THE CAUSES AND CONSEQUENCES OF INTERNATIONAL CAPITAL FLOWS: AN
EMPIRICAL INVESTIGATION

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ABSTRACT

THE CAUSES AND CONSEQUENCES OF INTERNATIONAL CAPITAL FLOWS: AN EMPIRICAL INVESTIGATION

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During the recent decades, capital flows (CF) tended to substantially increase in advanced (AE), emerging market (EME) and developing economies (DE). CF have been found as amongst the main determinants of growth, business cycles in EME and DE (EMDE). We aim to investigate the main causes and consequences of CF in EME and EMDE. To this end, we first present some stylized facts for CF and their main components in AE, EME, DE and EMDE. The main determinants of capital inflows (CIF) in EME, is investigated in the context of the conventional equations which stresses the importance of main pull (GROWTH) and push (international financial conditions, GFC) augmented with structural domestic conditions (SDC). Considering the potential endogeneity of SDC, we employ a two-step system GMM procedure. The literature often maintains that, the impacts of the main pull and push factors are invariant to the exchange rate regimes (ERR). We investigate whether ERR matters and provides endogeneous thresholds for the impacts of the main factors in explaining CIF in EME. The literature provides mixed results for the consequences CIF to EMDE. The conventional literature postulates that CIF are contractionary against the policy makers perception

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that they are expansionary. We investigate the consequences of CIF by considering the conventional growth equations augmented with GFC and SDC. We also discuss the commonly used growth modelling strategies in the literature and note that they may be misleading as they do not consider simultaneity bias and the inclusion of a fixed cross-country initial income variable leading to an identification problem. We also consider the integration and co-integration properties of variables which these also lead the unbalanced specification of the conventional literature. This study considers all these problems and provides the results using the recent advances in panel data econometrics including FM-OLS and PARDL equilibrium correction mechanisms.

Keywords: The causes and consequences of capital flows, panel autoregressive distributed lag method, panel threshold model, exchange rate regimes, emerging market economies

ÖZ

SERMAYE HAREKETLERİNİN NEDENLERİ VE SONUÇLARI: AMPİRİK BİR İNCELEME

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Son küresel finansal kriz öncesindeki yüksek uyumluluk sürecinde, uluslararası sermaye hareketlerinde (SH) sadece gelişmiş ülkelerde (GÜ) değil, yükselen piyasa (YPE) ve kalkınmakta olan ülkelerde (KE) yüksek bir artış gözlemlenmektedir. SH, özellikle YPE ve KE'de büyüme ve daralma evrelerinin temel belirleyicileri arasındadır. Bu çerçevede, tezin temel amacı SH'nin temel belirleyicilerini ve sonuçlarını incelemektir. Bu kapsamda SH ve temel bileşenlerinin GÜ, YPE ve KE ekonomilerindeki son dönem süreci değerlendirilmektedir. SH'nin temel belirleyicilerinin standart çekim (büyüme) ve itim (küresel likidite koşulları, KLK) modellerinin yanısıra, yapısal ülke koşullarını (YÜK) temsil eden değişkenler de (sermaye hareketleri serbestliği, finansal derinlik, ticaret açıklığı vb.) dikkate alınmaktadır. İktisat yazınında temel itim ve çekim faktörlerinin etkisinin döviz kuru rejiminden (DKR) bağımsız olduğu kabullenilmektedir. Çalışmamızda, SH'nin belirlenmesinde DKR'nin etkisi araştırılmaktadır. Ayrıca, DKR'nin temel değişkenlerin etkisinde içsel eşik değeri olmadığı önermesi incelenmektedir. Ekonomi yazını, SH'nin sonuçları konusunda net bir önermede bulunma-

maktadır. Geleneksel teori SH'nin reel kur değerlenmesi ve uluslararası rekabet koşullarındaki olumsuz sonuçları nedeniyle daraltıcı olduğunu önerirken, politika yapıcılar, bu durumun kredi kısıtını azaltması sebebiyle genişlemeci olduğunu belirtmektedir. Çalışmamızda, SH'nin büyüme üzerindeki etkileri geleneksel büyüme denklemlerine eklemlenmiş KLK ve YÜK de dikkate alarak incelenmektedir. Çalışmada, iktisat yazınında yaygın olarak kullanılan panel veri modelleme yöntemleri tartışılmakta ve içsellik bağıntısı, değişkenlerin bütünleşme ve eş-bütünleşme özellikleri, başlangıç gelirlerinin sabit olması veya dengesiz denklem tanımlamalarının yanıltıcı sonuçlara yol açabileceği önerilmektedir. Tüm bunlar dikkate alınarak panel veri ekonometrisindeki son dönem gelişmeleri çerçevesinde model tahminleri sunulmaktadır.

Anahtar Kelimeler: Sermaye hareketlerinin nedenleri ve sonuçları, panel içsel bağıntı dağılmış gecikmeler modeli, panel eşik modeli, döviz kuru rejimleri, yükselen piyasa ekonomileri

To

Memory of My Little Brother

Halil İbrahim Taşdemir

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CHAPTER 1

INTRODUCTION

International capital flows are broadly defined as the exchange of financial assets between domestic and foreign residents. The recent decades have witnessed a substantial raise in both gross capital inflows (purchases/sales of domestic financial assets by foreign residents) and outflows (purchases/sales of foreign financial assets by domestic residents). During this period, many emerging market economies have lessened the restrictions on capital flows leading them to be much more integrated to international financial markets. Gross capital flows, as a percent of world GDP, for instance, have increased from 5% in the second half of the 1990s to 20% in 2007 and gross external liabilities raised from 60% to the 180% (Guichard, 2017). International financial integration measured as the sum of gross financial assets and liabilities (as a % of GDP in current US dollars) has doubled (from around 100% to 220%, our calculations) in the whole sample of countries (excluding financial centers) from 1990 to 2015. This increase tends to be striking in financial centers (from 400% to 2500%) and advanced economies (100% to 450%). Emerging market and developing economies (EMDE) have also experienced substantial increases (from around 80% to 160%) in international financial integration during this period. Even financial integration is substantially higher in advanced economies, the recent literature suggests that financial integration and thus, international capital flows matter also for EMDE. The crucial importance of international capital flows for EMDE basically arises from the growth and stability concerns for these countries (Koepke, 2019).

International capital flows have often been regarded as one of the main drivers of economic growth, boom and bust episodes and business cycles especially in emerging markets (EME) and developing economies (DE) as reported by the pioneering studies by Calvo et al., (1993; 1996). The results by Kose et al., (2009) indicates that policies promoting financial

development, institutional quality and trade openness tend to help developing countries to derive the benefits of globalization. The recent findings of Kose et al., (2011), Erdem and Özmen (2015) and Rey (2016) provide a support for this critically important issue. The literature reports that capital flows are also associated with crises, financial vulnerabilities and overheating concerns. Capital inflows are often found to be pro-cyclical, that is, they are determined with domestic economic growth along with some other factors in EME and DE (Özmen and Taşdemir, 2019). This pro-cyclicality implies that, capital inflows amplify growth episodes during good times and dampens recessions during the episodes of a financial or real turbulance. This leads capital inflows to deepen the amplitude of business cycles in EME and DE. As commented by Kaminsky et al., (2004), the pro-cyclicality of capital inflows to EME and DE along with the reinforcement among the macroeconomic policy and capital inflows cycle may be interpreted as a "when it rains, it pours" symptom. All these along with the substantial increase in international financial integration have led the investigation of causes and consequences of capital flows to be much more topical and crucially important research topic in international macroeconomics. In this context, this thesis attempts to investigate the main causes and consequences of international capital flows and their main components (i.e. portfolio equity, foreign direct investments (FDI) and other investment flows) in EMDE.

Until recently, the conventional literature has often investigated the behaviors of *net* capital flows, measured as the difference of purchases/sales of domestic assets by foreign residents (gross capital inflows) and the purchases/sales of foreign assets by residents (gross capital outflows), that is indeed a mirror image of the negative of current account balance. However, the recent literature emphasizes that residency of the investor is important in explaining the behaviors of capital flows. Furthermore, especially after the global financial crisis of 2008-2009, there has been a shift in the empirical capital flows literature towards a focus on gross capital inflows and outflows and their sum. There are some important reasons for this shift in focus to gross capital flows. The enormous increase in gross external assets and liabilities, not only in AE but also in EME and DE since the early 1990s to the global financial crisis (the era of great moderation) is one of the basic reasons. The run-up of such gross positions, had led to the risk that these positions may be suddenly unwound in the future. As observed by Davis et al., (2019, p.1), "the global financial crisis itself saw an unprecedented global retrenchment with sharp simultaneous declines in both capital inflows

and outflows". The analysis of gross rather than net flows matters also because the former is much more closely associated with financial stability. Furthermore, aggregate capital flows embody the widespread heterogeneity across the years, components and countries (Lane & Milesi-Ferretti, 2011; Lane & Milesi-Ferretti, 2018). Therefore, the investigation of aggregate capital flows as well as their main components are crucially important.

According to Broner et al., (2013), the stylized facts on capital flows mainly are as follows: (i) The volatility of capital flows has been increased over the years. (ii) Gross capital flows are procyclical, i.e. they increase during the expansionary periods, whilst they decrease during the contractionary periods. (iii) Capital flows and their main components tend to decrease during the crises periods. (iv) Gross capital inflows and outflows tend to move together. Based on these stylized facts, researchers mainly concentrate on two issues considering the capital flows. First group of studies aims to understand the determinants of capital flows. The second group mainly explains the consequences of capital flows.

Following the seminal contributions of Calvo et al., (1993; 1996) and Fernandez-Arias (1996), the recent literature including Montiel (2014), Avdjiev et al., (2018), Koepke (2019) and Eichengreen et al., (2018) investigate the drivers of capital flows mainly within the country-specific (pull) and external (push) factors. The domestic pull factors include domestic growth along with some structural domestic conditions that consist of institutional quality and governance, international financial integration and capital account openness, trade openness and exchange rate regimes. The push factors contain international liquidity and financial conditions, fiscal and monetary policies, growth rates, commodity prices, terms of trade of advanced economies.

The literature, however, provides mixed results for the growth consequences of capital inflows. The conventional literature following the Mundell-Fleming framework maintains that, capital inflows leads to domestic currency appreciation and consequently a deterioration of international competitiveness and thus lower growth. However, the policy makers of EMDE often welcomes higher capital inflows since they reduce their credit constraints allowing additional funding for investment projects and thus leading to higher growth. In this context, Reinhart and Reinhart (2009) suggests that capital inflows are typically associated with appreciations, credit booms and higher growth. Reinhart and Reinhart (2009) further

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points out that capital inflows often play a major role in driving boom and bust cycles in EMDE. Blanchard et al., (2017, p.563) considers these extreme propositions of the growth impact of capital inflows as *schizophrenia*": "Are capital inflows expansionary or contractionary? One would think that the question was settled long ago. But, in fact, it is not. And there is a striking "*schizophrenia*". This study attempts to investigate also this important issue. It is worth noting that there is no a priori reason to assume that all the main components of capital flows have the same effect on economic growth. Furthermore, the impacts of capital flows and their main components on economic growth can be different in the short-run than the long-run. In this thesis, we consider also these important issues.

The basic contents of this thesis as follows. Chapter 2 provides a discussion of the stylized facts of capital inflows and outflows for the whole sample, financial centers (FC), advanced economies (AE), emerging market economies (EME) and developing economies (DE) during the recent decades. To this end, we consider unbalanced annual panel data for 77 AE, DE and EME over the 1990-2015 period. This chapter reports that there has been a remarkable increase in international financial integration and capital flows in all these country groupings. The growth of capital flows, however, decreases, albeit remaining to be positive in AE after the recent global financial crisis. Capital inflows in EME and especially in DE, on the other hand, sustain their higher growth even after the GFC. This chapter argues that, these developments may be explained by the unconventional monetary policies, including quantitative easing and zero lower bound in policy interest rates in AE leading to enhance capital inflows and the consequent rapid recovery in DE and EME. The net capital inflows, the mirror image of the current account balance, tend to be positive in the groups of DE and EME. These current account deficits, on the other hand, are basically financed by foreign direct investments helping to improve their sustainability.

Chapter 2 also investigates a recent empirical puzzle that capital inflows and outflows move together. This is a puzzle since under perfect financial markets, the portfolio choices of residents and non-residents may be expected not to systematically diverge from each other and thus, the correlation between capital inflows and outflows may be expected to be negative or statistically insignificant at best. The recent literature including Broner et al., (2013) and Özmen and Taşdemir (2019), however, suggests that this appears not to be the case. Economic theory suggests that savings should flow from capital-rich countries (AE) to capital-

poor countries (DE and EME), i.e., downhill flow of capital. However, Lucas (1990) reports that, in contrast to the implications of theory, the movement of capital from AE with lower marginal productivity of capital (MPC) to AE with higher MPC is relatively limited. This section also considers the Lucas (1990) paradox and discusses whether it holds for the main components of capital flows.

Chapter 3 investigates the main determinants of capital inflows and their main components in emerging market economies (EME). Chapter 3.1 presents a brief review of the literature on the determinants of capital flows. To empirically investigate the main determinants of capital inflows, in Chapter 3.2, we first consider a simple benchmark equation which attempts to explain capital inflows by the basic pull and push factors. In this context, we maintain that domestic growth (GROWTH) as the main pull factor and global financial/liquidity conditions proxied by VIX (Chicago Board Options Exchanges equity option volatility index) as the main push factor. We also consider structural domestic conditions such as institutional quality represented by freedom (political rights and civil liberties), financial depth and trade openness to explain capital inflows. This section considers also the potential endogeneity of domestic variables for the evolution of capital inflows along with the presence of lagged real GDP (per capita) as an explanatory variable by estimating our equations using two step generalized methods of moments (GMM) dynamic panel estimation procedure.

The conventional wisdom suggests that credible managed exchange rate regimes (ERR) allow countries to import monetary policy credibility (and hence lower inflation) of the anchor currency country and provide exchange rate guarantee. Consequently, it may be plausible to expect that capital flows will be higher in credible managed ERRs (Rogoff et al., 2004). On the other hand, ERR flexibility extends the macroeconomic policy tools as indicated by trilemma in international macroeconomics. In this vein, Edwards (2011) reports evidence that ERR flexibility allows countries to reconcile external shocks. Similarly, Erdem and Özmen (2015) find that the impacts of external real and financial shocks and domestic variables are significantly larger in managed ERRs as compared to floats. Chapter 3.3 considers the ERR issue. For this, we consider the impact of prevailing *de facto* exchange rate regimes -i.e. the actually followed, rather than the officially declared classification by Ilzetzki et al., (2017).

The literature, on the other hand, maintains that the impacts of the main external push and country-specific pull factors are invariant to the prevailing exchange rate regimes. Alternatively, exchange rate regimes may be an endogenous threshold variable by magnifying the impacts of the main drivers of capital inflows. In this context, in the first part of Chapter 3.3, we first take into account the impacts of (floating and managed) exchange rate regimes in explaining the drivers of capital flows. The literature, often, does not consider the integration and co-integration properties of variables in investigating the impacts of exchange rate regimes on capital inflows. We tackle this important empirical issue by by using fully-modified OLS (FM-OLS) procedure of Phillips and Hansen (1990) and Pedroni (2001). The FM-OLS procedure, given that there is co-integration, provides super consistent parameter estimates even in the presence of heterogeneity and serial correlation.

The FM-OLS procedure employed in the first part of Chapter 3.3, however, maintains that the distinction between the managed and floating exchange rate regimes is exogenous. However, the determinants of capital inflows may be depending, not on exogenous thresholds but "endogenously" (data-driven) determined thresholds. The literature is yet to investigate prevailing ERRs provide endogeneous (data-driven) thresholds for the impacts of main push and pull factors on capital inflows. In this vein, in the second part of Chapter 3.3, we investigate this important issue empirically for a balanced panel of EMEs by employing panel threshold model of Hansen (1999). To this end, we postulate that, the change in global financial conditions proxied by ΔVIX as the main push factor and real GDP growth as the main pull factor to explain capital inflows in EMEs. To investigate whether ERR provide significant thresholds, we first maintain that global financial conditions are the thresholding variable. We, then, proceed with postulating that the impact of the main pull factor (GROWTH) varies according to the ERR.

The international macroeconomics literature, following the conventional Mundell-Fleming framework, states that, for a given monetary policy framework, capital inflows leads to appreciation of domestic currency and consequently a contraction in net exports and growth. However, policy makers of emerging market economies believe that, in the presence of a binding domestic saving constraint, access to the foreign capital provides additional funding for investment projects, increases credits and leads to higher growth. In this context, Reinhart and Reinhart (2009) finds that capital inflows often play a major role in driving boom and bust

cycles in emerging market and developing economies (EMDE). These important theoretical and economic policy issues are neatly summarized by Blanchard et al., (2017, p. 563): "Are capital inflows expansionary or contractionary? One would think that the question was settled long ago. But, in fact, it is not. And there is a striking **schizophrenia**". Chapter 4 investigates whether capital flows are expansionary or contractionary in EMDE.

A starting point for a study that aims to investigate the growth consequences of capital inflows may be plausibly expected to review the recent advances in the theory and empirics of the growth literature. Therefore, Chapter 4.1 contains a critical survey of the growth literature. In this context, we first discuss the use of initial income, which is often fixed for cross-section of countries along with a separate intercept term in the conventional growth equations estimated by panel fixed effects procedure. The estimation of such an equation with a panel fixed effects procedure, apparently, is not feasible due to perfect multicollinearity between the constant country-specific initial income variable and the constant term. Consequently, the growth literature often reports the estimation of equations without an intercept term when a constant initial income variable is considered. Chapter, 4.1, warns that, such a procedure may lead to misleading results due to an identification problem, as the initial income variable coefficient may indeed be representing country-specific income differentials instead of the "convergence" term. The panel least squares estimation procedure allows the equations to contain an intercept term along with a fixed initial income variable. However, Chapter 4.1, notes that, both the panel least squares and fixed effects procedures may be subject to potential endogeneity problems of the domestic variables.

Another important contribution of Chapter 4 is that, the conventional growth equations often do not consider the integration and cointegration properties of the variables and therefore, attempts to estimate unbalanced equations. The conventional growth equations, often, attempts to explain a potentially stationary variable (growth) with some non-stationary (I(1)) variables such as human capital, financial development, international financial integration, governance, etc. may, thus, potentially lead to misleading results.

To estimate the impacts of capital inflows and their main components on growth, we consider a benchmark growth equation augmented not only with domestic variables containing human capital, financial development, trade openness, financial openness, institutional

quality but also with a variable representing global financial conditions. Chapter 4, first, reports our estimation results for the conventional growth equations augmented with gross capital inflows (and their main components) along with the variable (VIX) representing global financial and liquidity conditions. Following the conventional literature, we first report the results from the panel least squares and fixed effects procedures. We, then, proceed with the estimation of our equations with employing the dynamic panel two-step system GMM procedure which considers the potential endogeneity of capital inflows variables along with the other domestic macroeconomic variables. In Chapter 4.5, we consider the integration and co-integration properties of the variables, which is often ignored by the conventional growth literature and report the long-run relationships between the variables. To this end, we first report the results for the long-run equilibrium (co-integration) relationships. Finding that, our variable space to explain real GDP (per capita) provides a co-integration relationship, we then proceed with the estimation of panel equilibrium correction mechanisms by employing a re-parametrised panel autoregressive distributed lagged (PARDL) modelling procedure.

The plan of the rest of this thesis as follows. Chapter 2 reports the stylised facts about international capital flows and their main components for advanced, emerging market and developing economies. Also, this chapter provides the basic definitions of capital flows. Section 2.1 defines the international financial integration and shows the evolution of financial integration across the country groups. Section 2.2 briefly reviews the basic components of balance of payments and defines the capital flows and main components. Section 2.3 documents the stylised facts for capital flows by mainly reviewing the summary statistics. Section 2.4 shows the behaviors of capital flows and their main components and argues whether the gross capital inflows and outflows are correlated. Section 2.5 reports the composition of gross and net capital inflows across the years and country groups. Section 2.6 summarizes the main findings and concludes the chapter.

In Chapter 3, we present our empirical results about the determinants of capital inflows and their main components for EME. Section 3.1 briefly reviews the literature. In section 3.2, the determinants of capital inflows are specified as the main pull (GROWTH) and push (VIX) factors along with some important structural domestic variables including freedom, trade openness and financial depth. Considering the potential endogeneity and the presence of lagged dependent variables, our equations are estimated by employing generalized method

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of moments (GMM) of Arellano and Bond (1991) and Arellano and Bover (1995). In Section 3.3, we consider the impact of ERR on capital inflows. In the literature, the linkage between capital inflows and ERR is ambiguous. On the one hand, credible managed ERR allow countries to import monetary policy credibility of the anchor currency country, reduce transaction costs and provide exchange rate guarantee. On the other hand, ERR flexibility extends the macroeconomic policy tools as indicated by trilemma in international macroeconomics. Therefore, this section contributes to this debate by analyzing the determinants of capital flows by considering the prevailing *de facto* ERR. In 3.3.1, we consider the role of ERR in explaining capital inflows. This section takes into account the integration and cointegration properties of variables and hence reports the results from the FM-OLS procedure. The FM-OLS procedure, given that there is co-integration, provides super consistent parameter estimates even in the presence of heterogeneity and serial correlation. In Section 3.3.2, we postulate that impacts of the main pull and push factors may not be invariant to the prevailing ERR. To investigate this issue, this section reports panel threshold procedure results of Hansen (1999). Finally, Section 3.4 concludes this chapter.

In Chapter 4, we investigate whether the impacts of capital inflows and their main components are expansionary. Chapter 4.1, presents a critical review of the recent literature. In Chapter 4.2, we discuss the use of initial income, which is often fixed for cross-section of countries along with a separate intercept term in the conventional growth equations estimated by panel fixed effects procedure. The potential endogeneity problems of the panel least squares and fixed effects procedures are also discussed. Another important contribution of this chapter is that, we note that the conventional growth equations often do not consider the integration and cointegration properties of the variables and therefore, attempts to estimate unbalanced equations. In 4.3.1, we first report panel least squares estimation results from a conventional growth equation with initial income, human capital, financial development variables augmented with capital inflows and global financial conditions. In contrast to the panel fixed effects, the panel least squares procedure allows us to include an initial income variable along with an intercept term, and hence allows us to estimate the conditional convergence parameter. For a robustness check, we estimate the equations also employing the panel fixed effects procedure but with replacing the constant initial income variable with the lagged real income per capita (in purchasing power parity) variable. In Section 4.4, we consider the po-

tential endogeneity of the variables along with the presence of lagged real income and present our two-step system GMM results. Chapter 4.5 substantially diverges from the bulk of the empirical growth literature and takes into account the integration and co-integration properties of the variables. Considering the evidence that, the growth literature often estimates a potentially stationary variable (growth) to be explained by a set of nonstationary variables, the panel cointegration approach may be interpreted to offer a solution to such unbalanced panel equation estimation problem. Chapter 4.5 presents our FM-OLS results and reports that there are cointegrating relationships between real income per capita, capital inflows, human capital, financial development and global financial conditions. By the Granger representation theorem, cointegration implies error/equilibrium correction mechanisms and vice versa. In Chapter 4.6, therefore, we consider panel autoregressive distributed lag (PARDL) procedure. We prefer to employ the PARDL model because it allows to investigate the long-run and short-run relationships along with the short-run dynamics between the variables of interest when it is not known with certainty whether variables of interest are stationary ($I(0)$), non-stationary ($I(1)$) or interrelatedly (Pesaran et al., 1999; Pesaran et al., 2001). The PARDL model is valid regardless of whether the explanatory variables are exogenous or endogenous (Chudik et al., 2013) and hence considers the potential endogeneity of the variables that could be important in explaining the determinants of economic growth. Section 4.7 concludes the chapter.

Finally, Chapter 5, summarizes the main findings of the thesis and presents our concluding notes.

CHAPTER 2

CAPITAL FLOWS AND INTERNATIONAL FINANCIAL INTEGRATION: THE STYLISED FACTS

International capital flows and consequently international financial integration have been substantially increased during the recent decades. During this period, many emerging market economies have lessened the restrictions on capital flows leading them to be much more integrated to international financial markets. Gross capital flows, as a percent of world GDP, for instance, have increased from 5% in the second half of the 1990s to 20% in 2007 and gross external liabilities raised from 60% to the 180% (Guichard, 2017). The recent literature often states that international capital flows can be both beneficial and detrimental to economies (Milesi-Ferretti and Tille, 2011). The beneficial effect of capital flows is related to the growth-enhancing impact by incorporating domestic and foreign savings (Cavallo et al., 2018), increasing the productivity of investment, allocating the risk between domestic and foreign residents and improving the quality of macro economic policies. On the other hand, capital flows can be detrimental to growth by leading appreciation of the exchange rate, overheating of the economy and increasing the probability of crises by raising the financial vulnerability (Cardarelli et al., 2007). All these along with the recent increase in international financial integration has led international capital flows to be amongst to be much more topical in the international macroeconomics literature. In this context, the main aim of this chapter is to present the stylised facts about international capital flows and their main components for advanced, developing and emerging market economies. To this end, this chapter also provides the basic definitions of capital flows.

Until recently, capital flows have been analyzed basically by using the "net" flows definition However, the recent literature remarks that residency of the investor matters for the analysis of capital flows (Levy-Yeyati & Zuniga, 2016). Koepke (2019) suggests that the

benefits of capital flows, measured in terms of consumption and production, differ across the definition of capital flows, i.e. net vs. gross aproach. Consequently, the recent literature often considers also gross capital flows. Consistent with the residency of the investor context, gross capital inflows and outflows, respectively, denote the behaviors of foreign and domestic investors. Gross capital inflows defined as the net domestic financial asset purchases/sales of foreign residents and gross capital outflows correspond to the net foreign financial asset purchases/sales of domestic residents (Broner et al., 2013). Net capital flows are defined as the difference between gross capital inflows and outflows. It should be noted that in the definition of gross capital flows, net financial asset purchases/sales meaning that net changes (increases less reductions) in a specific financial asset category and should not be confused with the net capital flows definition (IMF, Balance of Payments Manual 6th edition).

Net capital flows, as being the mirror image of the current account balance by definition, regard as assets are traded in return for goods and services. Assets enable their owner to be able to have higher future consumption, while goods and services provide basically current consumption. Therefore, net capital flows distinguish the domestic consumption and saving from the domestic investment. Hence, production benefit of net capital flows is the efficient allocation of capital and consumption benefit of net capital flows is the smoothing of consumption. On the other hand, gross capital flows correspond to the exchange of assets for other assets and this diversification behavior produces the similar production and consumption benefits as in the case of net capital flows. However, the risk is unanticipated for gross capital flows and expected for net capital flows. The conventional wisdom suggests that capital moves from the low return country to the high return one and the movement continues until the rate of return equals to the world rate of return. Economic theory suggests that savings will flow from capital-rich countries to the capital-poor countries, i.e., downhill flow of capital. In this vein, Kose et al., (2010) suggests that the movement of capital from capital-rich economies to the capital poor economies should complement constrained domestic saving in capital poor economies and thus provide more investment by lowering the cost of capital. However, Lucas (1990) reports that, in contrast to the implications of theory, the movement of capital from capital-rich to the capital-poor is relatively limited due to the political risk. Consistent with Lucas implying uphill flow of capital, Prasad et al., (2007) find that growth and foreign capital are positively correlated in industrial countries while this is not the case

for non-industrial countries because their limited ability of absorbing foreign capital. Also, Alfaro et al., (2008) state that the low institutional quality leads to uphill flow of capital. On the other hand, the empirical findings of Reinhardt et al., (2013) suggest that capital moves from capital-rich countries to the capital-poor ones after taking into account the degree of capital account openness.

Milesi-Ferretti and Tille (2011) report that aggregate capital flows incorporate the widespread heterogeneity across the years, components and countries. The recent studies, including Blanchard et al., (2017), Eichengreen et al., (2018) and Koepke (2019), on the other hand, convincingly stress the importance of the evolution, causes and consequences of the main components of capital flows. Therefore, consistent with the functional capital flows classification of International Monetary Fund (IMF), we use aggregate and disaggregate capital flows in this study. Disaggregate capital flows mainly consist of portfolio equity, foreign direct investments (FDI) and other investment (mainly banking) flows.

The main aim of this chapter is to present the evolution of aggregate gross and net capital flows and their main components over the recent decades for emerging market, developing and advanced economies along with financial centers. The evaluation of gross capital flows rather than net capital flows matters because the former is closely related to financial stability (Arias et al., 2016). Broner et al., (2013) state that the analysis of gross capital flows is crucially important since foreign and domestic financial investors may have different motivations and stability concerns. Broner et al., (2013) and Levy-Yeyati and Zuniga (2016) state that net capital flows are lower in terms of size and more stable relative to gross capital flows. Koepke (2019) states that gross flows reflect the true movement in actual capital flows since net flows mimic the change in current account balance.

The plan for the rest of this chapter is as follows. In the following part, we define international financial integration and show the evolution of financial integration across to the years and country groups. Section 2.2 provides the definition and measurement issues for capital flows. Section 2.3 reports the main stylised facts for capital flows. Section 2.4 presents the time-series evolution of capital flows and empirically investigates whether the capital inflows and outflows are correlated. Section 2.5 investigates the composition of both gross and net capital flows across to the years and country groups. Finally, Section 2.6 reports

the main findings and concludes the chapter.

2.1 International Financial Integration

Abraham and Schmukler (2018) define financial integration as the *de facto* increase in the movement of capital across the countries and financial globalization as the greater allowance for the financial transactions around the world. In this vein, financial globalization promotes the financial integration. The authors suggest that financial integration can be measured based on the price-based and quantity-based criterions. Price-based criterion of financial integration mainly concentrates on price and interest rate differentials since these differentials should vanish in a fully integrated world. On the other hand, quantity-based criterion of financial integration concentrates on the size of *de facto* movement of capital across the countries. In this study, we focus mainly on the quantity-based criterion of international financial integration.

Lane and Milesi-Ferretti (2003) suggest that IFI provides risk diversification, by exchanging the assets, against the unexpected fluctuations in domestic market returns and measure the international financial integration (IFI) according to the following formula:

$$IFI_{it} = \frac{Assets_{it} + Liabilities_{it}}{GDP_{it}} \tag{2.1}$$

In (2.1), $Assets_{it}$ is the gross stocks of financial assets, $Liabilities_{it}$ is the gross stocks of financial liabilities and GDP_{it} is the GDP in current US dollars. Kose et al., (2010) state that gross stocks of financial assets and liabilities should be used in calculating IFI since annual gross flows tend to be volatile. Based on the volume-based measure of IFI as suggested in (2.1), the greater this ratio implies greater movement of capital across the economies.

