	-1.442*** (0.513)	-1.592*** (0.596)	-1.516* (0.921)	-1.705* (0.935)	-0.811 (0.957)	-0.775 (1.001)	-1.860** (0.871)	-1.359 (0.886)	-1.225 (0.907)
VIX	0.280 (0.319)	0.360 (0.386)	-0.338 (0.687)	0.113 (0.324)	0.010 (0.352)	-0.894 (0.831)	-0.077 (0.289)	0.045 (0.376)	0.070 (0.364)	-0.179 (0.308)	0.050 (0.316)	0.144 (0.300)
World GDP	0.666 (0.444)	0.532 (0.412)	0.393 (0.476)	0.227 (0.259)	0.129 (0.228)	0.001 (0.592)	0.015 (0.042)	0.026 (0.038)	0.028 (0.039)	-0.077 (0.062)	-0.075 (0.061)	-0.087 (0.056)
World Int. Rate	-0.856*** (0.186)	-0.882*** (0.185)	-1.108*** (0.247)	-0.661*** (0.191)	-0.732*** (0.186)	-0.869*** (0.212)	-0.682 (0.421)	-0.363 (0.574)	-0.261 (0.638)	-0.910* (0.529)	-0.835* (0.644)	-0.817 (0.691)

Notes: Robust standard errors of each coefficient are represented in parentheses. *t* and *t-1* refer to models that are estimated with explanatory variables in *t* and *t-1*. *q* is the minimum length criterion for dependent variables of each model. Subsample 1 focuses on the period between 2005 and 2013, where the remaining part constitutes subsample 2. ***, **, and * refer to 0.01, 0.05, and 0.1 individual significance levels of coefficients.
Source: Own calculations

Table A.2: Estimation Results of Subsamples: Other Investment

Dependent Variable: $episode_{1q}$												
Samples →	Subsample 1						Subsample 2					
Time →	*t*			*t-1*			*t*			*t-1*		
q→	3	4	5	3	4	5	3	4	5	3	4	5
Domestic GDP	7.639*** (1.983)	7.744*** (2.117)	9.521*** (2.901)	8.243*** (2.508)	7.175*** (2.737)	8.813** (3.941)	1.007 (3.326)	1.382 (3.440)	-0.517 (4.699)	1.337 (3.391)	1.639 (3.551)	2.415 (3.583)
Domestic GDP (-1)	4.190*** (1.441)	4.174*** (1.513)	5.034*** (1.880)	6.231*** (1.410)	4.989*** (1.218)	5.971*** (1.657)	1.474* (0.757)	1.690** (0.729)	1.484 (1.290)	2.261*** (0.747)	2.261*** (0.771)	1.786 (1.153)
Domestic Int. Rate	0.113 (0.071)	0.137* (0.073)	0.056 (0.053)	-0.009 (0.029)	0.107 (0.066)	0.023 (0.040)	0.031 (0.063)	0.042 (0.067)	-0.044 (0.055)	0.047 (0.056)	0.063 (0.052)	0.021 (0.048)
REER	-1.423 (3.351)	-0.568 (3.352)	-3.142 (3.512)	-1.977 (3.736)	1.476 (3.625)	-1.116 (4.167)	-2.379 (2.135)	-1.486 (2.377)	0.124 (3.280)	-4.629 (3.182)	-3.189 (3.965)	-5.954 (4.487)
FX Volatility	-0.090 (0.407)	-0.122 (0.517)	-0.153 (0.646)	-0.560 (0.424)	-0.633 (0.545)	-0.464 (0.752)	0.521 (0.493)	0.547 (0.433)	1.406 (0.888)	-0.889** (0.439)	-0.678** (0.332)	0.338 (0.718)
Inflation Volatility	-0.286 (0.407)	-0.296 (0.477)	-0.692 (0.546)	0.236 (0.427)	0.198 (0.441)	-0.202 (0.496)	-0.277 (0.372)	-0.103 (0.355)	-0.914 (0.972)	-0.245 (0.352)	-0.182 (0.356)	-1.001 (0.965)
Debt-to-GDP	0.040* (0.022)	0.019 (0.025)	0.051** (0.025)	0.046 (0.048)	-0.001 (0.030)	0.019 (0.041)	0.034 (0.054)	0.039 (0.056)	0.048 (0.053)	0.051 (0.045)	0.061 (0.051)	0.012 (0.024)
CDS	1.773*** (0.301)	1.784*** (0.274)	1.521*** (0.327)	1.229** (0.582)	1.511*** (0.547)	1.237** (0.524)	0.459 (0.556)	0.454 (0.584)	-0.152 (0.542)	0.375 (0.550)	0.419 (0.569)	0.049 (0.589)
VIX	-0.200 (0.340)	-0.002 (0.322)	0.164 (0.402)	0.021 (0.439)	0.118 (0.401)	0.263 (0.369)	0.496** (0.234)	0.520** (0.266)	0.048 (0.332)	-0.014 (0.198)	-0.031 (0.209)	0.068 (0.206)
World GDP	0.599 (0.367)	0.544 (0.363)	0.365 (0.400)	1.370*** (0.414)	1.375*** (0.442)	1.276** (0.549)	0.065 (0.044)	0.064 (0.045)	0.058 (0.080)	0.087* (0.047)	0.083* (0.050)	0.009 (0.080)
World Int. Rate	0.041 (0.215)	0.095 (0.263)	0.123 (0.241)	-0.170 (0.242)	-0.019 (0.272)	-0.016 (0.279)	-0.582* (0.351)	-0.605* (0.347)	-0.359 (0.703)	-0.423 (0.382)	-0.510 (0.372)	-0.419 (0.844)