Lane and Milesi-Ferretti (2001) and Kose et al., (2003) suggest that international assets trade promotes risk sharing, the efficient allocation of capital and consumption smoothing. Also, these studies report that risk sharing can be achieved mainly by the gross asset trade, efficient allocation of capital and smoothing of consumption can be attained by the net asset trade. Abraham and Schmukler (2018) indicate that all countries have not been able to benefit equally from the international financial globalization that is substantially higher than a few decades ago. Even, they state that financial globalization has been increased the exposure of

countries to the foreign shocks. Therefore, they conclude that the impacts of financial global-
ization may vary depending on the weight assigned to the positive (more integrated financial
system) and negative (more exposure to external factors) effects. The conclusion by Kose et
al., (2010) suggest that countries that encourage the financial sector development, better in-
stitutional environment and trade openness tend to be gain more from financial globalization.
Also, they report that the existence of better macro economic policies is the pre-condition for
taking the advantage of financial integration.

Lane and Milesi-Ferretti (2003) overview the broad trends in cross-asset positions
in advanced economies (AE) over the 1984-2001 period. This study reports that *de facto*
financial globalization has increased by two and a half times according to the volume-based
measure of IFI. Lane and Milesi-Ferretti (2003) further argues that this substantial increase
in IFI could be associated with the raise in international trade since goods trade is directly
related to the financial assets trade. On the other hand, the existence of trade costs can limit
the financial assets trade while trade openness can increase the financial assets trade. In
this vein, the spectacular increase in financial integration could be also associated with the
decline in information and transaction costs (IMF, 2005). The empirical findings by Lane
and Milesi-Ferretti (2003) suggest that trade openness, income per capita and stock market
capitalization are the variables that explain the behaviors of IFI. Lane and Milesi-Ferretti
(2001) report that income per capita, public debt and demographic variables (like age structure
of the population) are important drivers of net foreign asset positions (total assets minus total
liabilities).

Dedola et al., (2012) find that IFI is associated with the greater co-movement of policy
rates across the countries. On the other hand, higher international financial integration appears
to decrease the co-movement in incomes in normal times, whilst, in crisis, the co-movement
in incomes is greater in more financially integrated economies (IMF, 2013). In this context,
Imbs (2006) find that income and consumption cycles are synchronized in financially integra-
ted economies. The theoretical findings by Mendoza et al., (2009) suggest that if financial
globalization supports the financial development and provides benefits like risk sharing and
resource allocation, then integration into the global markets is beneficial to the joining count-
ries. In this vein, Vermeulen and de Haan (2014) provide an empirical support for the findings
of Mendoza et al., (2009). The theoretical results by Coeurdacier et al., (2019) suggest that

the growth and welfare impacts of IFI are heterogeneous based on the idiosyncratic risk and conditioning variables. Chen and Quang (2014) find that the growth impacts of financial integration depends on particular thresholds and this impact is higher in better institutional environment, more financially developed and modest government expenditure economies. The theoretical findings by Perri and Quadrini (2018) suggest that the propensity to catch-up to the crises appears to be lower in financially integrated economies whilst, when they catch-up to the crises, the impacts are larger and more synchronized across the internationally financially integrated countries.

Lane and Milesi-Ferretti (2018) reports the recent broad trends in capital flows. The authors suggest that growth rate of international financial integration has been declined after the global financial crisis. According to the authors, this decline has been associated with the lower capital flows to and from AE especially in the form of banking flows and leading to the interpretation that the relative importance of EME has been seem to increase in the world economy. Lane and Milesi-Ferretti (2018) suggest that cross-border FDI flows have proceeded to increase despite the decrease in the growth of IFI in the post-crisis period.

We now consider the evolution of IFI for groups of countries using "External Wealth of Nations" dataset of Lane and Milesi-Ferretti (2018). Figure 2.1 shows the evolution of IFI in financial centers (FC)[1] and whole sample. According to the Figure 2.1, the level of IFI is almost more than ten times higher in FC than the whole sample. For FC (whole sample), IFI increases substantially from 400% (90%) in the 1990s to 2500% (almost 200%) in the 2000s. However, the growth rate of IFI decreases in both of the samples from 2010 and then onwards.

Figure 2.2 reports the behavior of IFI in advanced (AE), emerging market (EME) and developing (DE) economies. We classify the whole sample countries as advanced, emerging market and developing economies according to Morgan Stanley Capital International Index (MSCI). In 1990-2007 period, IFI level increases by almost three times in AE and two times in EME. For DE, the size of IFI increases about by a half during the 1990-2004 period and decreases in 2004-2008. As compared to the 1990-2007, growth of IFI decreases and the evolution of IFI is almost similar in 2008-2015 for AE and EME. However, at this time period,

[1] Unless otherwise is stated, all the samples (whole, advanced, emerging market and developing economies) considered in this study excludes FC. Classification of the sample countries presented in appendix Table A.3.
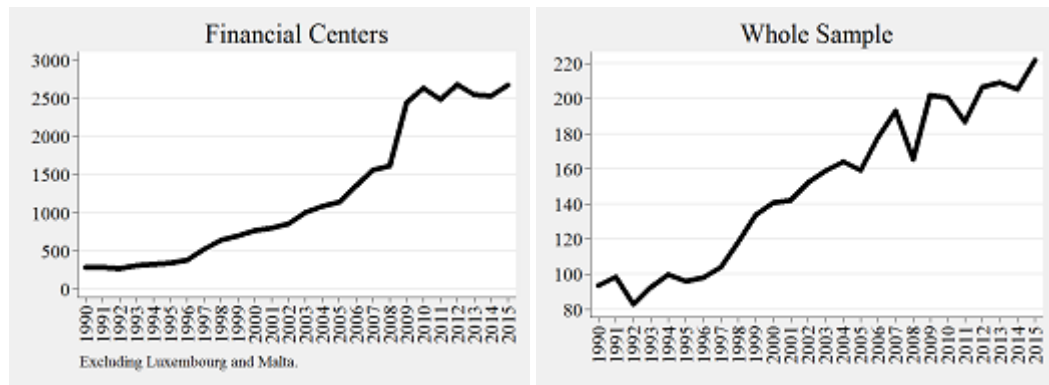
Figure 2.1: International Financial Integration
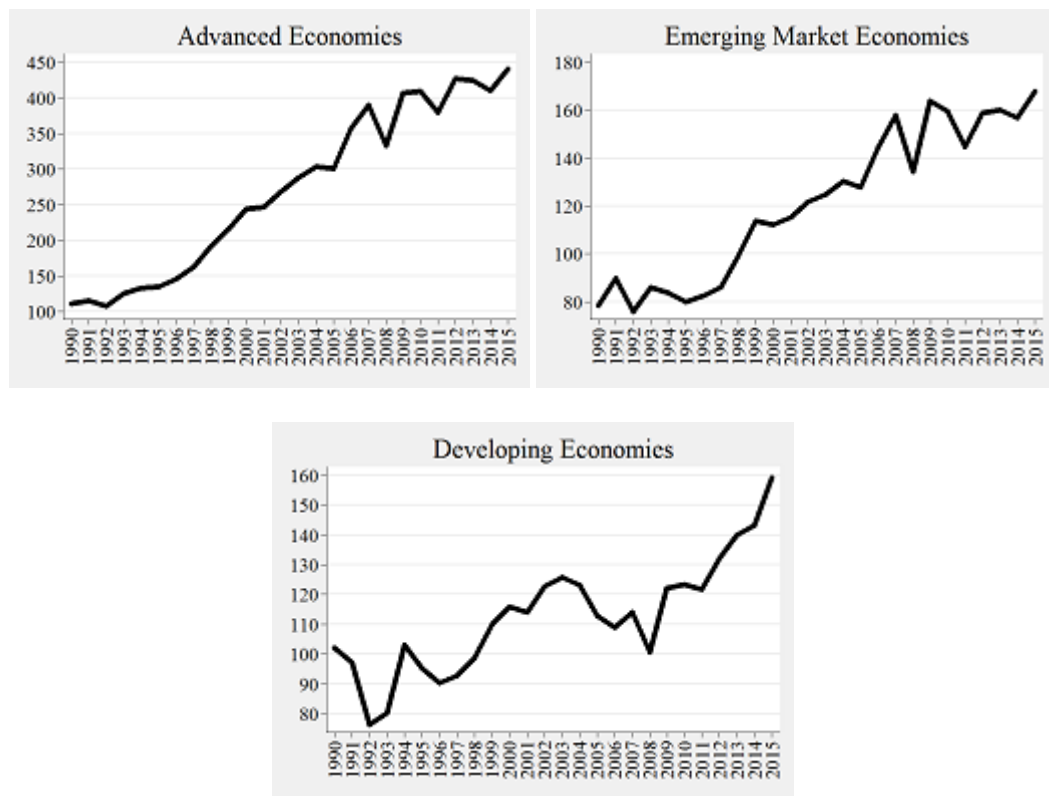
Figure 2.2: International Financial Integration Across Economies

the size of IFI increases substantially in DE. At the end of the sample period, IFI level is almost the same in EME and DE. During the whole sample period, IFI is substantially higher in AE than EME and DE. In the following sections of this chapter, we provide a more detailed discussion on the evolution of capital flows.

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2.2 International Capital Flows: Definitions and Measurement Issues

In this part, we define capital flows and classify them into three main components such as portfolio equity, FDI and other investment flows. To do this, we first present the basic components of balance of payments because it is the main data source for capital flows. To this end, we consider the 6th edition of Balance of Payments Manual of IMF.

Balance of payments is a representation of economic transactions between the domestic and foreign residents by considering the residency of investor. In the appendix, Table A.2 shows the basic items in balance of payments. Balance of payments consists of goods and services account, the primary income account, the secondary income account, the capital account and the financial account. Transactions in the balance of payments are recorded according to double entry accounting system. Double entry accounting system implies that each transaction is recorded as credit and debit items. Balance of payments requires equalization of the sum of credit and debit items.

The current account balance shows the difference between the sum of exports, the primary and secondary income receivable and the sum of imports, the primary and secondary income payable. The capital account balance reports the difference between non-produced nonfinancial assets and capital transfers between residents and nonresidents. Non-produced nonfinancial assets refer to sales of land to embassies and the sales of leases and licenses. Financial account balance shows the difference between sum of financial assets and liabilities. Net financial account balance is the mirror image of the net balance for current and capital accounts. In this sense, the sum of current and capital account is compensated with the financial account. It is important to note that transactions in current and capital accounts recorded in gross terms while transactions in financial account recorded in net terms. Items recorded in financial account in net terms show the difference between the acquisition and disposal of financial assets and liabilities.

In the current and capital accounts, credit item shows the entries from exports, the primary and secondary income receivable and disposals of non-produced nonfinancial assets while debit item shows the entries from imports, the primary and secondary income payable and acquisition of non-produced nonfinancial assets. In the financial account, credit and debit

items show, respectively, the net changes in financial assets and liabilities. Positive and negative change imply the increase and decrease in financial assets/liabilities, respectively. A debit (credit) for an asset implies a positive (negative) change in the financial assets while a debit (credit) for a liability suggests a negative (positive) change in the financial liabilities.

Capital flows show the transactions in financial assets between residents and non-residents. In this context, capital flows are related to the financial account part of balance of payments. Transactions in the financial account classified as direct investment, portfolio investment, financial derivative and employee stock options, other investment and reserve assets. In this thesis, capital flows refer to the sum of direct investment, portfolio investment and other investment. The main reason of excluding financial derivative and employee stock options is that its size is relatively small and the data are unavailable for most of the countries. We also exclude reserve assets because they reflect the policy actions of monetary authorities.

Foreign direct investments (FDI) refer to have a control or significant influence of foreign firms on domestic firms. FDI are measured as the voting power of the non-resident firm in the resident firm. The percentage of equities in a firm determines the voting power of the investor. If the foreign firm has at least 10% or more of the voting power, then the investment is classified as FDI. If the voting power is higher than 50%, then foreign firm has a control on domestic firm. If the voting power is higher than 10% and lower than 50%, then foreign firm or investor has a significant influence on domestic firm (IMF, Balance of Payments Manual 6th Edition). Portfolio equity investment covers the transactions in equity and debt securities. Portfolio investment provides a direct way to access financial markets. In this sense, portfolio investment is more liquid and flexible in comparison to direct investment. Although mainly consisting of equity and debt securities, acquisition of hedge funds shares, private-equity funds and venture capital are also recorded as portfolio investment. Other investments contain capital flows which are not classified as direct investment, portfolio investment and reserve assets. Examples of other investment are other equity, currency and deposits, use of IMF credit, loans from IMF, loans, nonlife insurance technical reserves, life insurance and annuities entitlements, pension entitlements, trade credit and advances, special drawing rights allocation (IMF, Balance of Payments Manual 6th Edition). Aizenman et al., (2009) and Levy-Yeyati and Zuniga (2016) suggest that other investment flows are mainly consist of bank lending.

Levy-Yeyati and Zuniga (2016) argue that components of capital flows have different effects on economies. Therefore, the analysis of disaggregate capital flows is useful since they homogenize the heterogeneous capital flows. Disaggregate capital flows differ from each other in terms of liquidity and duration. For example, direct investment (FDI) regarded as a kind of long term and illiquid investment while portfolio and other investment flows as short term and more liquid financial investment. Taking into account these issues, in this study, we use aggregate and disaggregate gross capital flows.

2.3   Capital Flows Data and Stylised Facts

We consider annual data for 77 countries (by excluding financial center countries). over the 1990-2015 period. The main data source for capital flows [2] is the Balance of Payments and International Investment Position Statistics, IMF and the data measured in current US dollars. We divide capital flows by GDP (measured in current US dollars) to take into account the size of the economy. We especially focused on this period because of the rapid increase in capital flows during this sample. Our country and sample selection is basically determined by data availability. We exclude financial center (FC) countries because of their specialized role as a financial intermediary. Lane and Milesi-Ferretti (2011) [3] indicate that FC countries play an important role in the production of financial services since these countries provide tax advantages and suitable legal framework for financial investment. Due to these advantages, FC countries attract quite high capital flows and in this context they separated from other countries. Lane and Milesi-Ferretti (2018) state that financial asset transactions in FC is either too small or large scale that it inevitably leads to the question of whether it is a real movement in capital flows or not. Therefore, we initially analyze the capital flows for FC[4] and whole sample (excluding FC) and then we further classify the whole sample countries as advanced, emerging market and developing economies according to Morgan Stanley Capital International Index (MSCI). Classification of the sample countries presented in ap-

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[2]   Gross capital inflows and outflows correspond to liability and asset sides of balance of payments, respectively.

[3]   Lane and Milesi-Ferretti (2010) report also that small financial centers are mainly intermediaries, and they have close bilateral financial linkages with the large financial centers.

[4]   Unless otherwise is stated, all the samples (whole, advanced, emerging market and developing economies) considered in this study excludes FC.

pendix Table A.3. The percentage of advanced, emerging market and developing economies in the sample are 20.78, 49.35 and 29.87 respectively.

In this section, we first present some descriptive statistics for aggregate and disaggregate capital flows for our groups of countries. Tables 2.1, 2.2, 2.3, 2.4 show descriptive statistics for aggregate and disaggregate capital flows for FC and whole sample during the 1990-2015 period. We report the descriptive statistics for 1990-1999, 2000-2007 and 2008-2015 periods so as to observe the change in capital flows across the sub-periods. Also, we report the descriptive statistics both including and excluding Luxembourg and Malta from the FC since they attract relatively high capital flows even in the FC sample.

Table 2.1 reports descriptive statistics for gross capital inflows and outflows in FC and whole sample. The average gross capital inflows and outflows are roughly equal in magnitude for FC during the 1990-2015 period. However, the size of gross capital flows is larger more than three times when we include Luxembourg and Malta to the FC sample. Median annual gross capital inflows and outflows are, respectively, 15 (12.9) and 16.7 (14.3) percent of GDP for FC (excluding Luxembourg and Malta) during the 1990-2015 period. When we evaluate the descriptive statistics across the sub-periods[5], we observe that outflows are larger than inflows both in terms of mean and median except 2008-2015 period (even excluding Luxembourg and Malta). We use coefficient of variation (CV, standard deviation divided by the mean) to measure the volatility. The volatility of inflows decreases in 2000-2007 (2008-2015) excluding (including) Luxembourg and Malta while the volatility of outflows increases across the sub-periods. Also, the volatility of inflows is larger than outflows except 2008-2015. The mean and median capital inflows are higher than outflows during the all periods for the whole sample. Size of capital flows (% of GDP) increases in 2000-2007 and decreases in 2008-2015. The volatility of capital flows increases across the sub-periods and decreases during the 2000-2007 period for outflows. The volatility of capital outflows is higher than inflows.

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[5] The main statistics are similar for FC when excluding and including Luxembourg and Malta during the 1990-1999 period because data of these countries are available only after 2002.

Table 2.1: Descriptive Statistics: Capital Flows

		Financial Centers (FC)				Whole Sample			
		Overall	1990-1999	2000-2007	2008-2015	Overall	1990-1999	2000-2007	2008-2015
Capital Inflows	Mean	76.2	12.0	96.2	94.4	5.3	4.4	6.2	5.0
	Mean*	24.3	12.0	32.9	24.3				
	Median	15.0	6.7	26.1	15.9	4.3	4.0	4.8	4.0
	Median*	12.9	6.7	22.7	10.1				
	St. Dev.	232.9	21.4	267.7	258.9	6.9	4.7	8.0	7.0
	St. Dev.*	46.4	21.4	39.4	60.3				
	CV	3.1	1.8	2.8	2.7	1.3	1.1	1.3	1.4
	CV*	1.9	1.8	1.2	2.5				
	Number of Obs.*	161	40	57	64	1508	401	536	571
Capital Outflows	Mean	84.1	15.3	123.8	87.5	3.7	2.7	5.1	3.1
	Mean*	23.0	15.3	36.5	15.7				
	Median	16.7	13.0	26.3	7.5	2.2	2.0	2.8	2.0
	Median*	14.3	13.0	24.6	6.0				
	St. Dev.	252.5	15.0	294.4	276.4	6.2	4.6	7.1	5.9
	St. Dev.*	40.4	15.0	36.7	50.6				
	CV	3.0	1.0	2.4	3.2	1.7	1.7	1.4	1.9
	CV*	1.8	1.0	1.0	3.2				
	Number of Obs.*	161	40	57	64	1507	399	537	571

Source: Authors' calculation.

Notes: * corresponds to the financial center sample by excluding Luxembourg and Malta. The whole sample excludes financial center countries.

Table 2.2: Descriptive Statistics: Portfolio Equity Flows

		Financial Centers (FC)				Whole Sample			
		Overall	1990-1999	2000-2007	2008-2015	Overall	1990-1999	2000-2007	2008-2015
Portfolio Inflows	Mean	27.7	1.7	39.6	32.7	1.3	1.4	1.5	1.1
	Mean*	4.9	1.7	7.7	4.5				
	Median	1.6	1.1	1.9	2.1	0.6	0.7	0.6	0.4
	Median*	1.4	1.1	1.4	1.6				
	St. Dev.	111.9	1.9	137.8	118.7	2.9	2.1	3.2	3.0
	St. Dev.*	13.2	1.9	18.6	11.4				
	CV	4.0	1.1	3.5	3.6	2.2	1.5	2.1	2.7
	CV*	2.7	1.1	2.4	2.5				
	Number of Obs.*	164	43	57	64	1375	366	484	525
Portfolio Outflows	Mean	24.9	6.1	34.2	27.3	1.5	1.2	2.2	1.1
	Mean*	7.5	6.1	11.7	4.6				
	Median	5.8	4.7	8.8	2.2	0.5	0.4	0.7	0.4
	Median*	5.3	4.7	8.2	1.9				
	St. Dev.	86.1	6.2	82.9	109.4	3.1	2.1	3.5	3.1
	St. Dev.*	16.0	6.2	16.2	19.3				
	CV	3.5	1.0	2.4	4.0	2.1	1.8	1.6	2.8
	CV*	2.1	1.0	0.5	0.7				
	Number of Obs.*	162	41	57	64	1295	317	471	507

Source: Authors' calculation.

Notes: * corresponds to the financial center sample by excluding Luxembourg and Malta. The whole sample excludes financial center countries.

Table 2.3: Descriptive Statistics: FDI Flows

		Financial Centers (FC)				Whole Sample			
		Overall	1990-1999	2000-2007	2008-2015	Overall	1990-1999	2000-2007	2008-2015
FDI Inflows	Mean	28.8	3.5	24.3	57.7	2.2	1.6	2.7	2.4
	Mean*	9.0	3.5	6.7	17.1				
	Median	2.4	1.8	4.0	3.8	1.2	0.8	1.7	1.6
	Median*	2.2	1.8	3.1	2.8				
	St. Dev.	109.5	4.6	83.7	164.8	3.2	2.1	3.6	3.6
	St. Dev.*	30.6	4.6	9.9	51.7				
	CV	3.8	1.3	3.4	2.9	1.5	1.3	1.3	1.5
	CV*	3.4	1.3	1.5	3.0				
	Number of Obs.*	196	70	62	64	1865	654	599	612
FDI Outflows	Mean	27.8	2.7	35.9	44.6	0.9	0.5	1.1	1.0
	Mean*	6.8	2.7	7.3	10.9				
	Median	2.8	1.2	4.2	4.2	0.2	0.1	0.3	0.3
	Median*	2.1	1.2	3.9	2.7				
	St. Dev.	103.6	3.3	107.2	140.5	2.6	1.2	3.2	2.9
	St. Dev.*	19.7	3.3	13.5	31.3				
	CV	3.7	1.2	3.0	3.2	2.9	2.4	2.9	2.9
	CV*	2.9	1.2	1.8	2.9				
	Number of Obs.*	196	70	62	64	1793	592	589	612

Source: Authors' calculation.

Notes: * corresponds to the financial center sample by excluding Luxembourg and Malta. The whole sample excludes financial center countries.

Table 2.4: Descriptive Statistics: Other Investment Flows

		Financial Centers (FC)				Whole Sample			
		Overall	1990-1999	2000-2007	2008-2015	Overall	1990-1999	2000-2007	2008-2015
Other Investment Inflows	Mean	14.2	8.1	31.6	3.6	1.4	1.3	1.8	1.2
	Mean*	10.1	8.1	20.3	2.3				
	Median	2.7	2.7	13.11	0.1	0.6	0.7	0.7	0.5
	Median*	2.4	2.7	12.7	-0.2				
	St. Dev.	45.8	18.2	68.2	32.0	4.7	3.7	5.7	4.7
	St. Dev.*	24.1	18.2	23.0	27.3				
	CV	3.2	2.2	2.2	8.9	3.4	2.8	3.2	3.9
	CV*	2.4	2.2	1.1	11.9				
	Number of Obs.*	196	70	62	64	1875	675	599	601
Other Investment Outflows	Mean	23.5	7.3	48.9	15.4	1.3	1.1	1.8	1.1
	Mean*	8.1	7.3	17.3	0.1				
	Median	3.3	3.0	15.9	0.2	0.5	0.5	0.7	0.3
	Median*	2.8	3.0	12.6	-0.1				
	St. Dev.	92.7	12.2	123.3	99.2	3.3	2.5	3.4	3.8
	St. Dev.*	19.5	12.2	20.3	21.7				
	CV	3.9	1.7	2.5	6.4	2.5	2.3	1.9	3.5
	CV*	2.4	1.7	1.2	217				
	Number of Obs.*	196	70	62	64	1825	631	593	601

Source: Authors' calculation.

Notes: * corresponds to the financial center sample by excluding Luxembourg and Malta. The whole sample excludes financial center countries.

Table 2.2 presents descriptive statistics for portfolio equity flows in FC and whole sample. Despite the average value of portfolio inflows and outflows are similar during the 1990-2015 period, the mean values differ across the sub-periods for FC. The average value of portfolio equity outflows is larger than inflows across the sub-periods excluding Luxembourg and Malta while the mean portfolio equity outflows is higher than inflows only in 1990-1999 period for FC including Luxembourg and Malta[6]. Median portfolio equity outflows and inflows are, respectively, 5.8 (5.3) and 1.6 (1.4) percent of GDP for FC (excluding Luxembourg and Malta). Median portfolio equity outflows is larger than inflows during the whole period. The volatility of portfolio equity inflows increases across the sub-periods, while the volatility of portfolio equity outflows increases (decreases) during the almost all period (in 2000-2007 period) for FC (excluding Luxembourg and Malta). Also, the volatility of portfolio equity inflows is higher than outflows excluding Luxembourg and Malta in FC. For the whole sample, the mean (median) values are 1.3 (0.6) for portfolio equity inflows and 1.5 (0.5) for outflows suggesting that they are similar in magnitude. The mean of portfolio equity inflows and outflows decreases in 2008-2015 period. The volatility of portfolio equity inflows increases during the whole sample period, while the volatility of portfolio equity outflows decreases during the 2000-2007 period. In comparison to portfolio equity inflows, the volatility of outflows is relatively higher except 2000-2007.

Table 2.3 shows descriptive statistics for FDI inflows and outflows in FC and whole sample. The average FDI inflows and outflows increases across the periods for FC (both including and excluding Luxembourg and Malta). In general, the mean FDI outflows (inflows) is higher than inflows (outflows) including (excluding) Luxembourg and Malta in FC except 1990-1999[7]. Median annual FDI inflows and outflows are, respectively, 2.4 (2.2) and 2.8 (2.1) percent of GDP in FC (excluding Luxembourg and Malta). Median FDI inflows is higher than outflows except 2000-2007 period for FC (excluding Luxembourg and Malta). The volatility of FDI inflows and outflows increases across the sub-periods and volatility of inflows is higher than outflows except 2000-2007 period for FC (excluding Luxembourg and Malta). The average FDI inflows and outflows (percent of GDP) increases across the periods

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[6] The main statistics are similar for FC when excluding and including Luxembourg and Malta during the 1990-1999 period because data of these countries are available only after 2002.

[7] The statistics are similar for FC when excluding and including Luxembourg and Malta during the 1990-1999 period because data of these countries are available only after 2002.

except 2008-2015 for the whole sample. The mean FDI inflows is higher than outflows during the whole periods. Median FDI inflows and outflows are, respectively, 1.2 and 0.2 percent of GDP and median inflows is higher than outflows. The volatility of FDI flows increases during the whole sample period. In contrast to FC, the volatility of FDI outflows is higher than inflows in the whole sample.

Table 2.4 reports descriptive statistics for other investment flows i.e., mainly banking flows in FC and whole sample. Mean other investment inflows and outflows (percent of GDP) increases until the 2008-2015 period for FC (both including and excluding Luxembourg and Malta). There is a sharp decrease in mean other investment flows in 2008-2015 period for FC. Mean inflows is higher than outflows for the whole period (excluding Luxembourg and Malta). Median outflows (percent of GDP) is almost higher than inflows during the whole periods for FC (both including and excluding Luxembourg and Malta). The volatility of flows increases across the periods including Luxembourg and Malta and decreases only in 2000-2007 period excluding Luxembourg and Malta in FC. However, the volatility is substantially higher in 2008-2015. The average other investment inflows and outflows increases during the almost all periods but decreases in 2008-2015 period for the whole sample. Overall, the mean of other investment inflows is higher than outflows. Median inflows and outflows are, respectively, 0.6 and 0.5 and median inflows is higher than outflows across the all periods. The volatility of other investment inflows increases during the whole period and the volatility of outflows decreases in 2000-2007. Similar to the FC, the volatility of other investment flows is higher in 2008-2015. In contrast to the FC (excluding Luxembourg and Malta), the volatility of other investment inflows is higher than outflows.

A clear picture emerges from the analysis of descriptive statistics reported in Tables 2.1, 2.2, 2.3 and 2.4. The behavior of capital flows is different in FC than the whole sample. Inclusion of Luxembourg and Malta in FC sample distorts the descriptive statistics. The distortion in statistics is more visible from the 2000 then onwards because data of these countries are available only after 2002. Exclusion of Luxembourg and Malta from the FC sample provides a better understanding of the evolution of capital flows since they are outliers even in the FC sample. Therefore, we overview the evolution of capital flows in FC by excluding Luxembourg and Malta during the rest of the chapter. Also, the analysis of descriptive statistics reveals that the movement of capital, in terms of mean, increases in 2000-2007 and

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decreases during the 2008-2015 period for the FC and whole sample. This pattern is also true for disaggregate capital flows, except FDI flows in FC sample. The volatility of capital inflows and main components increases during the 2008-2015 period, albeit it is more obvious in other investment -mainly banking- flows. However, the volatility of capital outflows and main components (except FDI) decreases during the 2000-2007 period both in FC and whole sample.

We consider the main statistics for aggregate and disaggregate capital flows in advanced (AE), emerging market and developing (EMDE) economies. Table 2.5 reports the descriptive statistics for capital flows in AE and EMDE. Even the mean capital inflows and outflows are roughly equal in magnitude during the 1990-2015 period, the change in the mean values are substantial across the sub-periods. For example, the mean capital inflows and outflows increases approximately by two times from 1990-1999 to 2000-2007 and then they substantially decrease in AE. The mean capital inflows is higher than outflows in 1990-1999 while the mean capital outflows is higher than inflows in 2000-2007 and 2008-2015 periods. Median capital flows follows the similar pattern as mean. The volatility of capital inflows and outflows as measured by coefficient of variation (CV, standard deviation divided by the mean) are roughly equal to each other during the 1990-2007 period. But, the volatility of capital flows increases substantially during the 2008-2015 period, which indeed corresponds to the period of the recent post global financial crisis.

For EMDE, the mean capital inflows increases steadily across the periods. However, the mean capital outflows increases by two times from 1990-1999 to 2000-2007 and decreases in 2008-2015 perid. The pattern in median capital flows is similar to the mean. The volatility of capital inflows (outflows) increases (decreases) in 2000-2007 period and decreases (increases) in 2008-2015 period. Volatility of capital outflows is higher than inflows during the whole sample period. As compared to the AE, volatility of capital flows is almost higher in EMDE. However, in comparison to EMDE, volatility of capital inflows is relatively higher in AE in 2008-2015 period.

Table 2.5: Descriptive Statistics of Capital Flows: Whole Sample

		Advanced Economies				Emerging Market and Developing Economies			
		Overall	1990-1999	2000-2007	2008-2015	Overall	1990-1999	2000-2007	2008-2015
Capital Inflows	Mean	6.1	5.1	9.5	3.7	5.0	4.1	5.1	5.4
	Median	4.8	4.4	7.3	3.0	4.0	3.6	4.0	4.3
	St. Dev.	6.9	4.6	7.3	7.3	6.9	4.7	8.0	6.8
	CV	1.1	0.9	0.8	2.0	1.4	1.1	1.6	1.3
	Number of Obs.	391	135	128	128	1117	266	408	443
Capital Outflows	Mean	7.0	4.9	11.0	5.1	2.5	1.6	3.2	2.5
	Median	4.8	3.3	9.3	4.0	1.7	1.2	1.9	1.7
	St. Dev.	7.8	4.8	8.8	7.8	5.0	4.1	5.3	5.2
	CV	1.1	1.0	0.8	1.5	2.0	2.6	1.7	2.1
	Number of Obs.	391	135	128	128	1116	264	409	443

Source: Authors' calculation.

Table 2.6: Descriptive Statistics of Portfolio Flows: Whole Sample

		Advanced Economies				Emerging Market and Developing Economies			
		Overall	1990-1999	2000-2007	2008-2015	Overall	1990-1999	2000-2007	2008-2015
Portfolio Inflows	Mean	2.6	2.2	4.1	1.4	0.8	0.9	0.6	1.0
	Median	1.9	1.3	3.2	1.3	0.4	0.5	0.4	0.3
	St. Dev.	3.9	2.6	3.9	4.6	2.2	1.7	2.3	2.3
	CV	1.5	1.2	1.0	3.3	2.8	1.9	3.8	2.3
	Number of Obs.	382	126	128	128	993	240	356	397
Portfolio Outflows	Mean	3.5	2.2	5.5	2.6	0.7	0.4	1.0	0.6
	Median	2.2	1.3	4.4	2.0	0.2	0.2	0.4	0.2
	St. Dev.	4.6	2.7	4.7	5.3	1.7	1.1	1.8	1.7
	CV	1.3	1.2	0.9	2.0	2.4	2.8	1.8	2.8
	Number of Obs.	382	126	128	128	913	191	343	379

Source: Authors' calculation.

Table 2.7: Descriptive Statistics of FDI Flows: Whole Sample

		Advanced Economies				Emerging Market and Developing Economies			
		Overall	1990-1999	2000-2007	2008-2015	Overall	1990-1999	2000-2007	2008-2015
FDI Inflows	Mean	1.6	1.2	2.2	1.3	2.4	1.7	2.9	2.7
	Median	0.8	0.7	0.9	0.7	1.4	0.9	1.8	1.8
	St. Dev.	2.5	1.7	3.5	1.9	3.3	2.2	3.7	3.8
	CV	1.6	1.4	1.6	1.5	1.4	1.3	1.3	1.4
	Number of Obs.	400	144	128	128	1465	510	471	484
FDI Outflows	Mean	2.0	1.4	2.7	1.8	0.5	0.2	0.6	0.7
	Median	0.9	0.7	1.3	1.4	0.1	0.0	0.2	0.2
	St. Dev.	3.0	2.1	4.2	2.1	2.4	0.7	2.7	3.0
	CV	1.5	1.5	1.6	1.2	4.8	3.5	4.5	4.3
	Number of Obs.	391	135	128	128	1402	457	461	484

Source: Authors' calculation.

Table 2.8: Descriptive Statistics of Other Investment Flows: Whole Sample

		Advanced Economies				Emerging Market and Developing Economies			
		Overall	1990-1999	2000-2007	2008-2015	Overall	1990-1999	2000-2007	2008-2015
Other Investment Inflows	Mean	1.8	1.5	3.1	0.9	1.3	1.2	1.5	1.3
	Median	0.7	0.6	1.3	0.2	0.6	0.7	0.5	0.6
	St. Dev.	4.7	2.9	4.4	6.2	4.7	3.9	5.9	4.2
	CV	2.6	1.9	1.4	6.9	3.6	3.3	3.9	3.2
	Number of Obs.	410	154	128	128	1465	521	471	473
Other Investment Outflows	Mean	1.5	1.1	2.7	0.8	1.3	1.1	1.6	1.2
	Median	0.5	0.5	0.9	0.2	0.5	0.5	0.7	0.4
	St. Dev.	4.0	2.3	3.8	5.2	3.1	2.5	3.2	3.4
	CV	2.7	2.1	1.4	6.5	2.4	2.3	2.0	2.8
	Number of Obs.	403	147	128	128	1422	484	465	473

Source: Authors' calculation.

Table 2.6 presents descriptive statistics for portfolio equity flows in AE and EMDE. Mean inflows and outflows increases almost two times from 1990-1999 to 2000-2007 and then decreases to one-third for inflows and half for outflows in 2008-2015 in AE. Although mean portfolio inflows and outflows are identical in 1990-1999, the mean outflows is higher than inflows for the rest of the period. The similar picture emerges for the median portfolio inflows and outflows. Volatility of inflows and outflows decreases in 2000-2007 than in 1990-1999 and inflows (outflows) increases by three (two) times in 2008-2015. Volatility of portfolio inflows is higher than outflows during the whole period for AE. For EMDE, mean portfolio inflows (outflows) decreases (increases) from 1990-1999 to 2000-2007 and increases (decreases) from 2000-2007 to 2008-2015. Mean portfolio inflows is higher than outflows, except 2000-2007 period. Median portfolio inflows decreases across the sub-periods while median portfolio outflows increases only in 2000-2007. Median inflows is higher than outflows during the whole period. Volatility of portfolio inflows increases by two times in 2000-2007 than in 1990-1999 and then decreases by 40% in 2008-2015. Volatility of outflows is lower only in 2000-2007 and it is similar in terms of magnitude during the other periods. Volatility of outflows is larger than inflows in 1990-1999 and 2008-2015 and volatility of inflows is larger than outflows in 2000-2007. It is interesting to note that the volatility of inflows (except 2008-2015) and outflows is higher in EMDE than AE, although the size of portfolio flows is larger in AE than EMDE.

Table 2.7 shows main statistics for FDI flows (as percent of GDP) in AE and EMDE. Mean FDI inflows and outflows increases almost by two times from 1990-1999 to 2000-2007 and they decreases substantially in 2008-2015 for AE. Mean outflows is higher than inflows during the whole periods. The pattern for median flows is almost same with mean except median FDI outflows increases in 2008-2015. Volatility of FDI flows increases from 1990-1999 to 2000-2007 and decreases in 2008-2015. Volatility of FDI outflows is slightly higher than inflows except 2008-2015. For EMDE, mean FDI flows almost doubles in 2000-2007 as compared to 1990-1999. Mean FDI inflows (outflows) decreases (increases) slightly in 2008-2015. Mean FDI inflows is higher than outflows. Median FDI flows increases substantially in 2000-2007 than 1990-1999. Median FDI inflows is higher than outflows for the whole period. Volatility of FDI inflows increases slightly for the whole periods and outflows decreases slightly in 2008-2015. Volatility of FDI outflows is substantially (almost four times) higher

than inflows. This result is consistent with the findings of Eichengreen et al., (2018) suggesting that FDI outflows are more volatile in EME (Eichengreen, Gupta, & Masetti, 2018). As compared to EMDE, volatility of FDI inflows is slightly higher in AE. However, volatility of FDI outflows is substantially higher in EMDE than AE.

Table 2.8 reports descriptive statistics for other investment inflows and outflows - mainly banking flows- in AE and EMDE. Mean flows increases almost by two times from 1990-1999 to 2000-2007 and decreases substantially during the 2008-2015 period for AE. Mean inflows is higher than outflows during the whole periods. The same pattern holds also for median flows. Volatility of flows increases substantially in 2008-2015. Volatility of outflows is larger than inflows in 1990-1999 while volatility of inflows is larger than outflows for the rest of the sample period. For EMDE, mean and median flows increases slightly from 1990-1999 to 2000-2007 and decreases slightly after the recent global financial crisis (2008-2015). Mean inflows is higher than outflows except 2000-2007. Volatility of inflows (outflows) is relatively higher (lower) in 2000-2007 and lower (higher) in 2008-2015. Volatility of inflows is higher than outflows during the whole periods. Mean other investment flows is higher in AE than EMDE in 1990-2007, while mean flows is slightly higher in EMDE in 2008-2015. On the other hand, volatility of other investment inflows and outflows is relatively higher in EMDE during the 1990-2007 period. However, the volatility of other investment flows is substantially higher in AE during the 2008-2015 period.

The analysis of descriptive statistics suggests that the behaviors of aggregate and disaggregate capital flows are different in 2000-2007 than 2008-2015. For AE, there is a substantial increase in capital flows during the 2000-2007 period while capital flows is more moderate (except FDI) in EMDE. However, capital flows decreases substantially for AE and slightly for EMDE in 2008-2015 period. Also, volatility of capital flows (except FDI) increases substantially in AE during the 2008-2015 time period. In comparison to AE, capital flows (except FDI) is more volatile in EMDE during the 1990-2007 period.

2.4 Capital Inflows and Outflows: Do They Move Together?

The recent literature suggests a potentially puzzling result that gross capital inflows (net purchases of domestic assets by foreign residents) and outflows (net purchases of foreign assets by domestic residents) tend to move together (Broner et al., 2013 and Davis and van Wincoop, 2018). Under perfect financial markets with no asymmetric information, frictions and home bias, the portfolio choices of residents and non-residents may be expected not to systematically diverge from each other especially in the long-run. Consequently, as argued by Blanchard and Acalin (2016, p.1), the correlation between capital inflows and outflows "should be close to zero or even negative: If a country is for some reason more attractive to foreign investors, it is not obvious why domestic investors would want to invest more abroad". The literature, however, often finds that, this is not the case for gross capital inflows and outflows. Broner et al., (2013), for instance, finds that when foreigners invest in a country, domestic agents invest abroad, and vice versa. Barrot and Serven (2018) also finds that capital inflows and outflows are highly correlated. The presence exchange rate risk (Broner et al., 2013) leading to differences in expected returns, is also amongst the basic explanations of the co-movement of capital inflows and outflows. Milesi-Ferreti and Tille (2011) suggests relative perceived riskiness of home and foreign assets and the consequent differential shocks to risk aversion as a source of asymmetry. Relative expected deterioration of property rights of non-residents leading them to have an incentive to sell domestic assets in the case of a financial turbulence may also lead to an asymmetry according to Broner et al., (2010). According to Tille and van Wincoop (2010), the portfolio growth component of capital flows can generate positive correlation between capital inflows and outflows when saving rates move together across countries. The results by Davis and van Wincoop (2018) support a postulation that higher international financial integration leads to co-movement of capital inflows and outflows. Recently, Özmen and Taşdemir (2018) finds that the twin behaviour of capital inflows and outflows tends to be the case for the long-run. According to Özmen and Taşdemir (2018), the short-run relations, however, often appear to be consistent with the conventional theory suggesting that the behaviours of residents and non-residents do not systematically diverge from each other.

Figure 2.3 reports the evolution of aggregate capital inflows and outflows for FC and whole sample during the 1990-2015 period. The size of capital flows (% of GDP) increases till the second half of the 2000s, peaks in 2007 and then decreases in both of the samples. The size of gross capital flows is substantially higher in FC. There is a strong co-movement between capital inflows and outflows. In comparison to the whole sample, positive correlation appears to be much higher in FC. Net capital flows (difference between gross capital inflows and outflows) are positive for the whole sample in 1990-2015.
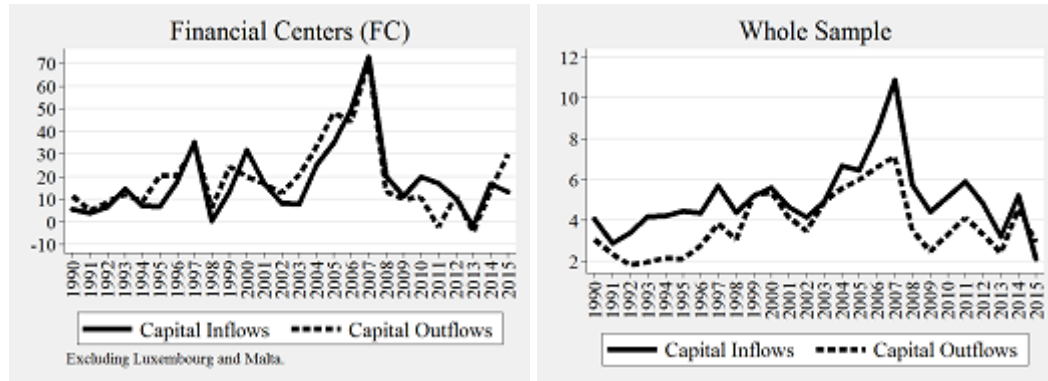
Figure 2.3: Gross Capital Flows in FC and Whole Sample

Figure 2.4 displays the behavior of aggregate capital flows in advanced (AE), emerging market[8] (EME) and developing (DE) economies. The size of capital flows (% of GDP) is substantially higher in the first half of the 2000s and peaks in 2007 for AE, EME and DE. However, the pattern of capital flows differ towards the end of 2000s. The size of capital flows begins to decrease in AE and EME, while it is substantially higher in DE (on average by 8% of their GDP) in the second half of the 2000s. In comparison to the 1990s, the size of capital flows is almost similar in EME during the 2010-2015 period and it is higher almost by three times in DE. Interestingly, the size of capital flows is substantially higher in DE than EME in 2010-2015. In comparison to EME and DE, the co-movement between capital inflows and outflows is higher in AE. Net capital flows is positive for EME and DE while it is slightly negative for AE during the almost whole sample period. Considering net capital flows is the mirror image of current account balance, positive net capital flows implies current account deficit for EME and DE while negative net capital flows indicate positive current account balance for AE. As compared to the 1990s, the size of net capital flows is lower in

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[8] The figure is similar when we exclude China from the sample of EME.
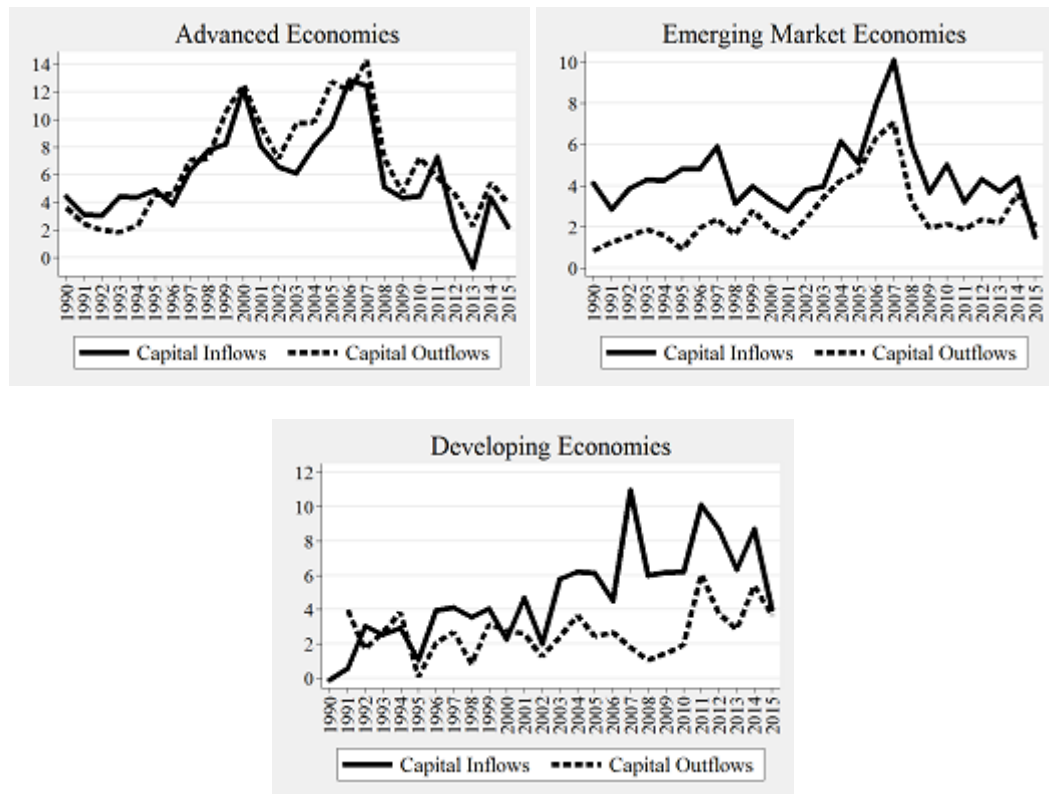
Figure 2.4: Gross Capital Flows in Advanced, Emerging and Developing Economies

EME and higher in DE during the 2000-2015 period.
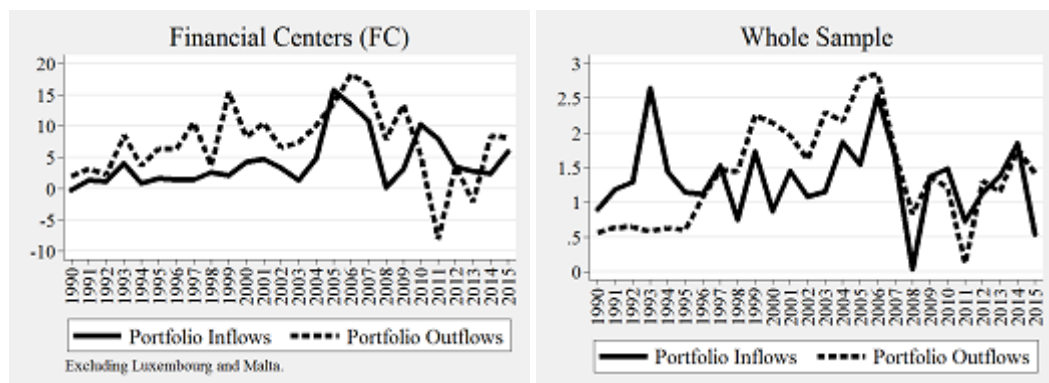
Figure 2.5: Portfolio Equity Flows in FC and Whole Sample

Figure 2.5 plots the development of portfolio equity flows in FC and whole sample. According to Figure 2.5, the positive correlation between gross capital inflows and outflows (as already presented by Figure 2.3) appears to be not case for portfolio equity flows in FC. The magnitude of portfolio equity flows is substantially higher in FC than whole sample.

Net portfolio equity flows are almost negative in FC while they are only negative during the 1997-2008 period for the whole sample.
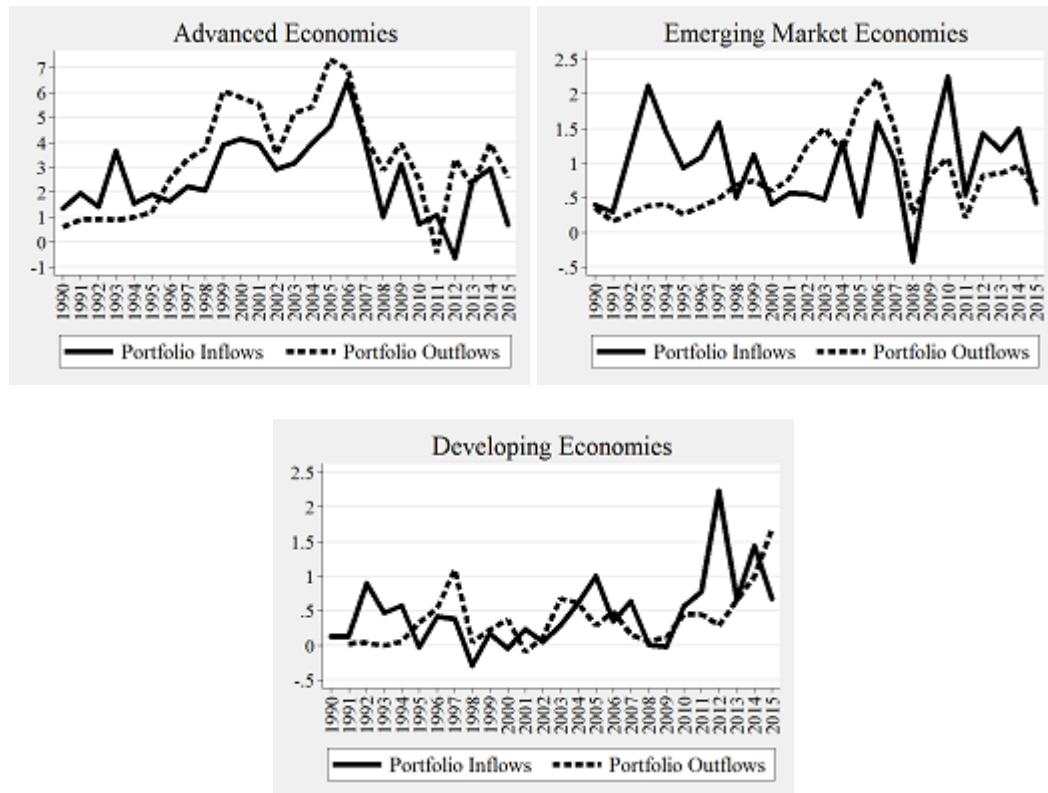
Figure 2.6: Portfolio Equity Flows in Advanced, Emerging Market and Developing Economies

The evolution of portfolio equity flows in AE, EME and DE is plotted by Figure 2.6. Portfolio equity flows increases till 2006 and then decreases in AE. For DE, the size of portfolio flows increases in the recent period. The important point in Figure 2.6 is that the size of portfolio equity flows decreases in AE, increases in DE and shows no remarkable change in EME during the period of post-recent global financial crisis. The co-movement between portfolio equity inflows and outflows appears to be the case for the whole sample. Considering net portfolio equity flows, it is negative in AE and positive in EME and DE during most of the sample period.

Figure 2.7 reports the evolution of FDI flows in FC and whole sample. The size of FDI flows (% of GDP) is substantially higher in FC. Lane (2010) explains the reason of why FC attracts high FDI flows with the choice of multinational corporations as being the main
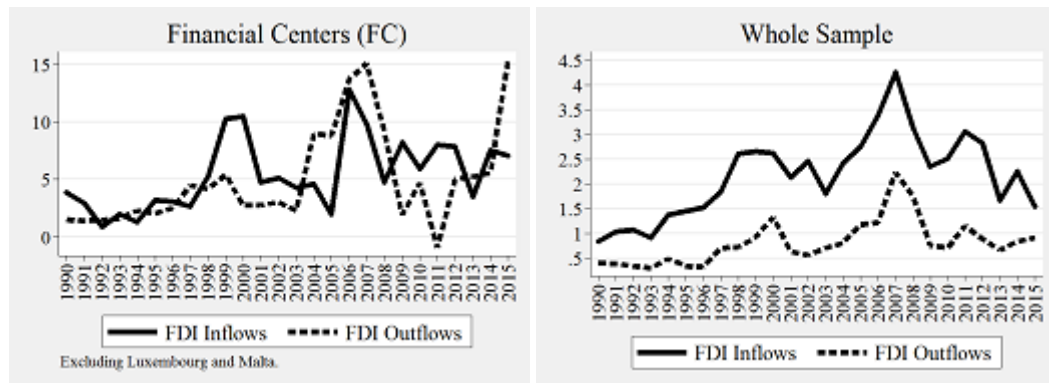
Figure 2.7: FDI Flows in FC and Whole Sample

activity center since FC facilitate specific transactions such as merger and new acquisition (Lane, 2010). Following the second half of 2000s, the magnitude of FDI flows increases in FC. Figure 2.7 shows that there is a strong co-movement between FDI inflows and outflows for whole sample. Net FDI flows is almost positive for both FC and whole sample.
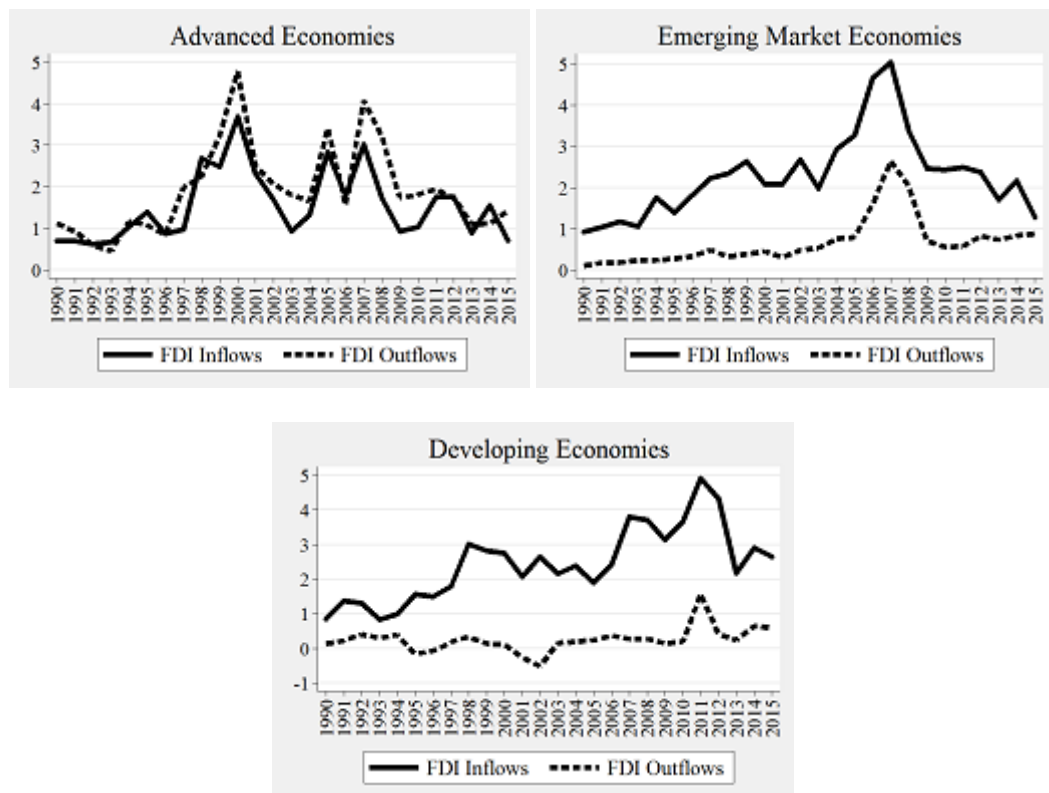
Figure 2.8: FDI Flows in Advanced, Emerging Market and Developing Economies

Figure 2.8 reports the behavior of FDI flows in AE, EME and DE. It is clear that FDI inflows dominate both in EME and DE. Even the size of FDI flows is almost similar for different groups till 2007, the pattern is different during the rest of the sample period. Following the 2007, the magnitude of FDI flows decreases in AE and EME while increases in DE. The most remarkable point in this figure is that the size of FDI flows (% of GDP) is almost same in EME and DE in the beginning of the 2000s, while it is substantially higher in DE following 2008 and then onwards. The correlation between gross FDI inflows and outflows is higher in AE. Net FDI flows is almost negative for AE while it is positive for EME and DE, albeit relatively higher in DE.

According to the economic theory, savings will flow from capital-rich countries to the capital-poor countries having a relatively higher marginal product of capital. However, Lucas (1990) suggest that the movement of capital from the rich to the poor countries is very limited (Lucas paradox) due to the political risk. Alfaro et al., (2008) report that low institutional quality (measured by the International Country Risk Guide (ICRG) rating of investment risk) as the leading explanation of the stylized fact that capital often does not flow from rich to poor countries having a highly relative marginal product of capital (Lucas paradox). Figure 2.8 suggests that Lucas paradox appears to not hold for FDI.
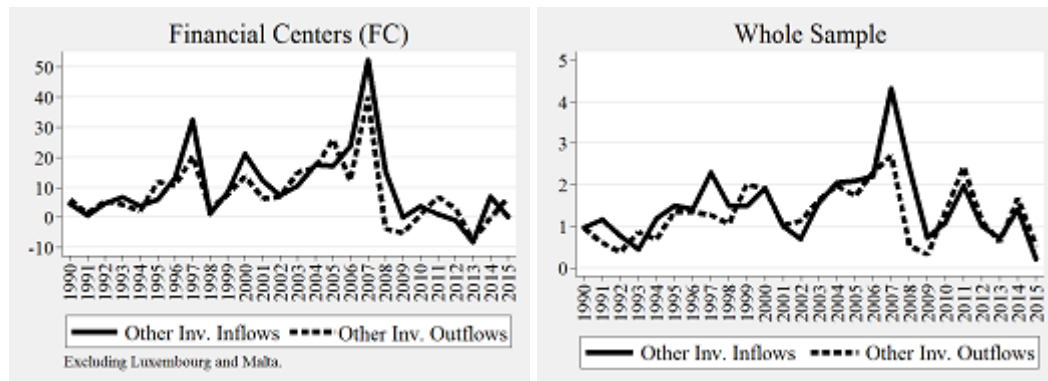
Figure 2.9: Other Investment Flows in FC and Whole Sample

Figure 2.9 shows other investment flows in FC and whole sample. Aizenman et al., (2009) and Levy-Yeyati and Zuniga (2016) suggest that other investment flows are mainly consist of bank lending. The magnitude of other investment flows (mainly banking flows) increases in both of the groups till the half of the 2000s, peaks in 2007 and decreases during

the rest of the sample period. The size of gross other investment flows is substantially higher in FC until the first half of the 2000s, although it is higher in the whole sample towards the end of the period. The co-movement between other investment inflows and outflows is higher in both of the groups. Net other investment flows is almost positive for FC and whole sample.