Notes: Robust standard errors of each coefficient are represented in parentheses. t and *t-1* refer to models estimated with explanatory variables in *t* and *t-1*. *q* is the minimum length criterion for dependent variables of each model. Subsample 1 focuses on the period between 2005 and 2013, where the remaining part constitutes subsample 2. ***, **, and * refer to 0.01, 0.05, and 0.1 individual significance levels of coefficients.
Source: Own calculations

Table A.3: Estimation Results of Subsamples: Foreign Direct Investment.

Dependent Variable: $episode_{3q}$												
Samples →	Subsample 1						Subsample 2					
Time →	*t*			*t-1*			*t*			*t-1*		
q →	3	4	5	3	4	5	3	4	5	3	4	5
Domestic GDP	-0.066	-0.198	-0.211	-0.829	-1.041	-1.441	-0.378	0.617	7.462*	-0.666	0.287	6.412*
	(2.443)	(2.477)	(3.058)	(2.249)	(2.259)	(2.893)	(3.627)	(3.824)	(4.397)	(2.574)	(2.820)	(3.342)
Domestic GDP (-1)	-1.326	-1.594	-1.741	-2.985**	-3.221***	-4.363**	1.437	1.685	3.572**	1.807	1.669	3.676**
	(1.531)	(1.574)	(2.078)	(1.230)	(1.218)	(1.742)	(1.427)	(1.669)	(1.813)	(1.257)	(1.342)	(1.735)
Domestic Int. Rate	-0.136*	-0.145*	-0.118**	-0.078***	-0.084***	-0.096**	-0.056	-0.051	-0.059	-0.031	-0.023	-0.004
	(0.079)	(0.080)	(0.050)	(0.025)	(0.030)	(0.043)	(0.048)	(0.060)	(0.089)	(0.026)	(0.040)	(0.060)
REER	2.400	2.378	3.052	0.230	0.134	0.378	7.587*	6.130	4.747	5.670	4.155	3.716
	(3.143)	(3.110)	(4.062)	(3.971)	(3.969)	(5.063)	(4.395)	(5.084)	(6.632)	(4.171)	(4.047)	(5.676)
FX Volatility	0.072	0.171	0.137	-0.142	-0.069	-0.237	0.008	0.214	0.295	0.182	0.034	-0.064
	(0.592)	(0.561)	(0.754)	(0.540)	(0.523)	(0.672)	(0.631)	(0.723)	(0.991)	(0.694)	(0.724)	(0.897)
Inflation Volatility	-0.037	0.001	0.036	0.135	0.131	0.027	-0.464	-0.207	0.468	-0.660	-0.431	0.451
	(0.336)	(0.352)	(0.409)	(0.406)	(0.416)	(0.479)	(0.493)	(0.493)	(0.634)	(0.423)	(0.453)	(0.602)
Debt-to-GDP	0.047	0.048	0.067	0.015	0.014	0.044	0.063*	0.073*	0.140**	0.068**	0.084***	0.148***
	(0.031)	(0.032)	(0.056)	(0.040)	(0.042)	(0.078)	(0.038)	(0.039)	(0.064)	(0.027)	(0.031)	(0.023)
CDS	0.869*	0.859*	0.496	0.264	0.285	-0.072	1.465*	1.635*	3.127**	-0.029	0.413	1.686
	(0.449)	(0.461)	(0.397)	(0.496)	(0.514)	(0.405)	(0.878)	(0.947)	(1.457)	(0.937)	(0.960)	(1.365)
VIX	0.053	0.149	0.443	0.361	0.350	0.486	0.526**	0.442**	0.164	0.547***	0.627***	0.434
	(0.484)	(0.464)	(0.424)	(0.321)	(0.318)	(0.322)	(0.257)	(0.179)	(0.247)	(0.141)	(0.183)	(0.417)
World GDP	0.746***	0.770***	0.947***	0.981***	1.005***	1.177***	0.053	0.071	0.016	0.031	0.046	0.071
	(0.190)	(0.191)	(0.328)	(0.206)	(0.210)	(0.382)	(0.069)	(0.084)	(0.141)	(0.063)	(0.078)	(0.091)
World Int. Rate	0.433*	0.440	0.699*	0.149	0.149	0.382	-0.312	-0.302	-0.579	-0.717*	-0.798*	-0.854
	(0.263)	(0.273)	(0.396)	(0.212)	(0.220)	(0.336)	(0.331)	(0.397)	(0.717)	(0.377)	(0.441)	(0.836)