Figure 2.10 shows the evolution of other investment flows in AE, EME and DE. The magnitude of other investment flows increases in the all different country groups till 2007 and then decreases in AE and EME during the rest of the sample period. Following 2007, the size of the flows (% of GDP) is higher in DE than AE and EME. The correlation between other investment inflows and outflows is higher in AE. Net other investment flows is almost positive across different country groups.
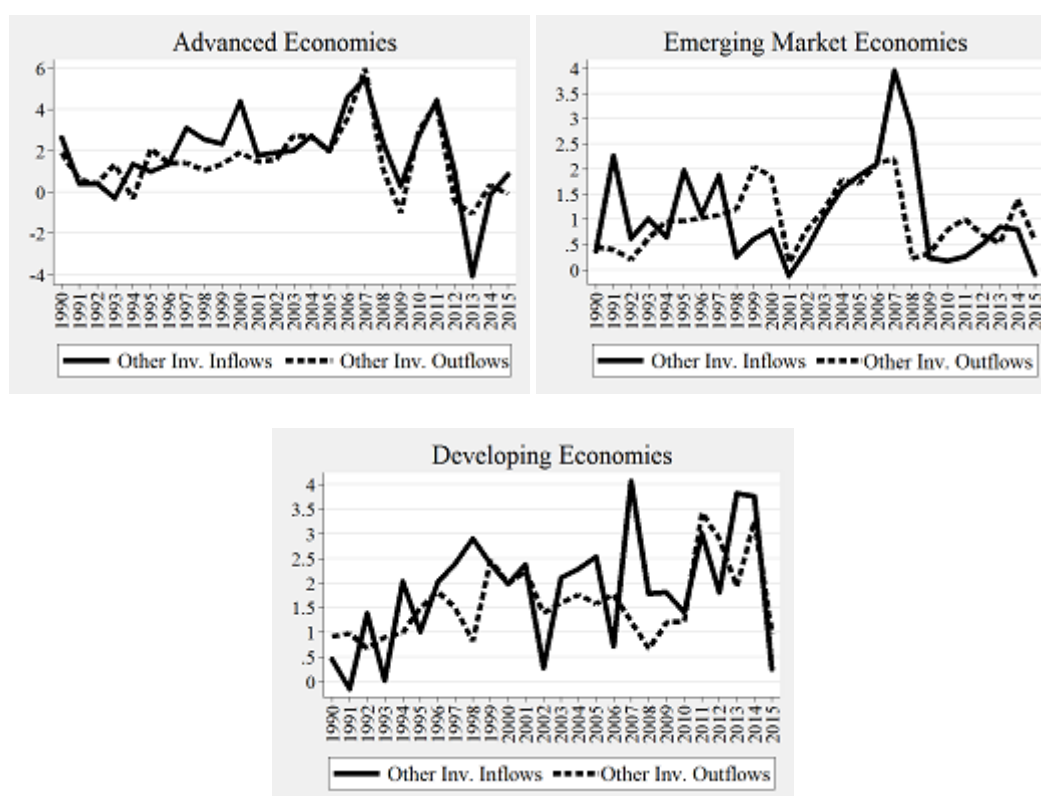
Figure 2.10: Other Investment Flows in Advanced, Emerging Market and Developing Economies

2.4.1 Capital inflows and Outflows: Are They Empirically Correlated?

The figures presented in the previous section supports the puzzling empirical results that gross capital inflows and outflows tend to move together (Broner et al., 2013 and Davis and van Wincoop, 2018). The evidence is puzzling since the conventional wisdom suggests that the correlation between capital inflows and outflows is expected to be either negative or insignificant under perfect financial markets with symmetric information, no frictions and home-bias. Recently, Özmen and Taşdemir (2018)[9] finds that such twin behaviour of capital inflows and outflows tends to be the case for the long-run. According to Özmen and Taşdemir (2018), the short-run relations, however, often appear to be consistent with the conventional theory suggesting that the behaviours of residents and non-residents do not systematically diverge from each other.

In this sub-section, we report the correlations between gross capital inflows and outflows for the whole sample, advanced, developing and emerging market economies. Following Broner et al., (2013), we explore this issue for both aggregate and disaggregate gross capital flows. To this end, we estimate Equations 2.2 and 2.3 to measure the sign and size of the relation between aggregate and disaggregate gross capital inflows and outflows during the 1990-2015 period.

$$capital\_inflows_{it} = \alpha_i + \beta_1 capital\_outflows_{it} + u_{it} \tag{2.2}$$

$$capital\_outflows_{it} = \gamma_i + \beta_2 capital\_inflows_{it} + e_{it} \tag{2.3}$$

In Equations 2.2 and 2.3, i and t refer to cross-section and time dimension of the panel, respectively. α_i in 2.2 and γ_i in 2.3 shows individual fixed effects. $capital\_inflows_{it}$ and $capital\_outflows_{it}$ show respectively capital inflows and outflows scaled by GDP for country i at time t. Instead of just looking at the correlations between gross capital flows, we prefer to employ panel fixed effect to measure both the direction and magnitude of gross capital inflows on outflows and gross capital outflows on inflows by taking into account the time-invariant country-specific variables. Apparently, the R^2 (the square of the simple correlations between

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[9] This paper is available at: http://erc.metu.edu.tr/en/system/files/menu/series18/1807.pdf

Table 2.9: Correlation Between Gross Capital Inflows and Outflows

	FC (Excluding Luxembourg and Malta)				Whole Sample			
	Dependent Variable: Inflows							
	Capital Flows	Portfolio Flows	FDI Flows	Other Inv. Flows	Capital Flows	Portfolio Flows	FDI Flows	Other Inv. Flows
β_1	0.81***	0.14	0.64**	0.69***	0.55***	0.20*	0.31***	0.42***
	(0.13)	(0.17)	(0.24)	(0.08)	(0.06)	(0.10)	(0.12)	(0.10)
R^2	0.51	0.03	0.17	0.33	0.21	0.04	0.07	0.08
NT	161	159	196	196	1505	1181	1793	1825
N	8	8	8	8	74	65	77	77
	Dependent Variable: Outflows							
β_2	0.63***	0.23	0.27***	0.47***	0.40***	0.20*	0.23***	0.20***
	(0.10)	(0.16)	(0.02)	(0.07)	(0.06)	(0.10)	(0.07)	(0.06)
R^2	0.51	0.03	0.17	0.33	0.21	0.04	0.07	0.08
NT	161	159	196	196	1505	1181	1793	1825
N	8	8	8	8	74	65	77	77

Note: $***$, $**$ and $*$ denotes significance level at 1, 5 and 10 percent significance level respectively. The values in brackets are robust standard errors, and in square brackets are p-values. NT shows the total number of observations; N shows the number of cross section units.

Table 2.10: Correlation Between Gross Capital Inflows and Outflows: AE and EMDE

	Advanced Economies				Emerging Market and Developing Economies			
	Dependent Variable: Inflows							
	Capital Flows	Portfolio Flows	FDI Flows	Other Inv. Flows	Capital Flows	Portfolio Flows	FDI Flows	Other Inv. Flows
β_1	0.52***	0.24*	0.47***	0.62***	0.53***	0.02	0.25**	0.31**
	(0.08)	(0.13)	(0.11)	(0.11)	(0.07)	(0.06)	(0.12)	(0.12)
R^2	0.31	0.07	0.29	0.27	0.17	0.00	0.04	0.04
NT	391	382	391	403	1114	799	1402	1422
N	16	16	16	16	58	49	61	61
	Dependent Variable: Outflows							
β_2	0.60***	0.30*	0.62***	0.44***	0.31***	0.01	0.15**	0.12**
	(0.08)	(0.16)	(0.11)	(0.12)	(0.06)	(0.04)	(0.07)	(0.05)
R^2	0.31	0.07	0.29	0.27	0.17	0.00	0.04	0.04
NT	391	382	391	403	1114	799	1402	1422
N	16	16	16	16	58	49	61	61

Note: $***$, $**$ and $*$ denotes significance level at 1, 5 and 10 percent significance level respectively. The values in parenthesis are robust standard errors, and in square brackets are p-values. NT shows the total number of observations; N shows the number of cross section units.

the variables) from (2.2) and (2.3) is the same, however the coefficient estimates may be helpful in interpreting whether inflows or outflows dominate in the determination of correlations.

The estimation results for the samples of financial centers (FC) and advanced economies (AE) are reported in Table 2.9[10]. For FC and whole sample, aggregate capital inflows and outflows are positively correlated, albeit considerably higher in FC. Broner et al., (2013) estimates equations similar to (2.2) and (2.3) by allowing also for different trends (country-trend dummies) across countries and finds that $\beta_1 = 0.51$ and $\beta_2 = 0.50$ for their whole sample. Our results for the whole sample (0.55 and 0.40) appear to be virtually the same with Broner et al., (2013). The positive correlation between inflows and outflows also holds for the main components of the capital flows except portfolio flows. Portfolio flows are correlated only in the whole sample. The positive correlation is the highest in other investment flows for both of the groups.

Table 2.10[11] presents the estimation results for AE and EMDE. Aggregate and disaggregate capital flows are positively correlated except portfolio flows in EMDE. Consistent with the findings of Broner et al., (2013) the correlation is substantially higher in AE than EMDE. The positive correlation implies that domestic residents increase foreign financial asset purchases/sales when foreign residents increase domestic financial asset purchases/sales. Blanchard and Acalin (2016) report that the co-movement between inflows and outflows holds even for FDI flows. Broner et al., (2013) indicates that co-movement between inflows and outflows holds during the whole period including the crisis years. This result can be sourced in the presence of asymmetric information and exchange rate risk (Tille and van Wincoop, 2014). These are the main explanations for the positive correlation between gross capital inflows and outflows. Regarding the asymmetric information, Milesi-Ferretti and Tille (2011) states that relative expected differential risk for domestic and foreign financial assets contribute to the positive relation. Broner and Ventura (2010) suggests that foreign residents consider the relative expected deterioration of property rights in the case of financial turbulence and hence they have a tendency to sell domestic assets. Tille and van Wincoop (2010) state that the

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[10] The estimated coefficients for β_1 (β_2) in Equation 2.2 (2.3) are 0.71***(0.64***), 0.41***(0.25***), 0.30***(0.21***) and 0.19***(0.56***), respectively, for capital, portfolio equity, FDI and other investment flows, when we include Luxembourg and Malta in FC. Estimation results are available upon the request.

[11] We obtain the similar results when we exclude China from EMDE sample and estimation results are available upon the request.

co-movement of saving rates also tends to be one of the reasons for the positive correlation between capital inflows and outflows. Davis and van Wincoop (2018) report that higher international financial integration is responsible for the positive relation. Özmen and Taşdemir (2018)[12] investigate the co-movement between capital inflows and outflows by employing panel error correction mechanism and find that aggregate capital flows and their main components behave differently in the short-run than long-run. Their results suggest that adjustment mechanism to deviations from the long-run equilibrium relation driven by residents (capital outflows) for emerging market economies (EME) and non-residents (capital inflows) for AE. Also, they show that capital inflows and outflows behave as twins (positively correlated) in the long-run while they are distant cousins (negatively correlated) in the short-run.

2.5 Composition of Capital Flows

In this section, we present the evolution of the composition of capital inflows and outflows for different country groups. The composition of capital flows refers to the proportion of the main components of the capital flows in the aggregate. For example, portfolio equity share corresponds to the proportion of portfolio equity flows in the aggregate capital flows. Our main aim is to discuss whether disaggregate (both gross and net) flows and the composition of flows evenly change across the years and country groups.

Figure 2.11 plots the composition of gross capital inflows and outflows in FC and whole sample during the 1990-2015 period. According to Lane and Milesi-Ferretti (2018), the group of international financial centers accounts for about half of all external assets and liabilities. This figure shows that in comparison to the 1990s, there is a considerable increase in the size of gross capital inflows and outflows up to the recent global financal crisis (GFC) of 2008-2009 reaching to almost 60% of GDP in 2007. After the GFC, on the other hand, both gross capital inflows and outflows decrease substantially. Until the GFC, other investment inflows and outflows tend to dominate capital flows in FC. The shares of portfolio equity and FDI flows appear to the same during the whole period. The decline in capital flows after the GFC is, thus, mainly the result of sharp decline in other investment inflows. Aizenman et al., (2009) and Levy-Yeyati and Zuniga (2016) state that other investment flows are mainly

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[12] You can access this paper: http://erc.metu.edu.tr/en/system/files/menu/series18/1807.pdf

consist of bank lending. Lane and Milesi-Ferretti (2018) report that the substantial decrease in capital flows after the GFC, indeed, are associated with the retrenchment of banking activities and increasing the importance of relatively less financially integrated EME and DE in world GDP. Traditionally, banks have intermediated a large proportion of cross-border debt flows (Lane & Milesi-Ferretti, 2018).
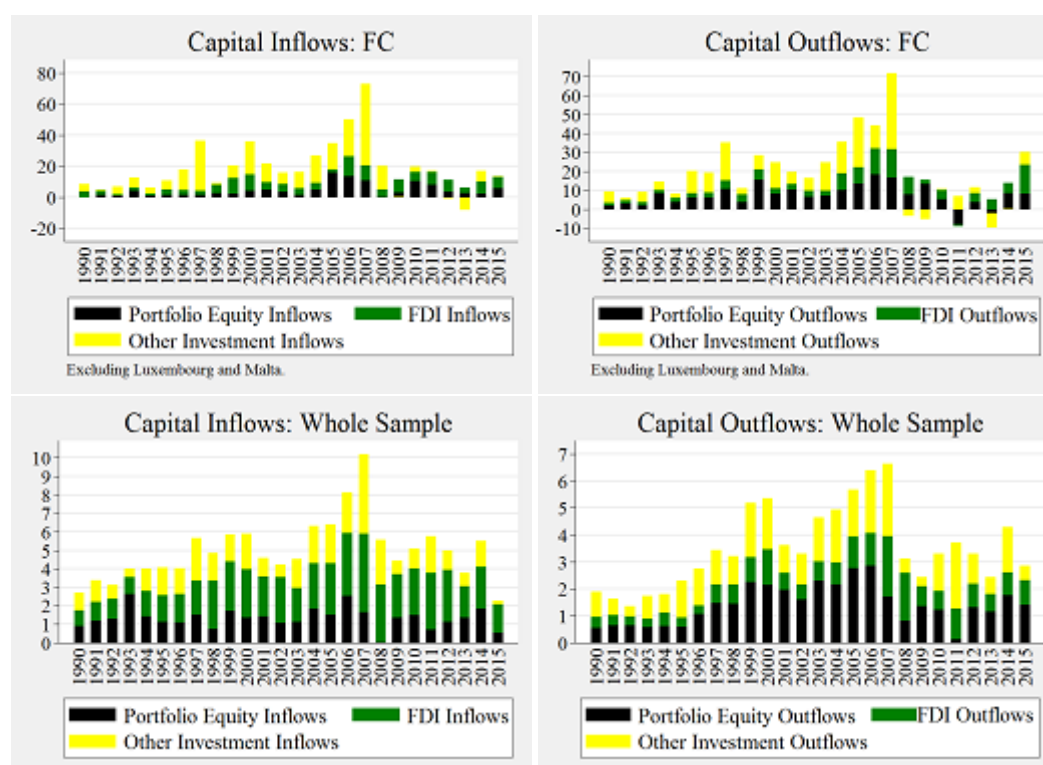
Figure 2.11: Gross Capital Inflows and Outflows: FC and Whole Sample

The composition of capital inflows and outflows in the whole sample is plotted by Figure 2.11. Both aggregate capital inflows and outflows tend to increase until the recent GFC. During the post-crisis period, on the other hand, appear to have a declining trend. For capital inflows, the size of non-FDI -portfolio equity and other investment flows- (as a percent of GDP) varies from 0.5 to 5.5 while the size of FDI inflows is relatively stable. Hence, large movements in capital inflows are mainly due to the changes in the evolution of non-FDI inflows. For capital outflows, the size of non-FDI outflows varies from 1% to 5% (of GDP) and resulting substantial changes in capital outflows. Considering the composition of capital inflows, it is clear that the share of FDI inflows is the highest during the whole period. The share of portfolio equity flows is the highest during the 1990-2007 period and it is the other

investment flows during the rest of the period. Thus, the composition of capital outflows changes from portfolio equity to other investment while there is no remarkable change in the composition of capital inflows. From the observation in Figure 2.11, we can say that foreign residents prefer to invest in long-term financial assets while domestic residents prefer to invest in short-term financial assets.
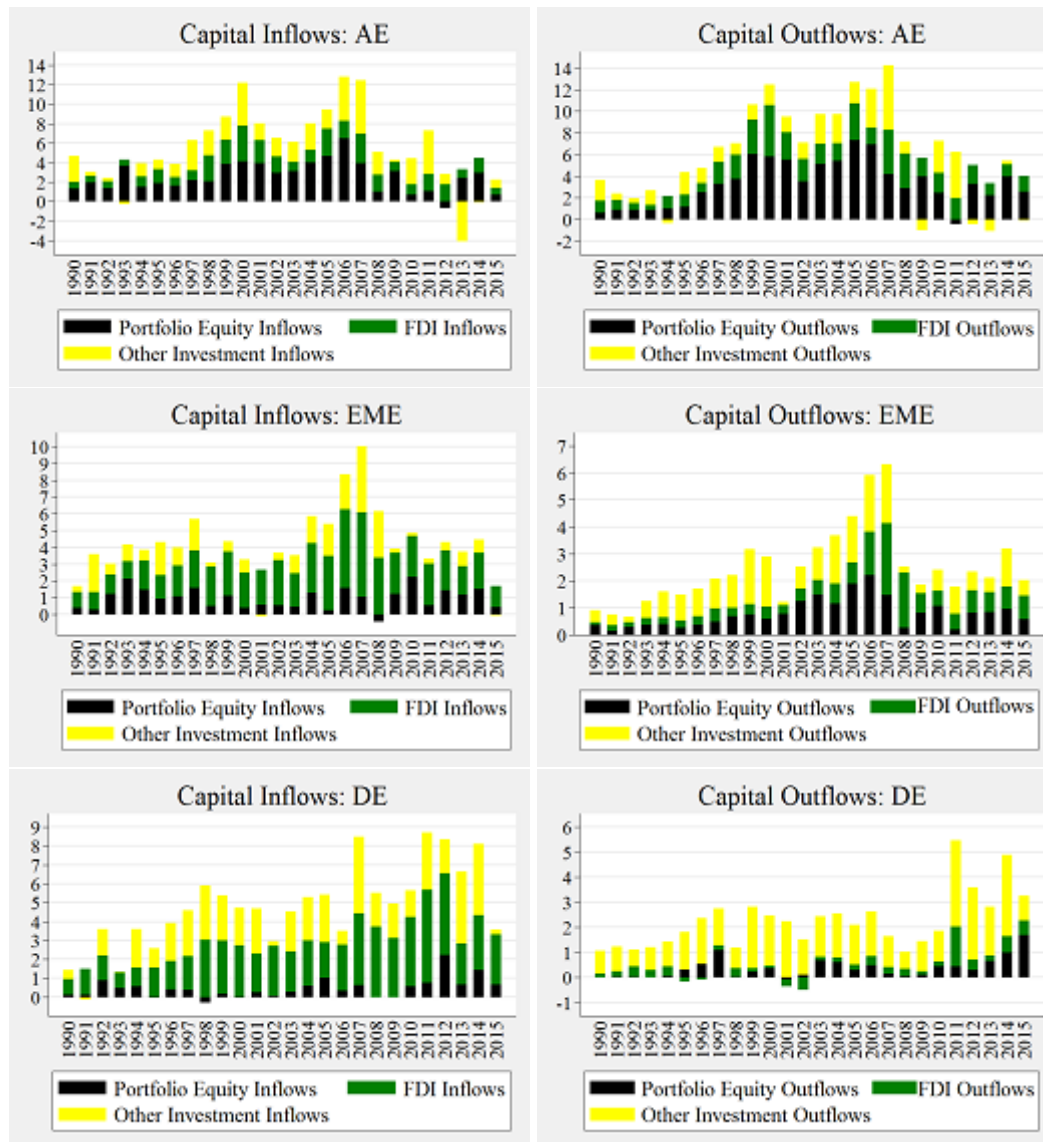
Figure 2.12: Gross Capital Inflows and Outflows: AE, EME and DE

Figure 2.12 presents the composition of capital inflows and outflows in AE, EME and DE. According to the Figure 2.12, the share of non-FDI flows (as a % of GDP) varies from 2% to 10% and leading to a rapid increase in both capital inflows and outflows during the

pre-GFC period of 1990-2007. In post-GFC period of 2008-2015, the magnitude of non-FDI flows varies from 2% to 4% and resulting a substantial decrease in capital flows. The share of portfolio equity flows is relatively higher both in inflows and outflows during the almost all sample period. For AE, the composition of capital flows does not change substantially during the whole period. The figure supports an interpretation that domestic and foreign residents prefer to invest in short-term financial assets such as portfolio equity during the period.

The picture for emerging market economies (EME), as plotted by Figure 2.12, however, appears to be much different from that of advanced economies. For EME, FDI inflows tends to be much higher then the other inflows. The size of FDI inflows (% of GDP) increases just around only 1% in the early 1990s to about 5% just before the GFC. The share of other investment inflows tends to on an increasing trend before the GFC and remains to be modest after the crisis. Considering capital outflows, other investment share is comparatively higher until 2007 while it is the FDI during the rest of the sample period. The composition of capital outflows changes from other investment to FDI while the composition of inflows does not change. Other investment outflows constitute almost a half of the gross outflows during the years before the GFC. The sharp decline in the other investment inflows after the crisis may be interpreted as the basic reason of the decline in capital outflows after the GFC. For EME, foreign residents seems to invest in long-term financial assets whilst domestic residents preferences changes from investing in short-term financial assets to long-term assets.

The developing economies (DE) are often classified in the context of their integration to international financial markets. Consequently, DE may be expected to have much less capital flows compared to EME. Figure 2.12, on the other hand, suggests that the difference is not, indeed, substantial especially for FDI and other investment inflows. The behaviour of portfolio inflows, however, which is almost negligible, seems to be consistent with the classification of these countries as DE. The share of FDI is relatively higher in capital inflows and other investment is substantially higher in outflows during the all period. The composition of capital inflows and outflows in DE is substantially much different from the other country groupings including EME. FDI inflows constitute more than half of the aggregate capital inflows during most of the sample period. This is followed by other investment inflows. Contrasting with the evidence for AE and DE samples, we do not observe a sharp decline in capital inflows even after the GFC. For DE, the composition of capital flows does not change

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and we can assert that foreign residents prefer to invest in long-term assets while domestic residents prefer to invest in short-term financial assets. Another remarkable difference for the DE sample is the evoution of capital outflows. Consistent with the picture for inflows, capital outflows do not exhibit a decreasing trend after the GFC. On the contrary, aggregate capital outflows tend to increase after the GFC. Other investment outflows apperantly dominate over the rest of the outflows in DE.
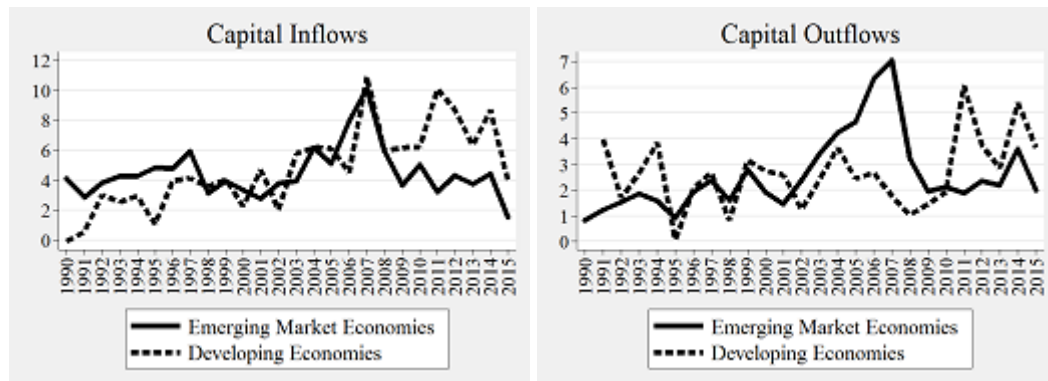
Figure 2.13: Capital Inflows and Outflows: EME and DE

The evolution of capital inflows and outflows in EME and DE is plotted by Figure 2.13. Capital inflows and outflows in EME and DE tend to move together until the recent global financial crisis (GFC). After the crisis, capital inflows decrease in both of these country groups but the decline is much substantial in EME. Before the GFC, especially during the first half of the 2000s, capital outflows exhibit a strong upward trend in EME. After the crisis, capital outflows decline sharply. On the contrary, capital outflows tend to increase after the GFC in DE.

The composition of capital inflows and outflows in East Asia and Pacific and Latin America and Caribbean is plotted by Figures 2.14 and 2.15. Our country classification is based on the geographic region classification of World Bank, 2017. The East Asia and Pacific[13] case is plotted by Figure 2.14. The size of capital inflows is approximately 4% and outflows is about 2% of their GDP in 1990-2015. The change in FDI share leads to a gradual increase in inflows during the initial years of the 2000s and a substantial decrease towards the end of the sample period. On the contrary to the recent slowdown in capital inflows, the size

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[13] Countries in East Asia and Pacific regions are Australia, Indonesia, Japan, Korea R., Malaysia, Mongolia, New Zealand, Philippines and Thailand.

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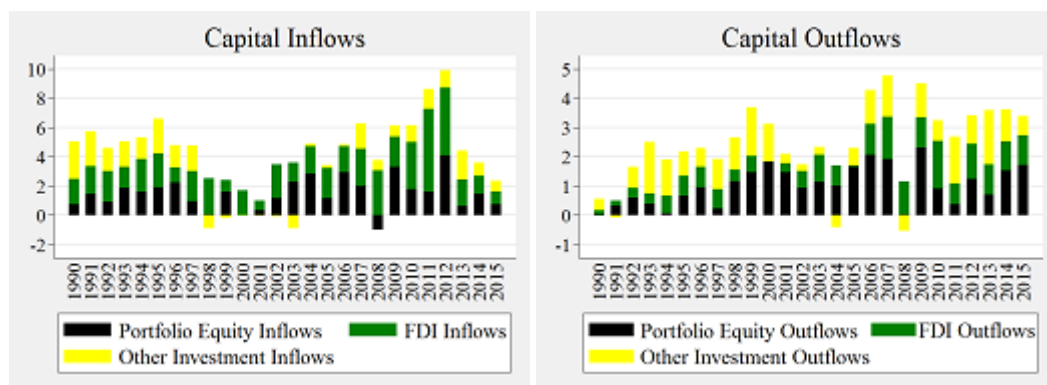
Figure 2.14: Gross Capital Inflows and Outflows: East Asia and Pacific

of capital outflows is relatively stable and it is almost 2% in 1990-2004 and 3% in 2005-2015. In general, the size of inflows is higher than outflows implying that net capital flows are almost positive for East Asia and Pacific region. The share of FDI inflows is relatively higher in capital inflows and other investment share is comparatively higher in outflows during the almost all sample period. For East Asia and Pacific region, the composition of flows does not change and we can indicate that foreign residents consider investing in long-term assets while domestic residents prefer mostly short-term financial investment.
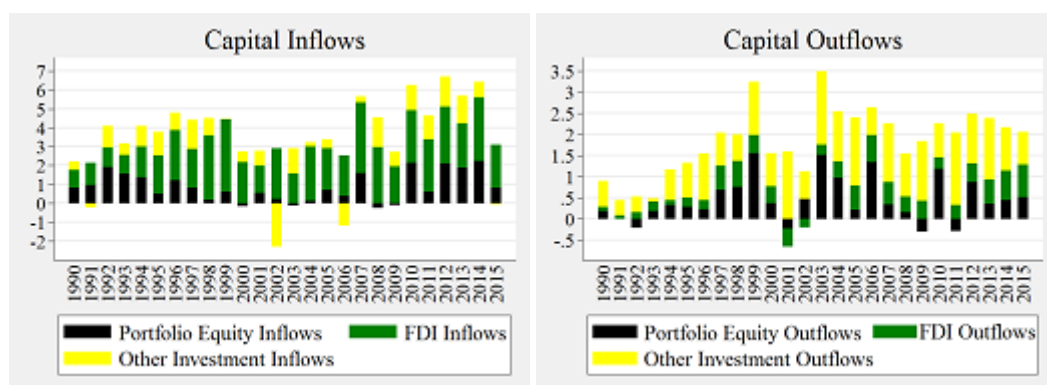
Figure 2.15: Gross Capital Inflows and Outflows: Latin America and Caribbean

Figure 2.15 shows the composition of capital flows in Latin America and Caribbean[14]. Similar to the East Asia and Pacific, capital inflows appear to be almost the twice of the capital outflows in Latin America and Caribbean. FDI inflows tend to much higher than the

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[14] Countries in Latin America and Caribbean region are Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Peru, Uruguay and Venezuela.

other components. The share of other investment inflows seems to be stable around 2% of GDP. Around half of the aggregate outflows is other investment flows. The shares of FDI and portfolio equity inflows are roughly equal to each other and they may be interpreted as relatively stable during the period. We shall also note that, foreign and domestic residents, respectively, consider invest in long-term and short-term financial assets.

2.5.1 Net Capital Flows

Along with gross flows, net capital flows (gross inflows-gross outflows), as also roughly being the mirror image of current account balance (by ignoring reserve assets), are also important determinants of growth and stability especially in EME and DE. Figure 2.16 plots net capital inflows and their main components for AE, DE and EME. Figure 2.16 shows the composition of net capital flows in AE, EME and DE and suggesting net portfolio equity and FDI flows are almost positive while net other investment flows are negative in some years for EME and DE. The evaluation of compositional net capital flows suggests that the share of net portfolio equity flows is higher in AE and net FDI flows is higher in EME and DE. Figure 2.17 presents aggregate net capital flows for AE, EME and DE. Net capital inflows tend to be negative, corresponding to current account surplus, during most of the period in AE. Negative net portfolio inflows seem to be the basic determinant of this pattern. The net capital inflows are positive, implying current account deficits, for both DE and EME. The net capital flows are relatively higher in DE than in EME and AE.

According to the Figures 2.16 and 2.17, net capital inflows and thus current account balances are relatively stable for the EME sample. For DE, on the other hand, there is a substantial increase in net capital inflows and current account deficits after the global financial crisis (GFC). This is consistent with a view that, the unconventional monetary policies including zero lower bound for interest rates and quantitative easining leading to ample global liquidity have led EME and especially DE to sustain current account deficits. Net positive FDI flows appear to be driving the positive net capital inflows in EME and DE. Consequently, current account deficits in these groups of countries tend to be mainly financed by net FDI inflows. This may, indeed, be interpreted as good news for both the sustainability of current account deficits and thus financial stability and growth in EME and DE.
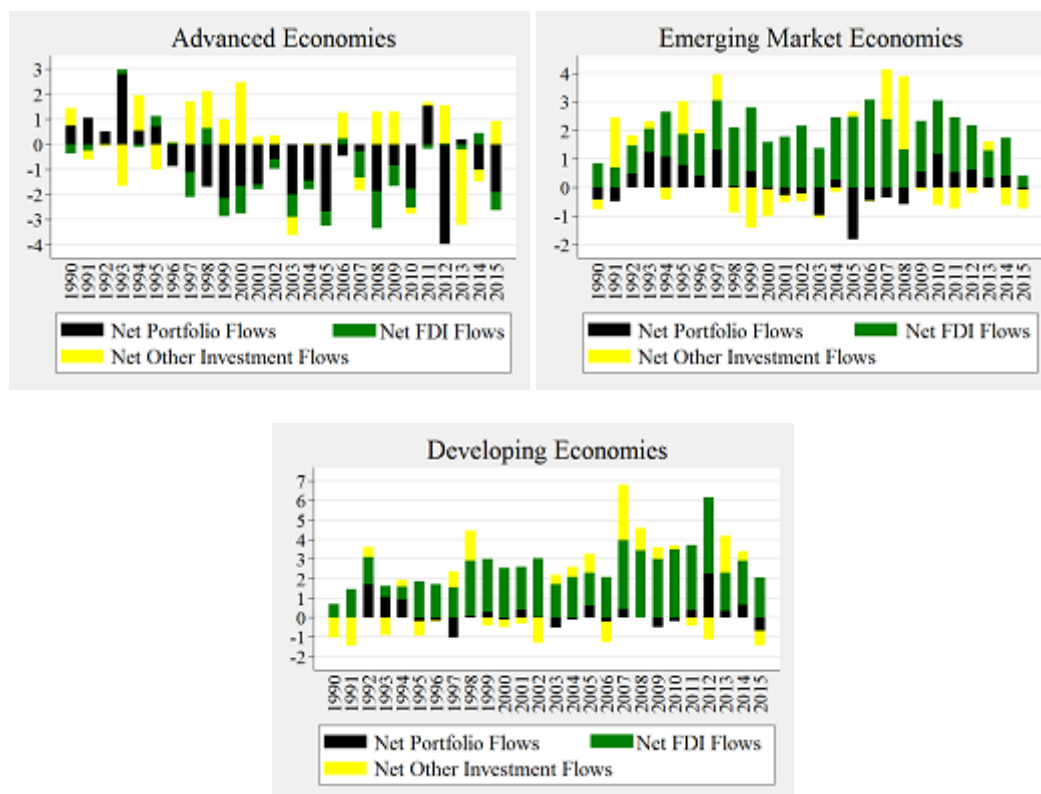
Figure 2.16: Net Capital Flows in Advanced, Emerging Market and Developing Economies

The conventional economic theory suggests that savings will flow from capital-rich countries to the capital-poor countries, i.e. downhill flow of capital. However, Lucas (1990) reports that, in contrast to the implications of theory, the movement of capital from capital-rich to the capital-poor is relatively limited due to the political risk (Lucas 1990). Consistent with Lucas implying uphill flow of capital, Prasad et al., (2007) find that growth and foreign capital are positively correlated in industrial countries while this is not the case for non-industrial countries because their limited ability of absorbing foreign capital. Also, Alfaro et al., (2008) state that the low institutional quality leads to uphill flow of capital. Gourinchas et al., (2013) find that capital does not move to the high productivity countries even within the emerging market and developing economies. Boz et al., (2017) report that uphill flow of capital expanded in 2000-2008 and it is contracted and reversed in 2009-2016 period. Considering the accounting identity that net capital inflows (ignoring reserve assets) are the mirror image of current account balance, the evidence provided by Figures 2.16 and 2.17 may be interpreted as suggesting that savings flow from AE to EME and DE, i.e. downhill flow.
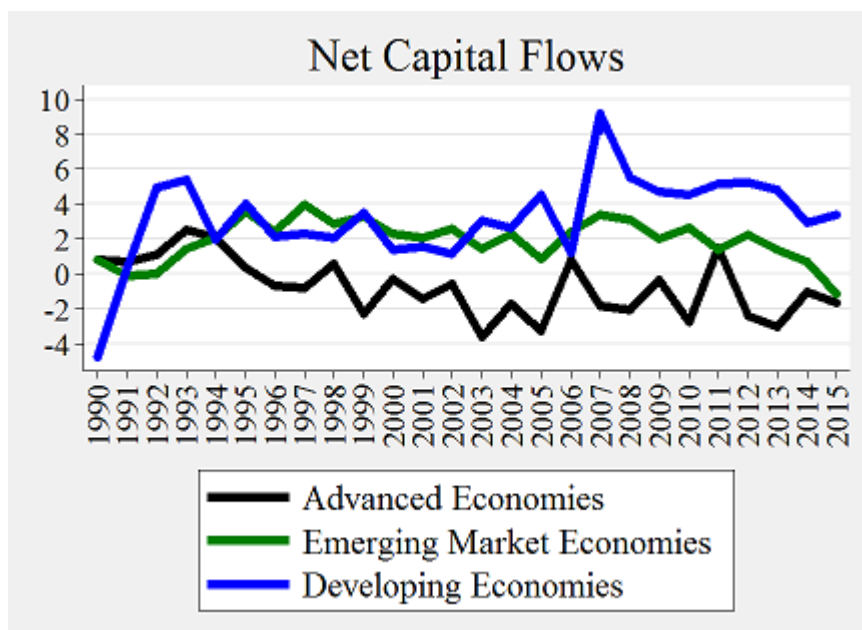
Figure 2.17: Net Capital Flows in Advanced, Emerging Market and Developing Economies

2.6 Main Findings and Concluding Notes

International capital flows and thus, international financial integration have been considerably increased especially during the recent decades. In this period, many emerging market economies have much more integrated to international financial markets by lessening the restrictions on capital flows. All these along with the recent increase in financial integration has led capital flows to be amongst to be much more important topic in the international macroeconomics literature. In this context, this chapter reports the stylised facts about international capital flows and their main components for advanced, emerging market and developing economies. Consistent with the recent studies, we mainly consider the behaviors of gross capital flows and their main components (portfolio equity, FDI and banking flows). This chapter also provides the definition, measurement and evolution of capital flows in order to construct a basis for the following chapters.

We first consider the international financial integration (IFI) measure based on the "External Wealth of Nations" dataset of Lane and Milesi-Ferretti (2018). We observe that international financial integration tends to increase in all country groupings, albeit the growth

of IFI is relatively lower in the post global financial crisis (GFC) period. International financial integration measured as the sum of gross financial assets and liabilities (as a % of GDP in current US dollars) has doubled (from around 10% to 22%, our calculations) in the whole sample of countries (excluding financial centers) from 1990 to 2015. This increase tends to be striking in financial centers (from 40% to 250%) and advanced economies (10% to 45%). Emerging market and developing economies (EMDE) have also experienced substantial increases (from around 8% to 16%) in international financial integration during this period.

We find that mean capital flows increases in the pre-GFC period and decreases in the post-GFC period. As compared to emerging market and developing economies, the increase and decrease in mean capital flows are substantial in advanced economies. This finding suggests that there is a global excess liquidity in the pre-GFC period whilst there is a global retrenchment during the post-GFC period. Aggregate capital inflows and outflows tend to increase during the 1990-2007 period in advanced economies (AE) but substantially decreases after the global financial crisis (GFC) of 2007-2008 in AE. The increase in capital inflows during the 1990-2007 period is relatively modest in EMDE. Similar to the AE case, capital outflows substantially decrease after the GFC in EMDE. Thanks to the unconventional monetary and quantitative easining policies in AE, capital inflows to the EMDE almost remains the same after the GFC. Compared to the 2000-2007 period ample global liquidity, FDI inflows and outflows sizeable decreases in after the GFC in AE. We do not observe a considerable change in FDI inflows and outflows in EMDE after the GFC. For the evolution of portfolio equity and other investment flows, we observe similar dynamics with FDI flows both in the AE and EMDE samples. On the other hand, we find that the volatility of capital inflows (driven by foreign residents) is higher than outflows (determined by domestic residents) in advanced economies whilst the volatility of outflows is higher than inflows in emerging market and developing economies. In all country groupings, supporting the findings of Eichengreen et al., (2018), FDI flows are found to be more stable compared to other components of capital flows. In this chapter, we provide some evidence that Lucas paradox i.e. uphill flow of capital does not appear to hold for FDI flows.

Finally, this chapter also considers a recent important empirical puzzle that capital inflows and outflows move together. This is a puzzle since under perfect financial markets, the portfolio choices of residents and non-residents may be expected not to systematically

diverge from each other and thus, the correlation between capital inflows and outflows may be expected to be negative or statistically insignificant at best. The recent literature including Broner et al., (2013) and Özmen and Taşdemir (2018) suggest that, however, this appears not to be the case.

CHAPTER 3

THE DETERMINANTS OF CAPITAL FLOWS

International capital flows have often been interpreted as crucially important for growth and financial stability in emerging market (EME), developing (DE) and advanced economies (AE). As presented by Chapter 2, international capital flows and consequently international financial integration have been substantially increased in EME, DE and AE during the recent decades. Consequently, investigating the main determinants of capital flows has become much more important and topical in international macroeconomics literature and economic policy. In this chapter, we investigate the main determinants of capital flows.

The recent literature investigates the determinants of capital flows within the country-specific (pull) and global (push) factors context thanks to the seminal contributions of Calvo et al., (1993) and Fernandez-Arias (1996). "Pull" factors are mainly the variables denoting the domestic macroeconomic and institutional environments. Pull factors consist of a wide range of factors like growth, financial and trade openness, institutional quality and domestic macroeconomic policies. "Push" factors are basically the variables representing the global financial conditions and monetary policies in the AEs. Following the literature, we will investigate the determinants of capital flows within the pull and push factors framework.

Until recently the bulk of the literature has often investigated the behavior of net capital flows which is indeed the mirror image of the negative of the current account balance. Broner et al., (2013) suggest that gross flows are much larger and more volatile than net flows and the analysis of gross flows is more relevant for growth and financial stability issues (Forbes & Warnock, 2012; Ghosh et al., 2014, Koepke 2019). Furthermore, the literature often studies aggregate flows and ignores their main components. As suggested by Blanchard et al., (2017), Igan et al., (2017) and Eichengreen et al., (2018), the investigation of determinants and consequences of the main components of capital flows as important as the aggregate flows. Also,

Koepke (2019) suggests that even most of the flows are between the AEs, the stability concern matters mostly for EME. Therefore, this chapter mainly explains the drivers of gross capital inflows and main components in EME.

The literature often considers structural domestic conditions including *de facto* exchange rate regimes, institutional quality including political rights and civil liberties, financial development and openness to international trade as important determinants of capital flows. In this chapter, we first investigate whether such domestic structural factors along with the pull and push factors are important in the evolution of gross capital inflows and their main components for EME. This analysis is important especially for policy makers since a result about the importance of country-specific domestic pull and global factors in driving capital inflows has very important policy implications. We determine the factors that drive capital flows and these factors arise from either the change in the global or country-specific factors, or both. If capital flows are mainly explained by the push factors, then countries may be expected to be vulnerable to exogenous shocks and, consequently, they may be having limited domestic policy actions. On the other hand, if capital flows driven by pull factors, then countries may be interpreted as to have much more domestic policy options to improve both capital inflows and the potential benefits from them. Another important contribution of this chapter is that we investigate whether the impacts of the main pull and push factors change across the prevailing exchange rate regimes (ERR) in explaining the determinants of capital inflows. This analysis is also important since it measures whether the impacts of global and country-specific factors differ with respect to the choice of ERR and in this sense, it discusses whether the choice of ERR matters for the determinants of capital flows.

The plan of the rest of the chapter is as follows. Section 3.1 briefly reviews the literature on the determinants of capital flows. In Section 3.2, we investigate whether structural domestic conditions such as institutional quality represented by freedom (political rights and civil liberties), financial development and openness to international trade are significant drivers of capital inflows in EME. This section considers also the potential endogeneity of domestic variables. This issue is tackled by the implementation of two step generalized methods of moments (GMM) dynamic panel estimation procedure. Section 3.3, investigates whether the prevailing *de facto* ERR is important in the evolution of gross capital inflows and their main components for EME. The bulk of the literature often ignores the integration and co-

integration of the variables in investigating capital flows. To this end, Section 3.3.1 applies fully-modified OLS (FM-OLS) procedure of Phillips and Hansen (1990) and Pedroni (2001) which incorporates a semi-parametric correction to the OLS estimator to eliminate the potential heterogeneity in the long-run relationship along with endogeneity and serial correlation. Section 3.3.2 considers panel threshold estimation procedure of Hansen (1999) to investigate whether ERR provide endogenous thresholds for the impacts of the main determinants of the capital inflows. Finally, Section 3.4, presents our main concluding notes.

3.1   The Drivers of Capital Flows: A Brief Review of the Literature

A pioneering study by Calvo et al., (1993) investigates the causes of large increase in capital flows to Latin America in the early 1990s. Their results strongly support that decreases in interest rates and lower growth rate of the United States are important external factors that drive capital flows to Latin America. Beside of these favorable external factors, Latin American countries introduce basic economic and political reforms that create a favorable domestic environment for foreign investors. At this point, Calvo et al., (1993) asks that whether the causes of these flows have been associated with improved domestic environment or favorable external factors. To the best of our knowledge, this is the first paper that indicate the importance of external factors in explaining the causes of capital flows. Fernandez-Arias (1996) states that credibility of developing countries are often determined also by external factors and, consequently, most of the capital inflows to developing countries are driven by external factors rather than domestic conditions. Taylor and Sarno (1997) investigates the drivers of portfolio flows and finds that portfolio flows are explained with the pull and push factors, albeit the importance of push factors is higher than pull factors.

Ghosh and Ostry (1993) find that capital inflows to developing countries are closely related to the country-specific conditions. Chuhan et al., (1998) also find that domestic pull factors are as important as push factors in explaining the drivers of portfolio equity flows. The studies of Calvo et al., (1993), Ghosh and Ostry (1993), Fernandez-Arias (1996), Taylor and Sarno (1997) and Chuhan et al., (1998) have all been played a pioneering role in explaining the drivers of capital flows within the pull-push framework which provide an important starting point for the bulk of the recent literature.

Ahmed and Zlate (2014) investigates the determinants of net capital flows in EMEs and find that growth and interest rate differentials between EMEs and AEs and global risk appetite are important drivers of net capital flows. The results by Byrne and Fiess (2016) suggest that AEs long-run bond yields and commodity prices determine whether capital moves to the EMEs and financial openness and institutions determine whether EMEs attract capital inflows. Also, the authors emphasize that higher financial openness and stronger institutions are important for EMEs to reap the potential gains from financial globalization. Cerutti et al., (2017) suggests that financial market depth and higher exposure to "fickle investors" drive capital flows to EMs and these factors are more important than good institutional and macroeconomic fundamentals. Pagliari and Hannan (2017) find that push factors are more important than pull factors in explaining the drivers of capital flows volatility. The results by Sarno et al., (2016) and Boero et al., (2019) suggest that global push factors are more important than country-specific pull factors in explaining the drivers of portfolio flows.

The recent literature also considers whether the main drivers of capital flows are the same before, during and after the recent global financial crisis (GFC). For instance, Fratzcher (2012) compares the drivers of portfolio flows during crisis and recovery periods. The results by Fratzcher (2012) support the postulation that push factors drive the portfolio flows during the crisis while pull factors explain the portfolio flows in the recovery period. The results by Broner et al., (2013) suggest that gross capital flows are pro-cyclical indicating that capital inflows and outflows increase in expansions and they decrease in crises. Consistent with the findings by Broner et al., (2013), Kaminsky et al., (2004) report that the reinforcement among the macroeconomic policy and capital inflows cycle leads to the "when it rains, it pours" symptom. Cavallaro and Cutrini (2018) report that global volatility leads to higher demand for institutional quality and the sensitivity of global liquidity conditions to institutional quality differs across the pre- and post-crisis periods.

The literature contains also studies investigating the extreme movements[1] in capital flows. Forbes and Warnock (2012) studies the extreme movements in gross capital flows and find that global factors are important during each of the episodes. Ghosh et al., (2014)

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[1] Extreme movements in capital flows correspond to the surge, stop, retrenchment and flight episodes. Surge (stop) represents the sharp increase (decrease) in gross capital inflows and flight (retrenchment) denotes the sudden increase (decrease) in gross capital outflows.

suggests that global factors determine whether the EME experience large capital inflows and country-specific domestic factors determine the size of inflows. Also, the authors state that the sensitivity of capital inflows to global factors is higher than outflows. Eichengreen et al., (2016) find that global push factors are more important than country-specific pull factors in determining the sharp decrease in capital inflows. Calderón and Kubota (2019) investigate the determinants of surge episodes and find that pull factors such as stronger growth and natural resource abundance explains the surge episodes and worsening global financial conditions indicates the end of the surges.

An influential study by Mirando-Agrippino and Rey (2012) finds that VIX index (Chicago Board Options Exchange's equity option volatility and uncertainty index) represents risk appetite and the world market volatility of traded risky assets. According to Mirando-Agrippino and Rey (2015), the VIX index proxies global financial cycle which is closely associated with capital flows, credit growth and asset prices. Eichengreen and Gupta (2016); González et al., (2008) and Özatay et al., (2009) report that VIX contains information about the global risk aversion and global liquidity conditions. Rey (2016) finds that VIX is negatively associated with capital inflows, except FDI inflows.

Cerutti et al., (2017), on the other hand, suggest that global financial cycle proxied by VIX explains a little movement in capital flows. Amiti et al., (2018) suggests that the impact of global factors on capital flows varies across the years and finds that bank flows driven by common global factors only in non-crisis periods. Ahmed et al., (2017) finds that better economic fundamentals provides insulation from the financial turbulence. The findings by Avdjiev et al., (2018) suggest that capital flows and their main components are negatively associated with VIX and positively related with GDP growth for EMEs. Eichengreen et al., (2018) finds that portfolio flows are explained mainly by external push factors, FDI flows are determined mainly by the country-specific pull factors and other investment flows are driven by both external push and country-specific pull factors. The results by Özmen and Taşdemir (2019)[2] provide a support for the main findings of Eichengreen et al., (2018).

The literature suggests that structural domestic conditions including trade openness, financial market depth and freedom are important in explaining capital inflows to EMEs.

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[2] This paper is available at: http://erc.metu.edu.tr/en/system/files/menu/series19/1902.pdf

For instance, Dunning and Zhang (2008) postulates that natural and human resource endowments along with institutional quality, the degree of trade openness and economic development provide location advantages to the host economies. The theoretical results by Davis and van Wincoop (2018) suggest that higher trade openness reduces the correlation between gross capital inflows and outflows while *de facto* financial globalization increases the correlation between inflows and outflows. According to the Heckscher-Ohlin-Mundell framework, trade integration decreases the incentives for capital to flow capital-scarce economies. On the contrary to the implications of Heckscher-Ohlin-Mundell suggesting substitutionary relation between trade integration and capital mobility, Antras and Caballero (2009) report that the relation between capital mobility and trade integration can be complementary in the presence of financial frictions. Cerutti et al., (2017) find that the sensitivity of portfolio bond flows to global financial conditions is higher in more open economies. Özmen and Taşdemir (2019) find that higher level of trade openness considerably increases the sensitivity of capital flows to pull factor. Schumpeter (1911) suggest that financial development and better financial intermediation are important determinants of economic growth. Levine (1997) report that financial development promotes investment and economic growth by facilitating better productive allocation of resources and risk diversification. Alfaro et al., (2009) and Azman-Saini et al., (2010) suggest that financial development is an important precondition for augmenting a positive impact of FDI on economic development. Hermes and Lensink (2003), Hussain and Kimuli (2012) also emphasize the importance of financial development as an indicator for productivity growth, dissemination of foreign technology and accumulation of capital. Bengoa and Sanchez-Robles (2003) state that countries that have high levels of freedom has been more attractive to foreign investors. Kapuira-Foreman (2007) find that the presence of economic freedom results with higher FDI flows. Dutta and Roy-Kyklos (2010) report that higher level of FDI inflows promotes the media freedom.

Montiel (2014) suggests that improvement in institutional environment along with policies that favor more financial openness lead to the higher capital flows episodes by mainly increasing the exposure to external push and country-specific pull factors. In this vein, Alfaro et al., (2008) finds that institutional quality plays a crucially important role in explaining the Lucas paradox. Ghosh et al., (2014) finds that surge episodes are more apparent in financially more open and better institutional environment EMEs. In the same vein, Bryne and Fiess

(2016) reports that financial openness and institutional environment have crucial importance for explaining capital inflows to EMEs. According to Eichengreen et al., (2018) better investment climate leads to more FDI inflows whilst this appears not to be the case for non-FDI inflows. Özmen and Taşdemir (2019) find that the impacts of external push and domestic pull factors differ across the endogenously determined threshold levels like institutional quality, *de jure* and *de facto* financial openness and *de facto* trade openness in explaining the determinants of capital flows. They find that the impact of domestic pull factor is higher in more open, financially integrated and better institutional environment economies.

The conventional wisdom suggests that credible managed exchange rate regimes (ERR) allow countries to import monetary policy credibility (and hence lower inflation) of the anchor currency country, reduce transaction costs and provide exchange rate guarantee and thus, it is expected that capital flows will be higher in credible managed ERRs (Rogoff et al., 2004). On the other hand, ERR flexibility extends the monetary policy tools as indicated by trilemma in international macroeconomics. In this vein, Edwards (2011) reports evidence that ERR flexibility allows countries to reconcile external shocks. Consequently, the results by di Giovanni et al., (2008) indicate that impacts of external shocks are magnified in more rigid ERRs. Similarly, Erdem and Özmen (2015) find that the impacts of external real and financial shocks and domestic variables are significantly larger in managed ERRs as compared to floats.

The recent empirical literature presents mixed and conflicting results on the impact of ERR on capital inflows. For example, Magud et al., (2014) and Boudias (2015) find that exchange rate regime flexibility does not affect the evolution of capital flows in emerging market economies. Passari and Rey (2015) state that the insulation effects of floating ERRs may have been overestimated. Aizenman et al., (2016) find that the impact of center economies' monetary policy changes on financial development in the periphery countries varies by depending on the ERR and it is higher in more flexible ERRs. Cerutti et al., (2017) report that the impacts of global financial cycle are independent of the prevailing ERRs in explaining the causes of capital flows. However, Cerutti et al., (2017) suggest that the impact of global push factors on portfolio bond inflows is higher in emerging market economies with more flexible ERRs. Obstfeld et al., (2018) provides that the transmission of global financial shocks and domestic pull factors are magnified under a fixed ERR relative to more flexible regimes in emerging market economies. Barrot and Serven (2018) and Lafuerza and Serven (2019) find

that the impact of global financial conditions on capital flows is higher in more financially open and less flexible ERRs. Ghosh et al., (2014) and Calderon and Kubota (2019) indicate that countries with less flexible ERRs are more likely to experience surge episodes. Ghosh et al., (2015) report that macroeconomic and financial vulnerabilities are lower in more flexible ERRs. Davis and Zlate (2019) state that more open and floating ERR prevailing countries partially connect domestic monetary policy to the base country's policy. Carvalho (2019) suggests that capital flows and domestic money holdings are correlated in floating ERRs. Wei (2018) indicates that flexible ERR provides asymmetric or incomplete insulation from foreign monetary policy shocks while capital controls provide insulation independent of the prevailing ERR.

It is important to note that the determinants of capital flows should be analyzed by using the estimation method that take into account the potential endogeneity and simultaneity among the variables. For instance, the results provided by Ahmed and Zlate (2014), Eichengreen et al., (2018) and Avdjiev et al., (2018) are based on the panel fixed effects estimation procedure. The potential drivers of capital flows are country-specific factors like growth and interest rate differentials suggested by Ahmed and Zlate (2014); GDP growth, investment environment and *de jure* measure of capital account openness provided by Eichengreen et al., (2018). By nature, panel fixed effects method considers that individual-specific effects are important source of the variation in the regressions and the ignorance of these leads to the omitted variable concerns. Therefore, it is obvious that the panel fixed effects estimation procedure does not consider the potential endogeneity along with the simultaneity among the variables. However, the variables proposed by Ahmed and Zlate (2014) and Eichengreen et al., (2018) can provide location advantageous to the host economies according to the Dunning and Zhang (2008). In this vein, the panel fixed effects procedure does not consider the potential endogeneity and simultaneity among the variables that provide location advantageous for the evolutions of capital flows. Therefore, we employ the generalized method of moments (GMM) procedure in explaining the determinants of capital flows because this method provides consistent estimators by considering the endogeneity and simultaneity among the variables.

The other important point is that the bulk of the literature does not consider the impacts of exchange rate regimes in explaining the determinants of capital flows, except Obstfeld et

al., (2018). Obstfeld et al., (2018) explain the determinants of net capital flows by employing panel fixed effects procedure and measure whether the impacts of global financial conditions may change across the exchange rate regimes (ERR) that consist of fixed, intermediate and floating regimes. In the study, Obstfeld et al., (2018) maintains floating ERR as the reference category and contains a dummy variable to control for the recent global financial crisis. The panel fixed effects procedure does not enable to correctly measure the impacts of global financial crisis and exchange rate regimes and does not consider the endogeneity among the variables like GDP growth, institutional quality, domestic credit etc. On the other hand, the studies that explain the determinants of capital flows does not consider the integration and cointegration properties among the variables. Also, they do not consider the potential thresholds in explaining the causes of capital flows. In the empirical part of this chapter, we investigate the impacts of structural domestic conditions along with the domestic pull and external push factors on gross capital flows and main components by employing two-step system GMM method. Then, we study the role of ERR in explaining the determinants of capital flows. By considering the integration and cointegration properties among the variables as well as endogeneity, we employ FM-OLS estimation method. Also, we employ panel threshold procedure of Hansen (1999) since the prevailing ERRs may constitute an endogenous thresholds and can magnify the impacts of variables.

3.2 Structural Domestic Conditions and the Main Determinants of Capital Inflows in EME

In this section, we investigate whether structural domestic conditions such as institutional quality represented by freedom (political rights and civil liberties), financial development and openness to international trade are significant drivers of capital inflows in EME along with the main push and pull factors. The bulk of the of the empirical literature considers static panel data models and employs the standard fixed/random effects procedures for estimation which ignores a potential simultaneity bias. This section considers also the potential endogeneity of domestic variables. We address the simultaneity issue along with the inclusion of the lagged dependent variable by estimating the equations with Generalised Method of Moments (GMM) procedures developed for dynamic panel data models (DPD) by Arellano

and Bond (1991) and Arellano and Bover (1995).

We postulate that capital flows can be explained with the main push factor (VIX), main pull factor (GDP growth) and structural domestic conditions. For structural domestic conditions, we consider trade openness, financial development and freedom are important in explaining capital inflows to EMEs. We consider gross capital inflows for an unbalanced panel of 38 emerging market economies[3] over the annual sample from 1986 to 2015 since the VIX data are available only after 1986. The choice of the sample is basically determined by data availability. We estimate the following benchmark equation to investigate the determinants of gross capital inflows:

$$\text{CIF}_{it} = \alpha_i + \beta_0 CIF_{i,t-1} + \beta_1 vix_t + \beta_2 GROWTH_{it} + \beta_3 Freedom_{it} + \beta_4 Openness_{it} + \beta_5 Depth_{it} + e_{it}$$

(3.1)

In Equation 3.1, i and t show, respectively, cross section and time dimension of the panel, α_i is the country specific fixed effect, CIF is the gross capital inflows scaled by GDP in current US dollars, vix is the natural logarithm of the VIX (Chicago Board Options Exchange's equity option volatility index) as a proxy to global financial conditions, GDP is the annual real GDP growth rate, Freedom is an indicator for political rights and civil liberties, Openness is the trade openness (sum of exports and imports of goods and services, as a % of GDP) and Depth is the financial depth (domestic credit to private sector, as a % of GDP). All capital flows data, measured in US dollars, are from International Financial Statistics of the IMF. The VIX data are from Chicago Boards Options Exchange Website. The freedom data are the simple average of political rights and civil liberties and measured on values between one and seven with higher values representing the lowest freedom. The freedom data are from Freedom House website. The data for real GDP, trade openness and financial depth are from World Development Indicators, World Bank.

A decrease in VIX suggests greater risk appetite and better global financial/liquidity conditions (González et al., 2008; Özatay et al., 2009; Rey 2015; Rey 2016; Eichengreen et

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[3] Emerging market economies are those that are included in the Morgan Stanley Capital International (MSCI) index and comprises Argentina, Bangladesh, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Chile, China, Colombia, Croatia, Czech Republic, Egypt, Estonia, Hungary, India, Indonesia, Israel, Jordan, Kazakhstan, Kenya, Lithuania, Malaysia, Mexico, Morocco, Nigeria, Pakistan, Peru, Philippines, Poland, Romania, Russia, Serbia, Slovak Republic, Slovenia, South Africa, South Korea, Thailand, Turkey.

al., 2016; Obstfeld et al., 2018). An increase in main push factor implies worsening global financial environment. According to the Heckscher-Ohlin-Mundell framework, trade integration decreases the incentives for capital to flow capital-scarce economies. On the contrary to the implications of Heckscher-Ohlin-Mundell suggesting substitutionary relation between trade integration and capital mobility, Antras and Caballero (2009) report that the relation between capital mobility and trade integration can be complementary in the presence of financial frictions. Davis and van Wincoop (2018) provide a theoretical model and find that higher trade openness reduces the correlation between gross capital inflows and outflows. Cerutti et al., (2017) find that the sensitivity of portfolio bond flows to global financial conditions is higher in more open economies. Özmen and Taşdemir (2019) find that higher level of trade openness considerably increases the sensitivity of capital flows to pull factor. The seminal work of Schumpeter (1911) suggest that financial development and better financial intermediation are important determinants of economic growth. Levine (1997) report that financial development promotes investment and economic growth by facilitating better productive allocation of resources and risk diversification. Alfaro et al., (2009) and Azman-Saini et al., (2010) suggest that financial development is an important precondition for augmenting a positive impact of FDI on economic development. Hermes and Lensink (2003), Hussain and Kimuli (2012) also emphasize the importance of financial development as an indicator for productivity growth, dissemination of foreign technology and accumulation of capital. Bengoa and Sanchez-Robles (2003) state that countries that have high levels of freedom has been more attractive to foreign investors. Kapuira-Foreman (2007) find that the presence of economic freedom results with higher FDI flows. Dutta and Roy-Kyklos (2010) report that higher level of FDI inflows promotes the media freedom.

The conventional estimation procedures like panel fixed effect may not be appropriate for estimating a dynamic model such as Eq. 3.1. The correlation between the error term and lagged dependent variable does not vanish mainly due to the time-invariant country-specific component of the error term. In dynamic models like Eq. 3.1, generalized method of moments (GMM) estimation procedure that introduced by Holtz-Eakin et al., (1988), Arellano and Bond (1991), Arellano and Bover (1995) will be more appropriate since this procedure provides consistent estimators by considering the reverse causality and endogeneity issues. Arellano and Bond (1991) developed the first difference GMM method. This procedure is

based on transforming the variables into first differences in order to omit the country-specific fixed effects, and then uses the lags of the variables in level form as instruments. Alonso-Borrego and Arellano (1999) and Blundell and Bond (1998) suggest that first difference GMM procedure is subject to weak instrument problem for the case of explanatory variables are persistent over time. At this point, Arellano and Bover (1995) and Blundell and Bond (1998) developed the system GMM procedure that associates the regression in differences and levels in a system. The instruments for the regression in differences are the lags of the variables in level form and the instruments for the regression in levels are the lags of the variables in difference form.