Notes: Robust standard errors of each coefficient are represented in parentheses. *t* and t-*1* refer to models that are estimated with explanatory variables in *t* and *t-1*. *q* is the minimum length criterion for dependent variables of each model. Subsample 1 focuses on the period between 2005 and 2013, where the remaining part constitutes subsample 2. ***, **, and * refer to 0.01, 0.05, and 0.1 individual significance levels of coefficients.
Source: Own calculations

Table A.4: Cross-Sectional Dependence and Unit Root Tests

	CSD Test	Unit Root Tests			
Variables in →	**Level**	**Level**	**Log-Difference**	**Level**	**Log-Difference**
	CD Test	CADF Test	CADF Test	ADF Test	ADF Test
Domestic GDP	49.42	-1.313	-6.086		
	(0.000)	(0.962)	(0.000)		
Domestic Int. Rate	17.09	-2.145	-6.098		
	(0.000)	(0.083)	(0.000)		
REER	12.99	-2.509	-6.038		
	(0.000)	(0.003)	(0.000)		
FX Volatility	15.62	-1.026	-5.730		
	(0.000)	(0.998)	(0.000)		
Inflation Volatility	18.99	-1.724	-5.355		
	(0.000)	(0.584)	(0.000)		
Debt-to-GDP	16.51	-1.786	-6.055		
	(0.000)	(0.490)	(0.000)		
CDS	32.44	-2.272	-6.070		
	(0.000)	(0.031)	(0.000)		
VIX	68.93			-3.670	-10.824
	(0.000)			(0.004)	(0.000)
World GDP	68.93			1.331	-9.530
	(0.000)			(0.996)	(0.000)
World Int. Rate	68.93			0.488	-5.309
	(0.000)			(0.984)	(0.000)

Critical values for the CADF are 2.420, – 2.250, and – 2.150, respectively, for 1%, 5%, and 10% significance levels. The null hypothesis assumes that all series are non-stationary. For the ADF Test, critical values for 1%, 5%, and 10% are respectively – 3.551, – 2.913, and – 2.592. The null hypothesis of this test is that the variable contains a unit root.

Table A.4 presents the results of cross-sectional dependence (CSD) and unit root tests for each variable. We utilize the Pesaran (2021) CD-Test to assess cross-section independence. As the null hypothesis of cross-section independence is rejected across all variables, we proceed with the Pesaran (2007) unit root test, appropriate in the presence of cross-sectional dependence. Also, for cross-sectionally invariant variables, we employ the Augmented Dickey-Fuller unit root test. The findings reveal that, except for REER and VIX, all variables are non-stationary at the 1% significance level when examined at their level, yet they demonstrate stationarity when analyzed through their log differences.