Table 3.1 reports the two-step system GMM estimation results. We consider aggregate capital inflows along with their main components portfolio equity, FDI and other investment inflows for our EME sample. It may be plausibly argued that the basic pull variable (GROWTH) and the variables representing structural domestic conditions (Openness, Depth and Freedom) are potentially endogenous for the evolution of the capital inflows. The VIX index is treated as exogenous. In the estimation, we use all the available t-2 and t-3 dynamic lags of GROWTH, Depth, Freedom and Openness as instruments. As noted by Bond (2002), the maintained endogenous variables should be treated symmetrically with the dependent variable, therefore we specify exactly the same dynamic lag structure for the instruments for the dependent variable (capital inflows). The instrument set contains also the current values of the maintained strictly exogenous variables VIX.

The consistency of the GMM estimators and the validity of instruments crucially depend on the absence of higher-order serial correlation in the idiosyncratic component of the error term. If the disturbance in the original dynamic levels equation is not serially correlated, there should be evidence of significant negative AR(1) and no significant AR(2) in the difference equation (Arellano and Bond, 1991). The equations in Table 3.1 pass all the diagnostics including the Hansen-Sargan test of over-identification restriction.

The estimation results reported in Table 3.1 suggest that, the main push factor (vix) is negative and statistically significant in explaining aggregate capital flows and their main components. Consequently, better global financial conditions and liquidity (a decrease in VIX) leads to an increase in all types of capital flows to EME. Under financial turbulence,

Table 3.1: The Main Determinants of Capital Inflows: GMM Estimation Results

	Capital Inflows	Portfolio Inflows	FDI Inflows	Other Inflows
Eq. 3.1	(3.1.1)	(3.1.2)	(3.1.3)	(3.1.4)
Lag. Dep. Variable	0.452***	0.086***	0.559***	0.536***
	(0.033)	(0.029)	(0.040)	(0.027)
vix_t	-0.013***	-0.009***	-0.004***	-0.005***
	(0.002)	(0.001)	(0.001)	(0.001)
$GROWTH_{it}$	0.311***	-0.010	0.068***	0.165***
	(0.040)	(0.025)	(0.023)	(0.022)
$Freedom_{it}$	-0.007**	-0.002***	0.001	-0.001
	(0.003)	(0.001)	(0.001)	(0.002)
$Openness_{it}$	-0.007	0.001	0.007	-0.001
	(0.021)	(0.004)	(0.008)	(0.009)
$Depth_{it}$	-0.014	0.008	0.016**	-0.016
	(0.027)	(0.006)	(0.007)	(0.012)
Constant	0.083**	0.037***	0.003	0.025*
	(0.036)	(0.007)	(0.011)	(0.014)
Test Statistics				
NT	700	667	942	944
N	37	37	38	38
χ^2_{H-S}	31.75$^{\oplus}$	35.52$^{\oplus}$	24.15$^{\oplus}$	31.10$^{\oplus}$
m1	-1.76[0.078]	-3.24[0.001]	-4.45[0.000]	-3.73[0.000]
m2	1.20[0.231]	0.58[0.559]	0.97[0.331]	0.46[0.644]
$\chi^2_W(6)$	1379.81***	1140.37***	274.91***	1452.94***
	[0.00]	[0.00]	[0.00]	[0.00]

Note: NT and N show, respectively, the total number of observations and cross section units. The values in square brackets are p-values, and in brackets are the standard errors. $***$, $**$ and $*$ denote, respectively, significance level at 1, 5 and 10 percent levels. χ^2_{H-S} is the χ^2 test of the Hansen-Sargan test for instrument validity and overidentification restrictions. $\oplus$ represents that instruments and overidentication restrictions are valid. m1 and m2 are the asymptotically normally distributed first and second order serial correlation test of the Arellano and Bond (1991). χ^2_W is the Wald test for the joint significance of the regressors.

on the other hand, capital inflows significantly decrease. This result is consistent the findings of the recent literature including Rey (2016). The main pull factor, GROWTH, is positive and significant for aggregate capital, FDI and other investment inflows. The positive impact of GROWTH on capital inflows suggests that all the capital flow types are pro-cyclical, except portfolio equity inflows. Consequently, capital inflows increase and potentially appear to amplify domestic growth in EME during episodes of higher growth. However, during downturns of growth, capital inflows tend to decrease and potentially lead to recessions to be much

deeper. This is, indeed, consistent with the findings of Kaminsky et al., (2004) suggesting that most OECD and developing economies experience the episodes of capital inflows in good times and capital outflows in bad times. Also, Kaminsky et al., (2004) find that macroeconomic policies are expansionary in the episodes of capital inflows whilst contractionary in the episodes of capital outflows. Therefore, the reinforcement of capital flow and macroeconomic cycle leads to the "when it rains, it pours" symptom.

Our results for the impacts of the main pull and push factors provides a support Avdjiev et al., (2018) which find that capital inflows are negatively associated with vix and positively associated with GDP growth across all capital flow types, except portfolio equity. The results by Sarno et al., (2016) and Boero et al., (2019) also suggest that global push factors dominate domestic variables in explaining portfolio flows. The statistical insignificance of GROWTH in explaining portfolio flows appears to support Sarno et al., (2016) and Boero et al., (2019). Our findings are also in line with Eichengreen et al., (2018) which suggest that portfolio flows are mainly driven by push factors. Eichengreen et al., (2018) further finds that FDI inflows are explained mainly by pull factors, whilst other investment flows are driven by both push and pull factors.

The Freedom variable which is the simple average of political rights and civil liberties is an important determinant of the aggregate and portfolio inflows in EME. The freedom variable lies between one and seven with higher values representing the lowest freedom. The Freedom variable is negative and statistically significant in the equations of aggregate capital and portfolio equity inflows. The aggregate and short-term (portfolio) capital inflows tend to prefer EME with more political rights and civil liberties. As already discussed, the literature provides often contrasting and inconclusive results for the impact of trade integration on capital flows. The conventional Heckscher-Ohlin-Mundell framework postulates that higher trade integration decreases the incentives for capital to flow capital-scarce economies. On the contrary, Antras and Caballero (2009) report that the relation between capital mobility and trade integration can be complementary in the presence of financial frictions. Cerutti et al., (2017) find that the sensitivity of portfolio bond flows to global financial conditions is higher in more open economies. The results by Table 3.1, however suggest that openness to international trade, is not, indeed significant in explaining capital flows to EME. Financial depth is positive and statistically significant for FDI inflows. Consequently, long term international financial

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investments such as FDI, appear to prefer more developed financial markets.

Our findings suggesting the importance of global financial conditions on capital inflows is in line with the finding suggesting that EME "need to closely monitor their lenders and investors to assess their inflow exposures to global push factors" (Cerutti, et al., 2017, p. v). However, higher growth is also very important in attracting capital flows to EME. Furthermore, domestic structural conditions such as freedom is important as portfolio inflows tend to decrease with a worsening of liberty and human rights. Higher financial development is found to be important in attracting FDI inflows. To conclude, the main domestic pull (GROWTH) and external push (VIX, global financial conditions) are very important determinants of capital inflows in EME. However, freedom and financial development also matter for certain types of capital inflows.

3.3 Exchange Rate Regimes and the Main Determinants Capital Flows

The conventional wisdom suggests that credible managed exchange rate regimes (ERR) allow countries to import monetary policy credibility (and hence lower inflation) of the anchor currency country, reduce transaction costs and provide exchange rate guarantee and thus, it is expected that capital flows will be higher in credible managed ERRs (Rogoff et al., 2004). On the other hand, ERR flexibility extends the macroeconomic policy tools as indicated by trilemma in international macroeconomics. In this vein, Edwards (2011) reports evidence that ERR flexibility allows countries to reconcile external shocks. Consequently, the results by di Giovanni et al., (2008) indicate that impacts of external shocks are magnified in more rigid ERRs. Similarly, Erdem and Özmen (2015) find that the impacts of external real and financial shocks and domestic variables are significantly larger in managed ERRs as compared to floats.

The recent empirical literature presents mixed and conflicting results on the impact of ERR on capital inflows. For example, Magud et al., (2014) and Boudias (2015) find that exchange rate regime flexibility has no effect on capital flows in emerging market economies. Passari and Rey (2015) state that the insulation effects of floating ERRs may have been overestimated. Aizenman et al., (2016) find that the impact of center economies' monetary policy

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changes on financial development in the periphery countries varies by depending on the ERR and it is higher in more flexible ERRs. Cerutti et al., (2017) report that the sensitivity of capital inflows to global financial cycle does not change across the prevailing ERRs. However, Cerutti et al., (2017) suggest that the impact of global push factors on portfolio bond inflows is higher in emerging market economies with more flexible ERRs. Obstfeld et al., (2018) provides that the transmission of global financial shocks and domestic pull factors are magnified under a fixed ERR relative to more flexible regimes in emerging market economies. Barrot and Serven (2018) and Lafuerza and Servén (2019) find that the impact of global financial conditions on capital flows is higher in more financially open and less flexible ERRs. Ghosh et al., (2014) and Calderón and Kubota (2019) indicate that countries with less flexible ERRs are more likely to experience surge episodes. Ghosh et al., (2015) report that macroeconomic and financial vulnerabilities are lower in more flexible ERRs. Davis and Zlate (2019) state that more open and floating ERR prevailing countries partially connect domestic monetary policy to the base country's policy. Carvalho (2019) suggests that capital flows and domestic money holdings are correlated in floating ERRs. Wei (2018) indicates that flexible ERR provides asymmetric or incomplete insulation from foreign monetary policy shocks while capital controls provide insulation independent of the prevailing ERR.

In this part of the study, we consider the *de facto* –i.e., the actually followed, rather than the officially declared classification by Ilzetzki et al., (2017) (IRR). The classification by IRR divides *de facto* regimes into 6 "coarse" 15 "fine" categories reported in Table 3.2.

IRR notes that classifying episodes of severe macroeconomic instability with very high inflation and exchange rate change as floating, intermediate or pegged may be misleading as they could be incorrectly attributed to the ERR[4]. IRR classifies these episodes as "freely falling". In these classifications, higher values (up till 4 and 13, respectively in the coarse and fine classifications) denote more flexible exchange rate arrangements. In this context, Reinhart and Rogoff (2004, p.16) notes that:

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[4] Note that, Magud et al., (2014) and Boudias (2015) results are based on estimations of the equations which include ERRs defined by the IRR coarse classification ranging from 1 to 6. As already noted, in the IRR classification, the higher numbers correspond to more flexible ERRs up till 4. Consequently, maintaining that the "freely falling" and dual markets as more flexible ERRs than the floating regime may seriously be misleading. Therefore, the results by Magud et al., (2014) and Boudias (2015) should be interpreted with an extreme caution.

In our view, regimes associated with an utter lack of monetary control and the attendant very high inflation should not be automatically lumped under the same exchange rate arrangement as low inflation floating regimes. On these grounds, freely falling needs to be treated as a separate category ....

Table 3.2: The *de facto* ERR Classification

	Fine	Coarse
No separate legal tender	ERR1	
Pre announced peg or currency board arrangement	ERR2	ERR1
Pre announced horizontal band that is narrower than or equal to +/-2	ERR3	
De facto peg	ERR4	
Pre announced crawling peg	ERR5	
Pre announced crawling band that is narrower than or equal to +/-2%	ERR6	ERR2
De facto crawling peg	ERR7	
De facto crawling band that is narrower than or equal to +/-2%	ERR8	
Pre announced crawling band that is wider than or equal to +/-2%	ERR9	
De facto crawling band that is narrower than or equal to +/-5%	ERR10	ERR3
Moving band that is narrower than or equal to +/-2% (i.e., allows for both appreciation and depreciation over time)	ERR11	
Managed floating	ERR12	
Freely floating	ERR13	ERR4
Freely falling	ERR14	ERR5
Dual market in which parallel market data is missing	ERR15	ERR6

Source: Ilzetzki et al., (2017)

In our sample, by using coarse ERR classification, 20.94 percent of the countries are in ERR1, 37.65 percent are in ERR2, 40.81 percent are in ERR3, 0.60 percent are in ERR4.

In light of the recent findings in the literature, the rest of this chapter investigates whether prevailing ERRs magnifies the impact of pull and push factors in the analysis of capital flows. First of all, we will report fully-modified OLS (FM-OLS) and then panel threshold estimation results.

3.3.1 Exchange Rate Regimes and the Long-Run Determinants of Capital Inflows in EME

The bulk of the literature often ignores the integration and co-integration of the variables in the variable spaces postulated to explain capital flows. In this part of this study,

we attempt to provide a contribution by considering also this crucially important empiricial issue. To this end, we first employ FM-OLS procedure of Phillips and Hansen (1990) and Pedroni (2001). We prefer to use FM-OLS since the procedure incorporates a semi-parametric correction to the OLS estimator to eliminate the potential heterogeneity in the long-run relationship along with the endogeneity and serial correlation. The stationary residual of the estimated model with nonstationary variables implies the long run equilibrium-relationship (cointegration). By providing that the variables are cointegrated, FM-OLS procedure provides super-consistent estimators.

The GMM estimation results presented by the previous section basically suggest that capital inflows are driven mainly by pull (GROWTH) and push (VIX) factors. In the context of this evidence, we now investigate that whether the impacts of pull and push factors differ across the prevailing ERR in explaining capital flows for an unbalanced panel of 35 EMEs[5] over the annual sample from 1986 to 2015. To this end, we consider the following benchmark equation:

$$CIF_{it} = \alpha_0 + \alpha_1 GDP_{it} + \alpha_2 vix_t + u_{it} \tag{3.2}$$

In Eq. 3.2, the subscript i and t represent, respectively, country and time, CIF is gross capital inflows scaled by GDP in current US dollars, GDP is the log of real GDP in constant 2010 US dollars and vix is the log of the Chicago Board Options Exchange's equity option volatility index. We estimate Eq. 3.2 also for the main components of aggregate capital inflows, namely, portfolio equity, FDI and other investment inflows by scaling these variables with GDP in current US dollars. ERR variable covers the observations for ERR1 (hard pegs), ERR2 (limited flexibility), ERR3 (managed floating) and ERR4 (freely floating). The ERR variable is time varying and lower numbers indicate less flexible ERRs. As already noted, following Rogoff et al., (2004), we do not consider the episodes of ERR5 (freely falling) and ERR6 (dual market) of the coarse classification.

Table 3.3 reports Levin et al., (2002) panel unit root test results for capital flows and their main components, real GDP, and augmented Dickey-Fuller test for vix. The panel unit

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[5] Emerging market economies are those that are included in the Morgan Stanley Capital International (MSCI) index and comprises Argentina, Bangladesh, Bosnia and Herzegovina, Brazil, Bulgaria, Chile, China, Colombia, Croatia, Czech Republic, Egypt, Hungary, India, Indonesia, Israel, Jamaica, Kenya, Lithuania, Malaysia, Mexico, Morocco, Nigeria, Pakistan, Peru, Philippines, Poland, Romania, Russian Federation, Serbia, Slovak Republic, Slovenia, South Africa, South Korea, Thailand and Turkey.

root test results suggest that all the variables are nonstationary (I(1)) in levels and stationary (I(0)) in first differences. Table 3.4 reports the FM-OLS estimation results. Panel unit root test results of Levin et al., (2002) suggest that the residuals in the equations are stationary. Therefore, the estimation results in Table 3.4, may be interpreted as representing a long-run equilibrium relationships i.e. cointegration.

Table 3.3: Unit Root Tests

	LLC	
Variables	Levels	First Differences
Capital_Inflows$_{it}$	1.24[2]	-7.86[1]**
Portfolio_Eq._Inflows$_{it}$	3.53[2]	-9.02[1]**
FDI_Inflows$_{it}$	3.15[2]	-12.81[1]**
Other_Inv._Inflows$_{it}$	2.36[2]	-14.38[1]**
GDP$_{it}$	-0.07[1]	-12.51[1]**
	ADF	
vix$_t$	0.96[0]	-8.22[0]**

Note: LLC and ADF are the Levin, Lin and Chu (2002) panel unit root and augmented Dickey-Fuller test, respectively. ** denotes the rejection of the unit root null at the 5 percent significance level. The values in brackets [.] are the lag lengths which may be plausible for annual data. The unit root test equations contain a constant term and trend.

In Table 3.4, managed ERRs define the episodes for ERR1 (hard pegs) and ERR2 (limited flexibility) while floating ERRs[6] represent the episodes for ERR3 (managed floating) and ERR4 (freely floating) in the coarse ERR classification of Ilzetzki et al., (2017). The estimation results in Table 3.4 suggest that, the main push factor (vix) is negative and statistically significant in exploring the determinants of both aggregate and disaggregate capital inflows, except FDI. This implies that better global financial cycle and greater risk appetite (a decrease in vix) results with higher capital inflows. However, the effect of push factor differs across the prevailing ERR. The main push factor is significantly negative in floating ERRs, except FDI while it is negative and insignificant in managed ERRs except portfolio equity. For portfolio inflows, the impact of main push factor is almost the same in managed and floating ERRs. The main pull factor (real GDP) is positive and statistically significant in aggregate capital and FDI inflows. This indicates that an increase in real GDP attracts more aggregate capital and FDI inflows. But, the impact of pull factor also differs across the prevailing ERR. The

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[6] In this study, we use floating and flexible exchange rate regimes interchangeably.

effect of pull factor is statistically significant only in floating ERRs, except portfolio equity.

Regarding the estimation results in Table 3.4, consistent with Eichengreen et al., (2018) and Avdjiev et al., (2018), we find that aggregate flows determined by both pull and push factors, portfolio equity flows driven by push factor, FDI flows determined by pull factor and other investment flows explained by both pull and push factors. The effect of pull and push factors differ across the ERRs. Except portfolio equity flows, pull and push factors are significant only in floating ERRs. The results suggest that managed ERR provides insulation mainly due to importation of monetary policy credibility of the anchor currency country, lower transaction costs and exchange rate guarantee.

3.3.2 Exchange Rate Regimes as Endogeneous Thresholds

The literature is yet to investigate whether prevailing ERRs provide endogenous thresholds[7] for the impacts of basic pull and push factors on capital flows. In this context, the main aim of this section is to investigate this important issue empirically for a balanced panel of 27 EMEs by employing panel threshold model of Hansen (1999)[8]. To this end, in accord with the main findings of the recent literature and GMM estimation results reported in Section 3.2, we postulate that global financial conditions proxied by vix as the main push factor and real GDP growth as the main pull factor to explain capital inflows in EMEs. In this context, we consider also the main components of capital (portfolio equity, foreign direct investment and other investment) inflows.

To investigate the main determinants of gross capital inflows, we consider the following simple benchmark equation:

$$CIF_{it} = \alpha_0 + \alpha_1 GROWTH_{i,t-1} + \alpha_2 \Delta vix_t + u1_{it} \tag{3.3}$$

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[7] This part of the thesis is published as ERC Working Paper which is available at: http://www.erc.metu.edu.tr/menu/series18/1810.pdf

[8] A summary information for panel threshold estimation procedure is available in Appendix C.

Table 3.4: Exchange Rate Regimes and the Main Determinants of Gross Capital Flows

	vix_t	GDP_{it}	Statistics
Capital Inflows	-1.088(0.542)**	1.158(0.654)*	R^2=0.206, LRV=18.794, N=33, NT=645, LLC=-17.73[0.00]
Managed ERRs	-0.351(0.647)	1.691(0.856)**	R^2=0.234, LRV=13.797, N=29, NT=374, LLC=-16.35[0.00]
Floating ERRs	-1.224(0.525)**	3.973(0.784)**	R^2=0.459, LRV=7.222, N=20, NT=269, LLC=-14.10[0.00]
Portfolio Inflows	-0.786(0.185)**	0.198(0.226)	R^2=0.191, LRV=2.109, N=34, NT=632, LLC=-20.59[0.00]
Managed ERRs	-0.759(0.239)**	0.378(0.313)	R^2=0.193, LRV=1.722, N=30, NT=360, LLC=-17.78[0.00]
Floating ERRs	-0.769(0.226)**	0.270(0.337)	R^2=0.245, LRV=1.347, N=20, NT=270, LLC=-13.89[0.00]
FDI Inflows	-0.063(0.260)	0.580(0.247)**	R^2=0.247, LRV=5.525, N=35, NT=829, LLC=-18.86[0.00]
Managed ERRs	-0.098(0.331)	0.063(0.355)	R^2=0.222, LRV=5.085, N=31, NT=497, LLC=-15.58[0.00]
Floating ERRs	-0.172(0.235)	1.780(0.321)**	R^2=0.425, LRV=1.667, N=24, NT=329, LLC=-13.24[0.00]
Other Investment Inflows	-0.856(0.406)**	0.067(0.386)	R^2=0.150, LRV=13.472, N=35, NT=831, LLC=-17.57[0.00]
Managed ERRs	-0.113(0.472)	0.563(0.496)	R^2=0.178, LRV=10.378, N=31, NT=501, LLC=-14.27[0.00]
Floating ERRs	-0.771(0.362)**	1.567(0.497)**	R^2=0.302, LRV=3.920, N=24, NT=327, LLC=-14.79[0.00]

Note: LRV denotes long-run variance. The values in parentheses are the standard errors. * and ** denote the significance at the 10 and 5 percent, respectively. N and NT are, correspondingly, the numbers of countries and observations for the sample. LLC is the Levin et al., (2002) panel unit root test for the equation residuals. The optimum lag lengths for the tests are chosen by the AIC. The values in brackets [.] are the p-values for the corresponding null hypothesis. The unit root test equation contains a constant and trend terms.

In Eq. (3.3), the subscript i and t denote, respectively, country and time, Δ is the difference operator, CIF is gross capital inflows scaled by GDP in current US dollars, GROWTH is the real GDP growth and vix is the natural logarithm of the VIX to proxy the global financial cycle. We postulate that capital inflows may parsimoniously be explained by the main pull (GROWTH) and push (Δvix) factors. Considering the potential endogeneity of real GDP growth for the evolution of capital flows, we consider lagged GROWTH in Equation (3.3).

The benchmark Eq. (3.3) maintains that the impacts of the main pull and push factors are invariant to the prevailing ERRs. Alternatively, ERR may be an endogenous threshold variable magnifying the impacts of the main determinants of capital inflows. In the context of the panel fixed effects threshold model of Hansen (1999), we first consider the impact of the push factor:

$$CIF_{it} = \beta_0 + \beta_1 GROWTH_{i,t-1} + \beta_2 \Delta vix_t (ERR \leq \lambda) + \beta_3 \Delta vix_t (ERR > \lambda) + u2_{it} \qquad (3.4)$$

Alternatively, the ERR may be postulated as a threshold for the impact of the main pull factor:

$$CIF_{it} = \delta_0 + \delta_1 \Delta vix_t + \delta_2 GROWTH_{i,t-1} (ERR \leq \lambda) + \delta_3 GROWTH_{i,t-1} (ERR > \lambda) + u3_{it}$$
$$(3.5)$$

In Eq. (3.4) and Eq. (3.5), λ is endogenously estimated single threshold value for the ERR. Under the null hypothesis that $\beta_2 = \beta_3$ in Eq. (3.4) or $\delta_2 = \delta_3$ in Eq. (3.5), there are no significant thresholds for the effects of the ERR and thus we obtain Eq. (3.3). We estimate the equations also for the main components (portfolio equity, foreign direct investment and other investment) of gross capital inflows. For the ERRs, we consider the *de facto* –i.e., the actually followed, rather than the officially declared- classification by IRR. The classification by IRR divides *de facto* regimes into 6 "coarse" -fixed, limited flexibility, managed floating, freely floating, freely falling, dual market in which parallel market data is missing- and 15 "fine" (ERR1, ERR2, ... ERR15) categories. As it allows more flexibility to estimate the thresholds, we consider the "fine" classification of IRR in our empirical analysis. However, we interpret our results considering also the "coarse" classification. Our effective estimation sample does not contain the coarse (fine) ERR classification greater than 4 (13).

Our balanced panel data contain 27 emerging market economies[9] (EME) spanning the period between 1996 and 2015. The choice of the sample is basically determined by data availability to obtain a balanced data which is necessary to employ the Hansen (1999) procedure. This sample period is, indeed, consistent with Obstfeld (2015, p. 15) indicating that the post-1990 sample "captures the regularities that apply during the recent period of high and growing financial globalization".

Table 3.5 presents the results of the estimation of Eq. 3.4 employing the Hansen (1999) procedure[10] . The equation specifies that the impact of the main push factor (GFC, proxied by Δvix) may change across the prevailing *de facto* ERRs. The results by Table 3.5 suggest that, the pull factor (GROWTH) is positive and significant in explaining all capital inflow types except portfolio inflows. These results also strongly suggest that, ERR10 (crawling band narrower or equal to +/- 5%) is the threshold for the impact of GFC on aggregate and portfolio inflows. The ERR regime threshold is estimated as 8 (crawling band narrower or equal to +/- 2%) for FDI flows. The threshold estimate for other investment inflows (12, managed floating) appears to be statistically insignificant. For aggregate and portfolio inflows, "managed floating" regimes in the *de facto* coarse classification of IRR are estimated as the endogenous threshold. For FDI inflows, the threshold appears to be the "limited flexibility" regime. The results suggest that, the push factor (Δvix) is not significantly negative for all capital inflow types, except portfolio inflows, in the low regime (more rigid ERRs). The exchange rate stability appears to be effective in preventing a decrease in these capital inflows in countries with more rigid ERRs. Worsening global financial conditions, on the other hand, leads to a decrease in aggregate capital and portfolio inflows in EME implementing more flexible ERRs. This is consistent with an interpretation that worsening GFC leads to capital move from EME to the other EME with more rigid ERRs or to AE, respectively, due to exchange rate guarantee or flight to safety concerns.

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[9]   Emerging market economies (EME) are those included in the Morgan Stanley Capital International (MSCI) index, and comprises Argentina, Brazil, Bulgaria, Chile, China, Colombia, Croatia, Czech R., Egypt, Hungary, India, Indonesia, Israel, Kenya, Lithuania, Mexico, Morocco, Pakistan, Peru, Philippines, Poland, Romania, Russian F., S. Africa, S. Korea, Thailand, Turkey.

[10] Our preliminary results (not reported to save the space but available on request) suggested not to reject the null hypothesis that two thresholds (three regimes) are insignificant for all the specifications considered in this paper. The trimming parameter for the Hansen procedure is set to be 0.05 at both ends of the threshold variable but our results are found to be robust for different plausible values.

Table 3.5: Exchange Rate Regimes and the Threshold Impact of the Push Factor

Capital Flows Variable	Capital Inflows	Portfolio Equity Inflows	FDI Inflows	Other Investment Inflows
Threshold ERR F_b [.]	10 9.47[0.02]**	10 7.83[0.05]**	8 5.68[0.02]**	12 5.33[0.19]
The Determinants of Capital Inflows				
$GROWTH_{i,t-1}$	0.369 (0.057)**	-0.007 (0.021)	0.128 (0.035)**	0.240 (0.036)**
Δvix_t ERR$\leq\lambda$	0.938(0.851)	-0.691(0.392)*	1.321(0.573)**	0.503(0.435)
Δvix_t ERR $> \lambda$	-3.269 (1.102)**	-2.126 (0.414)**	-0.601 (0.592)	-9.221 (4.223)**
Constant	2.412 (0.280)**	0.790 (0.105)**	1.718 (0.172)**	-0.106 (0.181)
Statistics	N=27 NT=513 R^2=0.10 F=17.40 [0.00]	N=27 NT=513 R^2=0.06 F=10.9 [0.00]	N=27 NT=513 R^2=0.05 F=7.9 [0.00]	N=27 NT=513 R^2=0.10 F=19.6 [0.00]

Note: F_b[.] is the bootstrapped F-test based on 1000 replications to test the statistical insignificance of the threshold level and [.] is the p-value of the test. The values in parentheses are the standard errors. * and **, respectively, denote significance at 5 percent and 1 percent levels. N and NT are, correspondingly, the numbers of countries and the effective number of observations.

Table 3.6: Exchange Rate Regimes and the Threshold Impact of the Pull factor

Capital Flows Variable	Capital Inflows	Portfolio Equity Inflows	FDI Inflows	Other Investment Inflows
Threshold ERR F_b [.]	5 20.3[0.00]**	7 5.39[0.13]	7 4.67[0.17]	5 28.4[0.00]**
The Determinants of Capital Inflows				
Δvix_t	-0.578 (0.672)	-1.204 (0.255)**	0.361 (0.416)	0.408 (0.422)
$GROWTH_{i,t-1}$ ERR$\leq\lambda$	0.734 (0.099)**	-0.650 (0.342)*	0.226 (0.056)**	0.519 (0.062)**
$GROWTH_{i,t-1}$ ERR$>\lambda$	0.252 (0.062)**	0.021 (0.240)	0.936 (0.039)**	0.161 (0.039)**
Constant	2.460 (0.278)**	0.803 (0.106)**	1.681 (0.172)**	-0.121 (0.740)
Statistics	N=27 NT=513 R^2=0.12 F=21.20 [0.00]	N=27 NT=513 R^2=0.06 F=10.0 [0.00]	N=27 NT=513 R^2=0.04 F=7.6 [0.00]	N=27 NT=513 R^2=0.15 F=28.0 [0.00]

Note: $F_b[.]$ is the bootstrapped F-test based on 1000 replications to test the statistical insignificance of the threshold level and [.] is the p-value of the test. The values in parentheses are the standard errors. * and **, respectively, denote significance at 5 percent and 1 percent levels. N and NT are, correspondingly, the numbers of countries and the effective number of observations.

We now consider the alternative case that the impact of the pull factor (GROWTH) changes across the ERRs. Table 3.6 presents the results of the estimation of Eq. 3.5 which maintains ERR as a threshold for the impact of GROWTH. For FDI and portfolio inflows, estimated threshold (ERR7) is statistically insignificant. Therefore, the ERRs appear not to provide a significant threshold for the impact of domestic growth on FDI and portfolio inflows.

For aggregate capital and other investment inflows, on the other hand, ERR5 (Pre announced crawling peg; de facto moving band narrower than or equal to +/-1 percent) is estimated as the significant endogenous threshold. This threshold corresponds to mainly pegged ERRs in the "coarse" classification of IRR (2017). The impact of domestic economic conditions, proxied by GROWTH, appears to be substantially much higher on aggregate capital and other investment inflows under pegged ERRs than more flexible ERR arrangements. GFC, proxied by Δvix, on the other hand, is negative and significant only for portfolio inflows. This result, is indeed consistent with the results presented by Table 3.5 suggesting that ERRs provide thresholds for the impact of GFC. Consequently, ignoring these thresholds may lead to misleading results.

3.4 Main Findings and Concluding Notes

The conventional economic theory suggests that free international movement of capital is beneficial to countries mainly by increasing the investment, productivity and growth. This chapter investigates the determinants of capital flows and analyzes whether the impacts of the main common external (push) and country-specific (pull) factors on capital inflows are invariant to the prevailing de facto exchange rate regimes (ERR) in EME.

Chapter 3.1 presents a brief review of the literature that explains the drivers of capital flows. We report that the bulk of the recent studies investigate the determinants of capital flows within the pull and push factors context thanks to the seminal contributions of Calvo et al., (1993) and Fernandez-Arias (1996). Following the recent literature including Mirando-Agrippino and Rey (2012; 2015), we consider VIX as to represent global financial/liquidity conditions. In this context, we consider VIX as the main push factor and real GDP growth as the main pull variable. This chapter briefly reviews also the recent literature stressing the

roles of some structural domestic conditions in explaining capital flows.

Chapter 3.2 investigates whether structural domestic conditions such as institutional quality represented by freedom (political rights and civil liberties), financial development and openness to international trade are significant drivers of capital inflows in EME along with the main push (VIX) and pull (GROWTH) factors. Considering the presence of the lagged dependent variable and the potential endogeneity of growth and variables representing structural domestic conditions, we employ two-step system GMM estimation procedure developed for dynamic panel data models. This may be interpreted as one of the important contributions of this literature as the bulk of the literature employs conventional panel fixed/random effects procedures in estimating the drivers of capital flows. Our empirical results are in line with the recent literature including Avdjiev et al., (2018) which finds that capital inflows are negatively associated with VIX and positively associated with GDP growth across all capital flow types, except portfolio equity. Consistent with Sarno et al., (2016) and Boero et al., (2019), we find that the global push factors tend to dominate the domestic pull factor in portfolio flows. Our empirical findings provide a support also to Eichengreen et al., (2018) which suggest that portfolio flows are mainly driven by push factors, FDI inflows are explained mainly by pull factors, whilst other investment flows are driven by both push and pull factors. We also find that structural domestic conditions are also important for certain types of capital inflows in EME. The aggregate and short-term (portfolio) capital inflows tend to prefer EME with more political rights and civil liberties. Financial depth is positive and statistically significant for FDI inflows. Consequently, long term international financial investments such as FDI, appear to prefer more developed financial markets.

The bulk of the empirical literature investigating capital flows does not consider the integration and cointegration properties of data and thus the recent advances in estimating nonstationary panel data estimation procedures. Chapter 3.3.1 considers this issue and estimates long-run (cointegrating) equations by employing the FM-OLS procedure. In this section, we also investigate whether the impacts of the main pull and push factors are invariant to the prevailing *de facto* exchange rate regimes. Our results strongly suggest that ERR do indeed matter for the long-run impacts of the main pull and push factors. We find that better global financial conditions (a decrease in VIX) results with higher capital inflows in the long-run, except FDI inflows. The impact of this push factor, however, often differs across the prevail-

ing ERR. For aggregate capital and other investment inflows, VIX is negative and significant only under floating ERR. The main pull factor (real GDP) is positive and statistically significant in aggregate capital and FDI inflows. This indicates that an increase in real GDP attracts more aggregate capital and FDI inflows. But, the impact of pull factor also differs across the prevailing ERR. The impact of GFC is substantially high under more flexible ERRs for all capital inflow types except FDI. FDI inflows are basically determined by GROWTH across all ERRs. Portfolio inflows are mainly determined by GFC. The pull factor is statistically significant only in floating ERRs, except portfolio equity. The sensitivity of portfolio inflows to GFC is almost the same under both of the ERRs. The impact of the domestic pull factor on aggregate and other investment inflows tends to be much higher under more flexible ERRs[11] GFC are not significant in determining the evolution of aggregate and other investment inflows under rigid ERRs.

Chapter 3.3.2 investigates whether prevailing ERR provide endogenous thresholds for the impacts of basic pull and push factors on capital flows in EME by employing panel threshold model of Hansen (1999). Our results provide a further support for a postulation that ERR do often matter for the impacts of the main push and pull factors. The impact of the pull factor (GROWTH) is substantially much higher under managed ERR for all capital inflows except FDI and other investment inflows. The impact of the external financial conditions on capital inflows increases with ERR flexibility. This result is consistent with the conventional wisdom suggesting that credible managed ERRs encourage capital inflows by allowing countries to import monetary policy credibility of the center country and to provide exchange rate guarantee. Our findings provide a further support also to the seminal paper by Calvo et al., (1996) which argues that greater exchange rate flexibility introduces uncertainty and thus may discourage cross-border flows. An adverse global financial shock may be expected to lead to domestic currency depreciation and thus to increase exchange rate risk in EME with floating ERRs. All these may discourage foreign residents to buy domestic assets (capital inflows) of these countries. Consistent with this interpretation, Ghosh et al., (2014) find that countries with less flexible ERRs are more likely to experience capital inflow surges. Our results also support the Passari and Rey (2015) postulation that the insulation properties of floating ERRs

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[11] However, the FM-OLS estimation results suggest that the impact of main pull factor is significant in floating ERRs in explaining aggregate, FDI and other investment flows. But, this result should be interpreted cautiously since FM-OLS procedure explains the long-run equilibrium relation.

may have been over-estimated[12].

   To conclude, the results of Chapter 3.3 strongly suggest that ERRs appear to matter for the impacts of the main global push and country-specific pull factors on the evolution of capital inflows to EME. Exchange rate regime flexibility, albeit potentially providing a buffer against external shocks by allowing more monetary policy independence, also contains uncertainty and exchange rate risk discouraging capital inflows during the episodes of global financial turbulence.

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[12] Our results, however, fail to provide a support to the recent Obstfeld et al., (2018) finding that the transmissions of global financial shocks and domestic pull factors are magnified under a fixed ERR relative to more flexible regimes in EME. Obstfeld et al., (2018) defines the ERRs thresholds as exogenous and maintains floating ERR as the reference category. Furthermore, this finding by Obstfeld et al., (2018) is basically based on the estimation of equations containing a dummy variable to control for the recent global financial crisis.

CHAPTER 4

THE CONSEQUENCES OF CAPITAL FLOWS

International capital flows have often been regarded as one of the main drivers of economic growth and business cycles especially in emerging markets (EME) and developing economies (DE) as reported by the pioneering studies by Calvo et al., (1993; 1996). The results by Kose et al., (2009) indicates that policies promoting financial development, institutional quality, and trade openness appear to help developing countries to derive the benefits of globalization. The recent findings of Kose et al., (2011), Erdem and Özmen (2015) and Rey (2016) provide a support for this critically important issue. As already reported in Chapter 2 of this study and also indicated by Abraham and Schmukler (2018) and Lane and Milesi-Ferretti (2018), the impressive increase in capital flows and international financial integration has led the investigation of consequences of capital flows to be much more important theoretical and topical issue in international economics literature.

The literature following the conventional Mundell-Fleming framework states that, for a given monetary policy framework, capital inflows result with an appreciation and consequently a contraction in net exports (exports minus imports) and growth (Blanchard et al., 2017). However, the conventional wisdom also suggests that access to the foreign capital provides additional funding for investment projects and thus, the impact of capital flows is expected to be expansionary. Supporting this point, Mundell-Fleming model indicates that capital inflows are expansionary given that the monetary policy rate is decreased adequately. These important theoretical and economic policy issues are neatly summarized by Blanchard et al., (2017, p. 563):

> The workhorse open economy macromodel suggests that capital inflows are contractionary because they appreciate the currency and reduce net exports. Emerging market policy makers, however, believe that inflows lead to credit booms and

rising output, and the evidence appears to go their way.

Are capital inflows expansionary or contractionary? One would think that the question was settled long ago. But, in fact, it is not. And there is a striking *schizophrenia*.

Standard models, along Mundell–Fleming lines or more modern incarnations, give one answer: For a given monetary policy rate, inflows lead to an appreciation and thus a contraction in net exports and, in turn, a contraction in output. ... Emerging market policy makers, however, have a completely different view. They see capital flows as leading to credit booms and an increase in output, which can only be offset by an increase in the policy rate. The evidence appears to support the beliefs of policy makers: Capital inflows appear to be typically associated with appreciations, credit booms, and an increase in output. ***They also appear to play a major role in driving boom-bust cycles*** (Reinhart and Reinhart, 2009).

The basic motivation of this chapter is, indeed, provided by main question of Blanchard et al., (2017): On the theoretical consequences and policy implications of the international capital inflows: "***How can we reconcile the models and reality?***" provides an important starting point. The empirical literature, as convincingly reminded by Blanchard et al., (2017) provides mixed and often conflicting results on the impact of capital flows on economic growth.

Reinhart et al., (2008) find that large capital flows increases the consumption volatility and vulnerability to a crises and thus, decreases economic growth. Cardarelli et al., (2010) report that surge episodes are positively associated with growth, but when surges come to the end with tears, growth decelerates substantially. Combes et al., (2019) report that capital flows are positively associated with growth in low and middle income countries. The findings of Eng and Wong (2016) suggest that capital inflows do not lead to more growth, but capital outflows are negatively associated with growth. The results by Durham (2004) suggest that the impacts of FDI and portfolio flows on growth depend on the financial development level of the host countries. Kyaw and Macdonald (2009) report that the impacts of FDI and portfolio flows are growth-enhancing in middle income countries. Ghosh et al., (2016) suggest that portfolio and other investment inflows are related with macroeconomic imbalances and financial vulnerabilities. The empirical findings of Blanchard et al., (2017) support the postulation of emerging market policy makers suggesting capital inflows cause to credit growth and increase the economic growth, but the expansionary impact of capital flows holds only

for non-bond flows (the sum of portfolio equity, FDI and other investment flows).

The bulk of the earlier literature has often focused on the evolution and consequences of net capital flows. As already reported in Chapter 3, gross flows are also crucially important for growth and financial stability issues (Forbes & Warnock, 2012; Broner et al., 2013; Ghosh et al., 2014). Abraham and Schmukler (2018) suggests that, for instance, in developed and developing countries, financial globalization has manifested itself in increasing gross capital flows (inflows and outflows) rather than larger net flows. Moreover, the literature, however, often focuses on aggregate capital and FDI inflows. The recent literature, including Blanchard et al., (2017), Igan et al., (2017) and Eichengreen et al., (2018), on the other hand, convincingly emphasize the importance of the consequences of the main components of capital flows.

The literature is yet to fully investigate whether the impacts of capital flows and their main components are expansionary or contractionary. In this context, the main aim of this chapter is to investigate this important issue for unbalanced panel of EME and DE. We first investigate this important issue by considering and employing conventional estimation procedures like panel least squares and panel fixed effects. These two procedures, however, do not consider the potential endogeneity of the explanatory variables. To tackle this issue, we first proceed with the estimation of our model by employing two-step system GMM method. As all these methods do not explicitly take into account the integration and co-integration properties among the variables, we consider also fully-modified OLS (FM-OLS) and panel autoregressive distributed lag (PARDL) models.

The plan for the rest of this chapter is follows. Section 4.1 briefly reviews the literature on the consequences of capital flows. Section 4.2 presents a brief critical discussion of the recent growth literature. In Section 4.3, we present a conventional growth model augmented with capital inflow variables along with the global financial conditions proxied by VIX. This section presents also results from panel least squares and panel fixed effects methods. Section 4.4 considers the potential endogeneity problem and presents the two-step system GMM estimation results. In 4.5, along with the human capital and financial development variables of the conventional growth models, we consider also some other structural domestic variables including rule of law, trade openness and financial openness. This section considers the integration and co-integration properties of the variables and employs FM-OLS procedure to

estimate the equations. Section 4.6 is devoted to estimate equilibrium/error correction mechanisms and short run coefficients by applying PARDL method. Finally, Section 4.7 summarizes the main findings and concludes the chapter.

4.1 The Consequences of Capital Flows: A Brief Literature Review

The bulk of the earlier studies investigated the impacts of capital account liberalization that is maintained as a pre-requisite for financial asset transactions on economic growth. For instance, Bekaert and Harvey (1998) suggests that economic growth will be lower than the potential level in economies with financial account restrictions. The findings of Levine (2001) state that lessened restrictions on capital account is associated with higher economic growth. In the same vein, Chanda (2005) indicates that prevailance of capital controls leads to a decrease in growth. Dreher (2006) finds that the economic integration measured by the lack of trade and capital account restrictions is associated with the higher economic growth. Kose et al., (2009) suggest that financial openness leads to an increase in total factor productivity. Bussiere and Fratzscher (2008) report that financial openness is positively related with economic growth in the short-run. Broner and Ventura (2016) provide a theoretical model suggesting that, in the initial stages of development, countries discriminate between domestic and foreign financial markets. In the later stages of development, however, they should phase-out the discrimination so as to increase investment and growth. Edison et al., (2002) report that the relation between international financial integration and growth is not robust across to the alternative measures of international financial integration. The lack of robust association between capital account liberalization and growth has been led the researchers also to investigate whether this relation depends on the absorptive capacities of the economies. In this context, the impact of capital account liberalization on economic growth is higher in countries that have intermediate level of economic development (Edison et al., 2004), better institutional environment (Arteta et al., 2001) and developed financial system (Eichengreen and Leblang, 2003). Furthermore, the empirical findings of Klein and Olivei (2008) and Quinn and Toyoda (2008) suggest that capital account liberalization is associated with higher level of economic growth in developed countries.

The recent studies often suggest that the impacts may vary according to the main components of capital inflows. The bulk of the studies often agree with a result that FDI enhances growth. Adams (2009) investigates the impact of FDI on economic growth for Sub-Saharan Africa and finds that this impact is sensitive to the estimation procedure employed. Adams (2009) also finds that FDI improves total factor productivity rather than increasing the accumulation of capital and thus, enhances economic growth, albeit partially crowding out domestic investment. In the same vein, Calderón and Nguyen (2015) find that foreign aid and FDI flows are positively associated with economic growth in Sub-Saharan Africa countries. According to Borensztein et al., (1998) FDI is an important vehicle for transferring technology and promoting growth in emerging market and developing economies (EMDE) only when the host country has a minimum threshold of human capital. Baharumshah et al., (2006) report that FDI enhances economic growth both in the short-run and long-run and this impact of FDI is higher than domestic investment. Mody and Murshid (2005) suggest that the positive association between foreign capital and investment is stronger in countries that have better macroeconomic environment. The findings of Balasubramanyam et al., (1996) provide a support for the Bhagwati hypothesis suggesting that growth impact of FDI is higher in export-promoting countries than import-substituting countries. Aizenman et al., (2013) suggest that lagged FDI increases the economic growth even in the crisis periods and in this sense, they provide a support for the postulation that some types of capital flows are more desirable than the others. Alfaro (2016) indicates that growth impacts of FDI depends on domestic conditions and policies including policy environment, quality of local institutions and financial markets, sector characteristics market structure, and spatial co-location. Kutan et al., (2017) report that institutional quality encourages financial development and thus, leads to improvement in the growth impacts of FDI in Middle East and North Africa countries. The growth impacts of FDI flows also depend on the absorptive capacities in the host economies. This impact, for instance, is higher in more open economies (Nair-Reichert and Weinhold, 2001) and developed financial markets (Alfaro et al., 2004).

Powell et al., (2002) find that lower aggregate inflows and higher outflows lead to a decrease in growth. Bailliu et al., (2000) and Soto (2000) report that it is required to have developed financial system to provide positive growth impact of capital flows. Mody and Murshid (2011) find that the positive relation between capital flows and income per capita

growth is stronger in countries that have less volatile growth. Leblebicioğlu et al., (2015) suggest that the impact of financial flows on economic growth is higher in more developed financial markets. Slesman et al., (2019) report that the impact of aggregate capital flows and thus finance on growth is positive in countries that have better political institutions.

The recent literature contains also some important studies attempting to explain the consequences of extreme movements in capital flows (surges). Some of these studies explore the consequences of capital flows in sectoral levels. For instance, Teimouri and Zietz (2018) investigate the consequences of surges and find that these episodes can be negatively affect the long-run growth projections in high income countries. Also, the findings of the authors suggest that the impacts of these episodes do not lead to de-industrialization[1] in high-income countries. However, surges lead to de-industrialization in middle income countries. Benigno et al., (2015) explains the consequences of large capital inflows at the sectoral level and suggest that large inflows lead to the reallocation of labor and capital from tradable (agriculture and manufacturing) to the non-tradable (services) sector. Caselli et al., (2010) indicate that keeping growth of public expenditure at the steady levels provide a soft landing in growth following the end of surge episodes. Alfaro (2003) explains the growth impact of FDI flows in sectors and finds that it is negatively associated in primary sector, positively related in manufacturing sector and it has an ambigious effect in the services sector. Rajan and Zingales (1998) report that industries that depend on foreign capital grow faster than the others in countries that have developed financial markets. The findings of Igan et al., (2017) suggest that more external finance dependent industries grow faster than less external finance dependent industries in the pre-crisis period. Prasad et al., (2007) conclude that current account balance is positively associated with growth in non-industrial countries. This finding suggests that reliance on domestic savings is growth-enhancing since immaturity of financial markets and fear of appreciation pressures limit the beneficial impacts of foreign capital. In this vein, Cavallo et al., (2018) remark the importance of financing domestic investment with domestic savings rather than foreign savings since when the latter come to the end the impact of long-term losses outweights the short-term gains. On the other hand, Gente et al., (2015) find that the impact of capital inflows on growth is greater in high saving countries.

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[1] De-industrialization refers to the declining share in both of the manufacturing employment and/or output.

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The recent literature also focus on the consequences of the other main components of capital inflows (i.e. portfolio equity and other investment inflows). The findings by Aizenman and Sushko (2011), for instance, suggest that net portfolio equity and debt flows decelerate, but net FDI flows accelerate the manufacturing sector growth. Converse (2018) reports that, in the presence of maturity mismatch, volatility of capital flows leads to the volatility in growth and total factor productivity. The results of Converse (2018) suggest that volatility of portfolio flows decreases investment and growth, while level of portfolio flows enhances growth and investment. Choong et al., (2010) conclude that FDI, debt and portfolio inflows are all positively associated with growth in countries with more developed stock markets. Slesman et al., (2015) find that portfolio equity, FDI and debt inflows are positively associated with growth in countries that have better institutions.

4.2   The Empirical Growth Equations: A Brief Discussion

The Solow model provides an important starting point for the bulk of the growth literature. In the seminal paper published in (1956), Solow suggests that saving and population growth rates determine the steady-state level of income per capita. The Solow growth model maintains that there is constant returns to scale in the economy and the technological change proxied by the intercept term in the standard Cobb-Douglas production function is given and thus *exogeneous* over time. The Solow *exogeneous* growth model, in this context, does not provide an explanation for the causes and consequences of technology changes over time. Maintaining that, the economies have the same aggregate production function, the Solow model predicts the different initial levels of per capita income will gravitate to a similar level of income, i.e. income *convergence*. The Solow model also predicts that an increase in the saving rate leads to higher steady-state level of income per capita while higher population growth results with a decrease in steady-state level of income per capita.

The recent growth models, often termed as *endogeneous* growth models, pioneered by Mankiw et al., (1992), however, postulate that technology and total factor productivity and thus the production functions may not be the same for all countries. These endogeneous growth models mainly attempt to answer the causes of different capital and productivity growth rates across countries. In these *endogeneous* growth models, technology differs from

the conventional Solowian production inputs of capital and labor and consequently, policies to promote total factor productivity growth such as building physical infrastructure, increasing the knowledge and skills, encouraging research and development and enhancing institutional quality and governance.

Macroeconomic growth models explain the main driving forces of economic growth by attributing a special importance to exogenous or endogenous variables (like technology, research and development expenditures, saving rate and population, etc.) and thus, provide the basis of exogenous and endogenous growth models. The main difference between these growth theories lies in the assumption of the presence or absence of diminishing returns to factors of production (Barro and Sala-i Martin, 2004). On the other hand, exogenous growth models suggest that factors of production are subject to diminishing returns and this assumption causes to the convergence that shows how fast a country reaches its steady-state income per capita level as compared to initial income. At this point, Mankiw et al., (1992) finds that the incorporation of some domestic endogenous variables into the Solow model provides a better understanding of the growth dynamics. The main findings of Mankiw et al., (1992) support the postulation that cross-country differences in income per capita can be explained by considering the differences in saving, human capital, education and population growth. The results by Barro (1991) also suggest that growth rate of real per capita GDP increases with higher level of human capital, political stability, lower level of initial income, less government consumption and a decrease in market distortions. By considering the time dimension of the data, Barro (2015) investigates the impact of "modernization" on economic growth and finds that this impact is positively significant in the OLS procedure and vanishes in the fixed effects method. Barro (2015) defines modernization as economic development that encourages democratic institutions. Barro (2015) further suggests that the econometric problems caused by fixed effects are overcomed by extending the time dimension of the data.

The seminal contributions of Barro (1991) and Mankiw et al., (1992) have been centered on the estimation of the following benchmark growth regression by employing the cross-section analysis.

$$y_i = \alpha + \beta y_0 + \gamma X_i + \varepsilon_i \tag{4.1}$$

In Eq. (4.1), y_i is the income per capita, y_0 is the initial income, X_i is the set of explanatory variables. Considering the Eq. (4.1), the main criticisms have been focused

on two issues: common technology parameter assumption and the correlation among the explanatory variables (Durlauf, Johnson, & Temple, 2005).

Islam (1995) is the first study which incorporates the time-series dimension of the data into growth regression equations. According to Islam (1995), business cycle fluctuations and serial correlation are reduced by averaging the data in non-overlapping five-years periods. Islam (1995) considers the following benchmark equation.

$$y_{it} = \mu_i + \alpha y_{i,t-1} + \beta X_{it} + e_{it} \tag{4.2}$$

In Eq. (4.2), i and t are, respectively, country and time, y_{it} is the real GDP per capita, X_{it} is the set of control variables and μ_i is the individual fixed effects. In contrast to the earlier empirical studies that assume identical production functions, Islam (1995) argues that countries differ in terms of their production functions and thus suggests to employ panel fixed effects estimation procedure. Caselli et al., (1996) reports that the estimation of growth regressions with lagged dependent variable and individual fixed effects causes to an endogeneity problem. Caselli et al., (1996) proposes to use the difference GMM procedure to tackle this issue and to obtain consistent estimators. Bond et al., (2001) indicates that difference GMM estimators are biased when the instrument set is weak and hence, propose to use system GMM method in explaining the sources of growth. Lee et al., (1997) and Durlauf et al., (2005) note that empirical growth models based on cross-section regressions or panel data models that use some time series (such as five-years) averages of the data are both unable to capture the dynamic adjustment in income and total factor productivity levels.

Table 4.1 reports explanatory variables most widely used by growth studies following the seminal contribution by Barro (1991). In the table, Y_0 is the initial income, HC is the human capital, G. Cons. is government consumption, Political Ins. is the political instability to represent institutions. The column Int. reports whether these studies contain also an intercept term. The most commonly used other variables are summarized in the additional variables column. Sala-i Martin (1997) investigates the determinants of economic growth by using 62 different explanatory variables and running 2 million regressions. The findings by Sala-i Martin (1997) suggest that a large number of variables can be closely associated with growth. As reported by Table 4.1, there is also a very wide range of additional variables including inflation, investment, population, saving, risk premium, terms of trade, life

expectancy, fertility, governance, law and order, openness, democracy, among many more, to explain growth[2]. The common point of the growth studies including those reported in Table 4.1 is their overemphasize of the convergence postulation (Eberhardt et al., 2011). Eberhardt and Teal (2011) also state that the bulk of the empirical growth literature mainly focuses on the convergence and does not pay enough attention to the main determinants of growth. In this context, the authors suggest that a credible growth regression should also consider both the heterogeneity and time-series dimension of the data.

The empirical literature defines the convergence[3] as a concept that shows how fast a developing/emerging country reaches to steady-state per capita income level of high income countries as compared to their initial income levels. Most of the growth studies use the initial income as one of the basic explanatory variables in the main growth regressions to estimate whether there is convergence or not. The most common definitions of initial income in the literature is listed by Table 4.2. The initial income has been defined as either the log. of initial income in the beginning of the sample period or the log. of lagged per capita GDP. Note that, in the presence of an initial income variable which is often constant for individual countries, the estimation of the conventional models with an intercept term by employing a cross-section fixed effects procedure is not feasible due to perfect multicollinearity. Also, this may result in an identification problem as the initial income coefficient may indeed be representing the intercept term rather than convergence. Because of these, the empirical models containing a constant initial income variable do not include an intercept term.

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[2] It is worth noting that many studies consider consumption, investment, government consumption, export and imports as amongst the variables to explain growth. As all these are indeed components of income, such a specification may be interpreted as postulating the main parts of the GDP identity to explain GDP growth, and consequently may be misleading.

[3] According to Barro (2015), the convergence rate per year is measured as $\lambda = \frac{1-\alpha}{\tau}$, where α is the coefficient of the initial income variable and τ is the time period.

Table 4.1: An Overview of The Empirical Growth Equations

Basic Growth Variables in Barro (1991)							
Authors	GDP Definition	Yo	HC	G.Cons.	Additional Var.	Int.	Method
Barro (1991), Table I	Average RGDP growth in 1960-1985	-, sign.	+, sign.	-, sign.	-Political Ins. (-, sign.) -Inflation (-, sign.)	Yes	Cross-Section
Mankiw et al., (1992), Table V	Log GDP per-working age person in 1985	-, sign.	+, sign.		-Investment (+, sign.) -Population (-, sign.)	Yes	Cross-Section
Islam (1995), Table IV	Log GDP per capita (five year averages)	+, sign.			-Saving (+, sign.) -Population (-, sign.)	No	Fixed Effect
Caselli et al., (1996), Table IV	Log. dif. of RGDP (five year averages)	-, sign.	-Male (-, sign.) -Female (+, sign.)	+, sign.	-Political Ins. (-, sign.) -Investment (+, sign.) -Premium (-, sign.) -Terms of Trade (+, sign.) -Life expec. (-, insign.)	No	Dif. GMM
Sala-i Martin (1997), Table I	GDP Growth	-	-	-	-Regional Dummy (sign.) (SSAand LA,- ; Absolute Latitude,+) -Rule of law (+, sign.) -Political ins. (-,sign.) -Religion (sign.) (Confucian, Budhist, Muslim, + Protestant, Catholic, -) -Market Distortions (-,sign.) -Equity and Non-Equity Investment (+, sign.) -Primary sector production(sign.) (Fraction of primary products in total exports -; Fraction of GDP in mining +) -Openness (+,sign.) -Degree of Capitalism (+, sign.) -Former Spanish Colony (-, sign.)	-	Extreme Bound Analysis

Table 4.1: (cont'd)

Authors	GDP Definition	Yo	HC	G.Cons.	Additional Var.	Int.	Method
Barro (2015), Table I	RGDP growth (five year averages)	-, sign.	-Male (-, insign.) -Female (+, insign.)	-, insign.	-Life expec. (-, sign.) -Fertility (-, sign.) -Law & order (+, sign.) -Investment (+, sign.) -Openness(+, sign.) - ΔTerms of trade (+, sign.) -Democracy (+, insign.) - Democracy^2(-, sign.) -Inflation (-, sign.)	No	OLS by controlling time effect
Acemoğlu et al., (2019), Table II	Log. of RGDP	1st lag, (+, sign.) 2nd lag, (-, sign.) 3rd lag, (-,insig.) 4th lag, (-,sign.)	-	-	-p-value, lags 5-8 Long-run effect of democracy (+,sign.) -Effect of democracy after 25 years(+,sign.) -Persistence of GDP process, (+, sign.)	-	Fixed effects by controlling time effect

Notes: RGDP is the abbreviation for the real GDP per capita. SSA and LA denote, respectively, Sub-Saharan Africa and Latin America. In the Table, +/- indicates the direction of the relationship and sign./insign. implies the relation is significant/insignificant.

Table 4.2: The Definitions of Initial Income in the Growth Literature

Authors	Definitions
Barro (1991)	Real per capita GDP in 1960
Mankiw et al., (1992)	Log of GDP per working-age person in 1960
Islam (1995)	Logarithm of lagged per capita GDP
Caselli et al., (1996)	Logarithm of lagged per capita GDP
Barro (2015)	Logarithm of lagged per capita GDP
Acemoğlu et al., (2019)	The first four lags of log. GDP per capita

4.3 Capital Inflows and Growth in Emerging Market and Developing Economies (EMDE)

4.3.1 The Augmented Conventional Model and Estimation Procedures

To investigate the impacts of gross capital inflows and their main components on growth, we first consider the following benchmark equation:

$$\Delta y_{it} = \alpha_0 + \alpha_1 y_{i,1995} + \alpha_2 HC_{it} + \alpha_3 CIF_{it} + \alpha_4 vix_t + \alpha_5 FD_{it} + u_{it} \qquad (4.3)$$

Eq. (4.3) is in line with the conventional economic growth literature augmented with the global financial conditions variable (vix). In (4.3), the subscript i and t denote, respectively country and time, Δy_{it} is the log. difference of real GDP per capita (RGDP) in constant 2010 US dollars[4], $y_{i,1995}$ is the log. of real GDP per capita in 1995, HC is the human capital index of the Penn World Table version 9.0 (Feenstra et al., 2015), CIF_{it} is gross capital inflows scaled by GDP in current US dollars, vix_t is the log. of VIX (Chicago Board Options Exchanges equity option volatility index) as a proxy to global financial conditions and FD_{it} is financial development index of Svirydzenka (2016). The financial development index considers both size and liquidity of financial institutions and markets and lies between zero and one, with higher values denoting higher development. Initial income ($y_{i,1995}$) and human capital (HC_{it}) in (4.3) are the most commonly used drivers of growth. Rey (2015, 2016) convincingly argues that the VIX index proxies global financial cycle which is closely associated with capital

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[4] The main data source for real GDP per capita in 2010 US dollars is the World Development Indicators, World Bank.

flows, credit growth and asset prices. Kose et al., (2012) and Erdem and Özmen (2015) state that global financial conditions proxied by VIX is one of the most important determinants of economic growth and business cycles in developing economies. Therefore, we include VIX into the Eq. (4.3). King and Levine (1993) and Levine (2005) suggest that financial development and better financial intermediation are important drivers of economic growth. Levine (2005) argues that financial development promotes investment and economic growth by facilitating better productive allocation of resources and risk diversification. Hermes and Lensink (2003), Hussain and Kimuli (2012) also emphasize the importance of financial development as an indicator of productivity growth, dissemination of foreign technology and accumulation of capital. Considering all these studies, Eq. (4.3) contains also financial development index (FD_{it}).

Following the conventional literature, we first estimate Eq. (4.3) by employing panel least squares and panel fixed effects procedures for an unbalanced panel of 37 EMEs[5] and 15 DEs[6] over the annual sample from 1995 to 2015. The choice of the sample is mainly determined by data availability. The following section considers the potential endogeneity of the explanatory variables and presents the estimation of Eq. (4.3) by employing two-step system GMM estimation procedure. In Chapter 4.5, we consider the integration and co-integration properties of the variables, which is often ignored by the conventional growth literature and report the long-run relationships between the variables.

Table 4.3 reports the panel least squares estimation results for Eq. (4.3). Following the most of the literature, we consider Δy_{it} as the dependent variable in equations 4.3.1-4.3.4 in the table. Cline (2015, p.5) suggests that "testing cross-country growth patterns without permitting a comparable cross-country level of real per capita income is a classic instance of staging Hamlet without the Prince of Denmark". Therefore, we use also the log. difference of real GDP per capita purchasing power parity (Δy_{it}^{ppp}) in constant 2011 US dollars in Eq. 4.3.5

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[5]   We use the classification of Morgan Stanley Capital International Index to define the economies as emerging market and developing economies. Emerging market economies are Argentina, Bangladesh, Botswana, Brazil, Bulgaria, Chile, China, Colombia, Croatia, Czech Republic, Egypt, Estonia, Hungary, India, Indonesia, Israel, Jamaica, Jordan, Kazakhstan, Kenya, Korea Republic, Lithuania, Malaysia, Mexico, Nigeria, Pakistan, Peru, Philippines, Poland, Romania, Russia, Serbia Republic, Slovak Republic, Slovenia, South Africa, Thailand and Turkey.

[6]   Developing economies consist of Burkina Faso, Costa Rica, Cote d'Ivoire, Ecuador, Latvia, Malawi, Mali, Moldova, Mongolia, Niger, Senegal, Togo, Ukraine, Uruguay, Venezuela.

to provide a robustness check. In the equations, the level of real GDP per capita (RGDP) in constant 2010 US dollars at 1995 ($y_{i,1995}$) is taken as to represent initial income.

Table 4.3: The Augmented Conventional Model: Panel Least Squares Estimation Results

Dependent Variable:	Δy_{it}				Δy_{it}^{ppp}
Equation	(4.3.1)	(4.3.2)	(4.3.3)	(4.3.4)	(4.3.5)
Constant	0.147***	0.139***	0.137***	0.131***	0.144***
	(0.018)	(0.014)	(0.014)	(0.017)	(0.022)
$y_{i,1995}$	-0.008***	-0.007***	-0.007***	-0.006***	
	(0.002)	(0.002)	(0.002)	(0.002)	
$y_{i,1995}^{ppp}$					-0.006**
					(0.003)
HC_{it}	0.015***	0.010***	0.011***	0.009***	0.009***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Portfolio_Inflows$_{it}$	0.027			0.029	0.026
	(0.060)			(0.058)	(0.058)
FDI_Inflows$_{it}$		0.129***		0.124***	0.125***
		(0.031)		(0.036)	(0.036)
Other_Inv._Inflows$_{it}$			0.116***	0.170***	0.169***
			(0.022)	(0.027)	(0.027)
vix_t	-0.034***	-0.031***	-0.031***	-0.032***	-0.032***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
FD_{it}	0.023**	0.029***	0.031***	0.027***	0.026***
	(0.010)	(0.008)	(0.008)	(0.010)	(0.008)
NT	846	1141	1134	846	846
N	52	59	59	52	52
R^2	0.101	0.109	0.117	0.161	0.159
F-statistic	18.847	27.851	29.935	22.898	22.597
[p-value]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]

Notes: Standard errors are in the parentheses. * significant at 10%; ** significant at 5%, *** significant at 1%. NT shows the total number of observations; N shows the number of cross section units.

Equations 4.3.1 - 4.3.3 presents our estimation results, respectively, for the impacts of portfolio equity, FDI and other investment inflows. Equation 4.3.4 considers the joint effects of these capital inflows variables on growth. In Eq. 4.3.5, following Cline (2015), we consider real GDP per capita purchasing power parity (Δy_{it}^{ppp}).

The estimated coefficients of initial income ($y_{i,1995}$) varies between -0.006 and -0.008, negative and statistically significant in the all equations in Table 4.3. The implied conditional convergence rates are around 0.6% and 0.8% range per year. The association between human capital and growth is positive and significant in the equations indicating that the impacts of human capital on economic growth are expansionary. This result supports the postulation of Mankiw et al., (1992) and Barro (2001) suggesting that human capital is one of the most important determinants of economic growth.

The findings by Kose et al., (2012) and Erdem and Özmen (2015) suggest that global financial conditions proxied by VIX is one of the crucially important determinants of economic growth. Supporting these conclusions, we find that the coefficient of vix is negative and statistically significant in equations 4.3.1-4.3.4 suggesting that better global financial conditions and greater risk aversion are positively associated with growth.

King and Levine (1993) and Levine (2005) report that financial development and better financial intermediation are significant determinants of economic growth. Consistent with these results, we find that the relation between financial development and growth is significantly positive in all the equations in Table 4.3 suggesting that an increase in the size and liquidity of financial markets leads to the increase in economic growth.

Eq. 4.3.1 in Table 4.3 reports the estimation results for the impact of portfolio equity inflows on growth (Δy_{it}). The results suggest that the estimated coefficient of portfolio equity inflows is positive, but not statistically significant. The literature provides mixed results for the growth impacts of portfolio flows. Aizenman and Sushko (2011), for instance, find that net portfolio equity and debt flows decelerate manufacturing sector growth. On the other hand, Choong et al., (2010), Slesman et al., (2015) and Converse (2018) all report that higher portfolio inflows lead to higher growth.

Adams (2009) suggests that FDI improves the total factor productivity and thus, increases the economic growth. Kose et al., (2009) find that FDI promotes total factor productivity. Borensztein et al., (1998) finds that FDI promotes growth in EMDE only when the host country has a minimum threshold of human capital. Baharumshah et al., (2006) report that FDI and economic growth are positively associated both in the short-run and long-run. The findings of Aizenman et al., (2013) suggest that lagged FDI raises the economic growth and

provide a support for the postulation that some types of capital flows are more desirable than the others. Choong et al., (2010) state that FDI is growth enhancing in countries with more developed stock markets. Slesman et al., (2015) report that FDI flows are positively related with economic growth in countries that have better institutions. Alfaro et al., (2004; 2016) indicate that growth-enhancing impacts of FDI is higher in countries that have developed financial markets, better domestic conditions and policies. Consistent with all these findings, the results by Eq. (4.3.2) of Table 4.3[7] strongly suggest that FDI inflows are growth enhancing in EMDE.

Ghosh et al., (2016) report that other investment inflows are associated with macroeconomic imbalances and financial vulnerability. Durham (2003) does not find a significant association between other investment flows and growth. Reisen and Soto (2001) suggest that the growth enhancing impact of other investment flows depends on the capitalization ratio of domestic banks and find that other investment flows result with lower growth. On the contrary to Ghosh et al., (2016), Durham (2003) and Reisen et al., (2001), the estimation results in Eq. (4.3.3) suggest that the impact of other investment inflows are expansionary for EMDEs.

Equation 4.3.4 considers the joint effects of these capital inflows variables on growth. The results presented by eq. 4.3.4 are virtually the same with those reported by equations 4.3.1, 4.3.2 and 4.3.3. Consequently, our results tend to be robust to the inclusion of the main components of capital inflows seperately. In Eq. 4.3.5[8], following Cline (2015), we consider real GDP per capita purchasing power parity (Δy_{it}^{ppp}). The results appear essentially to be the same with those reported by Eq. 4.3.4. Therefore, our findings may be interpreted as being robust also to the use of Δy_{it}^{ppp} and Δy_{it}.

4.3.1.1   Panel Fixed Effects Results

The literature often considers an initial income variable which is, indeed, constant for all the cross-sections. The use of panel least squares procedure allows us to use of initial in-

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[7]   FDI and other investment flows data are available for more cross-section units. Therefore, the sample for the estimation of the equations 4.3.2 and 4.3.3 contains also observations for Bolivia, Dominican Republic, El Salvador, Guatemala, Honduras, Morocco and Swaziland.

[8]   In Eq. (4.3.5), initial income corresponds to the log. of real GDP per capita purchasing power parity in 1995.

come along with an intercept term. This is not feasible, however, for the fixed effect procedure as the inclusion of constant term along with initial income leads to perfect multicollinearity problem. Furthermore, this may also result in an identification problem as the initial income coefficient may indeed be representing the intercept term rather than convergence. Because of this, the bulk of the studies using a constant initial income for the cross-sections does not provide an intercept term estimation. Therefore, equations reported by Table 4.4 do not contain a seperate intercept term.

We now proceed with the estimation of following equation[9] by using panel fixed effects procedure:

$$\Delta y_{it} = \alpha_i + \alpha_1 y_{i,t-1} + \alpha_2 HC_{it} + \alpha_3 CIF_{it} + \alpha_4 vix_t + \alpha_5 FD_{it} + u_{it} \qquad (4.4)$$

Following Islam (1995), Caselli et al., (1996) and Barro (2015), we include $y_{i,t-1}$ to proxy initial income. The results from the panel fixed effects procedure tend to be essentially the same with those from the panel least squares. Portfolio inflows are again found to be statistically insignificant. The estimated coefficients for FDI and other investment inflows reported in Table 4.3 and Table 4.4 are almost identical to each other. This suggests that the impacts of FDI and other investment flows are expansionary. Compared to equations 4.3.2 and 4.3.3, the impacts of human capital (HC) and financial development (FD) are substantially higher in Table 4.4. This may indeed be the result of the different definitions of initial income in the tables. Our results appear to be robust to the inclusion of the main components of capital inflows jointly (Eq. 4.4.4) and to the use of Δy_{it}^{ppp} and Δy_{it} (Eqs. 4.4.4 and 4.4.5).

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[9] Durlauf et al., (2005) suggest that the bulk of the growth literature employs panel fixed effects since this method provides unbiased estimators even if the omitted variables that are constant over time and they are uncorrelated with the regressors.

Table 4.4: The Augmented Conventional Model: Panel Fixed Effects Estimation Results

Dependent Variable:	Δy_{it}				Δy_{it}^{ppp}
Equation:	(4.4.1)	(4.4.2)	(4.4.3)	(4.4.4)	(4.4.5)
α_i	0.733***	0.546***	0.548***	0.696***	0.756***
	(0.072)	(0.059)	(0.058)	(0.070)	(0.076)
$y_{i,t-1}$	-0.091***	-0.070***	-0.072***	-0.090***	
	(0.011)	(0.009)	(0.009)	(0.010)	
$y_{i,t-1}^{ppp}$					-0.090***
					(0.010)
HC_{it}	0.050***	0.049***	0.053***	0.060***	0.060***
	(0.015)	(0.013)	(0.013)	(0.015)	(0.015)
Portfolio_Inflows$_{it}$	0.025			0.048	0.048
	(0.058)			(0.056)	(0.056)
FDI_Inflows$_{it}$		0.149***		0.102**	0.102**
		(0.034)		(0.040)	(0.040)
Other_Inv._Inflows$_{it}$			0.130***	0.190***	0.190***
			(0.022)	(0.027)	(0.027)
vix_t	-0.037***	-0.032***	-0.031***	-0.035***	-0.035***
	(0.004)	(0.003)	(0.003)	(0.004)	(0.004)
FD_{it}	0.133***	0.115***	0.116***	0.098***	0.098***
	(0.028)	(0.025)	(0.024)	(0.027)	(0.027)
NT	846	1141	1134	846	846
N	52	59	59	52	52
R^2	0.301	0.266	0.277	0.352	0.352
F-statistic	6.063	6.211	6.494	7.357	7.357
[p-value]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]

Notes: Standard errors in parentheses. *significant at 10 percent, ** significant at 5 percent, *** significant at 1 percent. NT shows the total number of observations, N shows the number of cross section units.

4.4 Capital Inflows and Growth: GMM Estimation Results

We consider the following benchmark equation:

$$\Delta y_{it}^{ppp} = \alpha_i + \alpha_1 y_{i,t-1}^{ppp} + \alpha_2 HC_{it} + \alpha_3 CIF_{it} + \alpha_4 vix_t + \alpha_5 FD_{it} + u_{it} \qquad (4.5)$$

As already presented in the earlier sections, the subscript i and t denote, respectively country and time, Δy_{it}^{ppp} is the log. difference of real GDP per capita purchasing power parity adjusted in constant 2011 US dollars, $y_{i,t-1}^{ppp}$ is the log of lagged per capita GDP in purchasing

power parity, CIF_{it} is the gross capital inflows scaled by GDP in current US dollars, HC is the human capital index of the Penn World Table version 9.0 (Feenstra et al., 2015), vix_t is the log. of VIX as a proxy to global financial/liquidity conditions and FD_{it} is the financial development index of Svirydzenka (2016).

The conventional procedures such as panel least squares and panel fixed effects employed in Chapter 4.3 maintains that the explanatory variables are not endogeneous and they are not correlated with the disturbance term. The correlation between the error term and lagged dependent variable does not vanish mainly due to the time-invariant country-specific component of the error term. In dynamic models like Eq. 4.5, generalized method of moments (GMM) estimation procedure introduced by Holtz-Eakin et al., (1988), Arellano and Bond (1991), Arellano and Bover (1995) may be more appropriate since this procedure provides consistent estimators by considering the endogeneity issue. Alonso-Borrego and Arellano (1999) and Blundell and Bond (1998) suggest that first difference GMM procedure developed by Arellano and Bond (1991) may be subject to a weak instrument problem when explanatory variables are persistent over time. At this point, Arellano and Bover (1995) and Blundell and Bond (1998) developed the system GMM procedure that associates the regression in differences and levels in a system. The instruments for the regression in differences are the lags of the variables in level form and the instruments for the regression in levels are the lags of the variables in difference form.

In this part of the study, we address the simultaneity issue along with the inclusion of the lagged dependent variable by employing two-step system GMM procedure. Table 4.5[10] reports the two-step system GMM estimation results with Windmeijer adjusted standard errors in explaining the growth impacts of main components of capital flows that specified in Eq. (4.5). We prefer to use orthogonal deviations instead of first-difference transformation because the sample is unbalanced[11]. It may be plausibly argued that the country-specific variables (human capital and financial development) are potentially endogenous for the evolution of growth. Furthermore, as already reported by the earlier chapter (Ch. 3), capital inflows are often pro-cyclical. That is, the main pull factor, domestic growth, enhances capital inflows.

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[10] We obtain almost similar results when we change the dependent variable from Δy_{it}^{ppp} to Δy_{it}.

[11] Roodman et al., (2005) state that the first difference transformation increases the gaps in unbalanced data.

Therefore, we maintain that all the capital inflow variables are also potentially endogeneous. The main push factor, the VIX index is treated as exogenous.

In the estimation, we use all the available t-1 and t-3 dynamic lags of potential endogeneous variables, portfolio equity, FDI and other investment inflows, financial development and human capital as instruments. As noted by Bond (2002), the maintained endogenous variables should be treated symmetrically with the dependent variable, therefore we specify exactly the same dynamic lag structure for the instruments for the dependent variable (purchasing power parity adjusted real GDP growth rate). The instrument set contains also the current values of the maintained strictly exogenous variables VIX.

The consistency of the GMM estimators and the validity of instruments crucially depend on the absence of higher-order serial correlation in the idiosyncratic component of the error term. If the disturbance in the dynamic levels equation is not serially correlated, there should be evidence of significant negative AR(1) and no significant AR(2) in the difference equation (Arellano and Bond, 1991). The equations in Table 4.5 pass all the diagnostics including the Hansen-Sargan test of over-identification restriction.

In Table 4.5, $y_{i,t-1}^{ppp}$ and $y_{i,1995}^{ppp}$ are, respectively, correspond to the log. of lagged real GDP per capita purchasing power parity from Eq. (4.5.1) to (4.5.3) and log. of real GDP per capita purchasing power parity in 1995 in Eq. (4.5.4). We consider Eq. 4.5.4, in order to, estimate the convergence factor.

According to the results presented by Table 4.5, all the components of gross capital inflows, i.e. portfolio equity, FDI and other investment flows are growth enhancing. It is worth noting that portfolio inflows, which are found to be insignificant in the conventional panel estimation procedures presented by the previous section, now become highly significant. In this context, taking into account the endogeneity of inflows which mainly arises from their pro-cyclicality appears to be important. Compared to the panel least squares and fixed effects estimation procedures, the impacts of FDI and other investment inflows tend to be much higher in the GMM results which consider their potential endogeneity. In a similar vein, the sensitivity of growth to human capital is much higher in the GMM equations. The impacts of financial development and the global financial conditions, on the other hand, remains almost the same across different estimation methods. In Eq. 4.5.4, we replace y_{it}^{ppp} with $y_{i,1995}^{ppp}$

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Table 4.5: Capital Inflows and Growth: Two-step System GMM Estimation Results

	Dependent Variable: Δy_{it}^{ppp}			
Equation:	(4.5.1)	(4.5.2)	(4.5.3)	(4.5.4)
Constant	3.031**	3.044**	3.018**	0.937**
	(0.040)	(0.025)	(0.072)	(0.049)
$y_{i,t-1}^{ppp}$	-0.599**	-0.618**	-0.622**	
	(0.001)	(0.000)	(0.002)	
$y_{i,1995}^{ppp}$				-0.081**
				(0.025)
HC_{it}	0.387**	0.389**	0.394**	0.046*
	(0.018)	(0.007)	(0.030)	(0.023)
Portfolio_Inflows$_{it}$	1.698**	1.257**	1.313**	1.098**
	(0.065)	(0.049)	(0.059)	(0.075)
FDI_Inflows$_{it}$		2.290**	2.111**	0.329**
		(0.033)	(0.075)	(0.107)
Other_Inv._Inflows$_{it}$			0.227**	0.795**
			(0.051)	(0.052)
vix_t	-0.039**	-0.051**	-0.044**	-0.236**
	(0.002)	(0.002)	(0.002)	(0.012)
FD_{it}	0.154**	0.186**	0.285**	-0.257**
	(0.037)	(0.028)	(0.058)	(0.067)
	Test Statistics			
NT	849	849	849	849
N	52	52	52	52
χ_{H-S}^2 [p-value]	0.522	0.620	0.498	0.031
m2 [p-value]	0.211	0.184	0.195	0.641
m1 [p-value]	0.003	0.003	0.003	0.003
F-Test [p-value]	0.000	0.000	0.000	0.000

Notes: NT and N show, respectively, the total number of observations and cross section units. The values in square brackets are p-values, and in brackets are the standard errors. ** and * denote, respectively, significance level at 5 and 10 percent levels. χ_{H-S}^2 is the χ^2 test of the Hansen-Sargan test for instrument validity and overidentification restrictions. m1 and m2 are the asymptotically normally distributed first and second order serial correlation test of the Arellano and Bond (1991).

in order to be able to estimate the convergence parameters. The convergence parameter is estimated as 0.081 which implies a 8.1% annual growth, which may, indeed, be interpreted as relatively high. Considering the fact that the equation contains also an intercept term, the coefficient of $y_{i,1995}^{ppp}$ may better be interpreted as cross-sectional differences from the mean domestic growth rates. Consequently, the interpretation of the $y_{i,1995}^{ppp}$ as the convergence indicator may better be taken with a caution. The equation also fails to pass the Hansen-Sargan

test of overidentification restrictions.

4.5 The Long-Run Consequences of Capital Flows

In the earlier sections, we first considered the most commonly used panel estimation procedures, namely panel fixed effects and panel least squares, to estimate the consequences of capital inflows in EMDE. We argued that, the results, albeit broadly in line with the recent growth literature, may better be interpreted with a caution as these estimation procedures do not take into account the potential endogeneity of explanatory variables especially arising from the pro-cyclicality of capital inflows. This potential endogeneity problem is tackled with the estimation of basic model by employing two-step system GMM procedure. We found that, the results from each of these methods are not substantially different from each other. All these procedures, however, may be criticised as they do not consider the recent advances of panel data estimation methods which take into account the integration and co-integration properties of the variables. In this section, we attempt to provide a further contribution to the prevailing literature by investigating the long-run consequences of capital inflows by employing the fully-modified OLS (FM-OLS) and panel autoregressive distributed lag (PARDL) estimation methods.

Given that real GDP per capita growth variables (Δy_{it}^{ppp} and Δy_{it}) are stationary (I(0)) and all or some of the other variables are integrated of order one (I(1)), Eq. 4.3 is unbalanced and thus the results of conventional estimation procedures may not be reliable. In the same vein, Eberhardt et al., (2011) remark that the bulk of the growth literature often ignores the integration and cointegration properties of the variables and estimates unbalanced equations including I(1) and I(0) variables. Therefore, we now proceed with the investigation of long-run impacts of capital flows on growth. To this end, we first consider the following benchmark equation:

$$y_{it}^{ppp} = \alpha_0 + \alpha_1 HC_{it} + \alpha_2 vix_t + \alpha_3 FD_{it} + \alpha_4 CIF_{it} + u_{it} \tag{4.6}$$

In (4.6), y_{it}^{ppp} is the log. of real GDP per capita purchasing power parity in constant 2011 US dollars, HC_{it} is the human capital index, vix_t is the log. of VIX as a proxy to global financial conditions, FD_{it} is the financial development index of Svirydzenka (2016) and CIF_{it} is the gross capital inflows scaled by GDP in current US dollars.

Pedroni (2007, p.433) notes that, "because the residuals of the cointegrating relationship are stationary mean zero processes, this implies that any differences among the residuals are temporary. Thus, the cointegrating relationship picks out those features upon which it is necessary to condition in order for per capita outputs to be conditionally convergent in the sense that any remaining differences are only transitory.". Pedroni (2007) also suggests that the stationary residuals of the real income equation (i.e., the existence of cointegration) is a necessary condition for conditional income convergence. Therefore, as Pedroni (2007) argues, there is no need to specify a lagged dependent variable (initial income) term as in the conventional growth equations. Moreover, the estimation of cointegrating equation with an initial income variable is not feasible. Thus, we do not include this variable in Eq. (4.6).

Table 4.6 reports the results of Levin et al., (2002) panel unit root tests for the panel variables and augmented Dickey-Fuller test for vix. The unit root test results suggest that all variables in Eq. (4.6) are I(1).

Considering the potential endogeneity of the explanatory variables for the evolution of growth, we estimate Eq. (4.6) by employing fully-modified OLS (FM-OLS) procedure (Pedroni, 2001). The FM-OLS method considers the heterogeneity in the long-run relationships along with endogeneity and serial correlation. Given that there is a cointegration, FM-OLS procedure provides super-consistent parameter estimates even in the presence of endogeneity and serial correlation.

Table 4.7 reports the FM-OLS results for Equation (4.6)[12] for the main components of capital flows. The panel unit root test results of Levin et al., (2002) imply that the equation residuals are stationary. Therefore, the equations in Table 4.7 may be interpreted as representing a long-run equilibrium relationships i.e., cointegration.

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[12] When we use y_{it} as dependent variable, we obtain almost the same results. We do not report the estimation results to save the space, but available upon the request.

Table 4.6: Panel unit root test results

Variables	LLC	
	Level	First Difference
y_{it}	0.044[0]	-21.625[0]**
y_{it}^{ppp}	0.044[0]	-21.625[0]**
HC_{it}	1.388[0]	-3.017[0]**
Portfolio_Inflows$_{it}$	1.529[3]	-24.536[1]**
FDI_Inflows$_{it}$	1.569[4]	-14.407[2]**
Other_Inv._Inflows$_{it}$	2.603[4]	-9.545[2]**
Capital_Inflows$_{it}$	0.106[2]	-12.102[1]**
FD_{it}	-1.330[2]	-23.259[1]**
ROL_{it}	1.290[4]	-11.529[2]**
$TRADE_{it}$	-0.197[3]	-25.355[1]**
$KAOPEN_{it}$	15.363[5]	-11.061[2]**
	ADF	
vix_t	1.322[0]	-7.423[0]**

Notes: LLC and ADF are the Levin, Lin and Chu (2002) panel unit root and augmented Dickey-Fuller test, respectively. ** denotes the rejection of the unit root null at the 5 percent significance level. The values in brackets [.] are the lag lengths which may be plausible for annual data. The unit root test equations contain a constant term and trend.

The relation between human capital (HC_{it}) and economic growth is positive and statistically significant suggesting that an increase in the years of schooling and returns to education leads to the increase in growth. The impacts of capital inflows and all their main components on growth are expansionary. Better global financial conditions and greater risk appetite proxied by vix_t is associated with higher economic growth. Supporting the results of Beck et al., (2000), Levine et al., (2000) and Pagano (1993), we find that the relation between financial development and growth is positive and statistically significant suggesting that an increase in financial development leads to the increase in growth.

4.5.1   Capital Inflows, Structural Domestic Conditions and Growth

Along with human capital, the literature often suggests some other structural domestic conditions including governance and institutional quality, trade openness and financial openness are amongst the main determinants of growth. In this section, we first consider each of

Table 4.7: The Long-Run Consequences of Capital Inflows: FM-OLS Results

	Dependent Variable: y_{it}^{ppp}			
Equations:	(4.6.1)	(4.6.2)	(4.6.3)	(4.6.4)
$HC_{i,t}$	0.746*** (0.021)	0.836*** (0.018)	0.852*** (0.018)	0.767*** (0.017)
Portfolio_Inflows$_{i,t}$	0.250** (0.098)			
FDI_Inflows$_{i,t}$		0.110* (0.061)		
Other_Inv._Inflows$_{i,t}$			0.211*** (0.038)	
Capital_Inflows$_{i,t}$				0.121*** (0.027)
VIX_t	-0.056*** (0.007)	-0.043*** (0.006)	-0.040*** (0.006)	-0.051*** (0.006)
$FD_{i,t}$	1.067*** (0.044)	1.095*** (0.041)	1.063*** (0.039)	1.045*** (0.036)
R-square	0.985	0.985	0.985	0.985
LRV	0.003	0.004	0.003	0.002
N	50	59	59	55
NT	812	1139	1134	915
LLC	-10.799[0.00]	-6.545[0.00]	-6.409[0.00]	-6.650[0.00]

Notes: LRV denotes long-run variance. The values in parentheses are the standard errors. *, ** and *** denote the significance at the 10, 5 and 1 percent, respectively. N and NT are, correspondingly, the number of countries and observations for the sample. LLC is the Levin, Lin and Chu (2002) panel unit root test for the equation residuals. The optimum lag lengths for the tests are chosen by the AIC. The values in brackets [.] are the p-values for the corresponding null hypothesis. The unit root test equation contains a constant and trend terms.

these structural variables seperately. In the final part of this section, we report also the results for an equation containing of these variables jointly.

4.5.1.1 Rule of Law and Governance

In the first part, we consider governance and institutional quality. The conventional theory often indicates that higher institutional quality and governance are associated with better legal infrastructure, reinforcing property rights, encouraging transparency and accountability and decreasing adverse selection and moral hazard and in this sense, leading to the higher cap-

ital inflows and gains from international financial integration (Özmen and Taşdemir, 2019). The findings by Kose et al., (2011) suggest that, by providing a threshold, the impacts of capital flows and gains of international financial integration differ across to the level of institutional quality. Accordingly, Alfaro et al., (2008) associate the Lucas paradox with the presence of low institutional quality. This finding suggests that capital does not flow from low marginal product (rich) countries to the high marginal product (poor) countries because of the presence of low institutional quality in the latter group. Ghosh et al., (2014) report that EMEs that have high institutional quality experience much more surge episodes. Bryne and Fiess (2016) suggest that financial openness and institutional quality are important variables in explaining the drivers of capital inflows to EMEs. Eichengreen et al., (2018) state that better investment climate is related to larger FDI inflows. Özmen and Taşdemir (2019) find that the impacts of pull and push factors on capital inflows are not invariant to the endogenously determined threshold levels for structural domestic conditions denoted by governance/institutional quality, trade and financial openness. Haggard et al., (2008) suggest that the presence of the secure property rights promotes investment, resource allocation and development of financial system. Claessens and Laeven (2003) and Rigobon and Rodrik (2005) report that strengthened property rights is associated with higher growth. Acemoğlu et al., (2003) suggest that the poor macroeconomic policies may be related to the presence of weak institutions. Kaufmann and Kraay (2003) state that there is a positive association between the quality of governance and income per capita. Dunning and Zhang (2008) postulates that natural and human resource endowments along with institutional quality, the degree of trade openness and economic development provide location advantages to host economies.

To investigate the impacts of rule of law as an indicator for institutional quality on economic growth, we consider the following specification:

$$y_{it}^{ppp} = \alpha_0 + \alpha_1 HC_{it} + \alpha_2 VIX_t + \alpha_3 FD_{it} + \alpha_4 CIF_{it} + \alpha_5 ROL_{it} + u_{it} \qquad (4.7)$$

In Eq. (4.7), ROL_{it} is the rule of law based on World Bank Governance Indicators (WBGI) and it is standardized around zero mean and unit standard deviation to have values between -2.5 and 2.5 with higher values representing better institutional quality.

The estimation results of Eq. (4.7) is reported in Table 4.8[13]. We find that the impacts of rule of law on economic growth is positive and statistically significant. This result provides a support for the findings of Kose et al., (2011), Claessens et al., (2003), Rigobon et al., (2005) and Kaufmann and Kraay (2003) suggesting that the effect of better institutional environment on growth is expansionary. Compared to the results presented by Table 4.7, the inclusion of ROL as an additional variable does not lead to a considerable change in the other determinants of growth including the components of capital inflows.

Table 4.8: The Rule of Law, Capital Inflows and Growth: FM-OLS Results

	Dependent Variable: y_{it}^{ppp}			
Equations:	(4.7.1)	(4.7.2)	(4.7.3)	(4.7.4)
HC_{it}	0.814*** (0.014)	0.879*** (0.015)	0.891*** (0.014)	0.831*** (0.013)
Portfolio_Inflows$_{it}$	0.192*** (0.061)			
FDI_Inflows$_{it}$		0.132*** (0.046)		
Other_Inv._Inflows$_{it}$			0.281*** (0.028)	
Capital_Inflows$_{it}$				0.162*** (0.020)
VIX_t	-0.032*** (0.005)	-0.032*** (0.005)	-0.031*** (0.005)	-0.027*** (0.004)
FD_{it}	1.016*** (0.029)	1.052*** (0.033)	1.017*** (0.031)	1.001*** (0.028)
ROL_{it}	0.215*** (0.008)	0.147*** (0.009)	0.157*** (0.008)	0.201*** (0.008)
R-square	0.988	0.988	0.988	0.988
LRV	0.001	0.002	0.002	0.001
N	48	59	59	55
NT	759	1032	1025	865
LLC	-10.145[0.00]	-7.660[0.00]	-7.759[0.00]	-5.999[0.00]

Notes: LRV denotes long-run variance. The values in parentheses are the standard errors. *, ** and *** denote the significance at the 10, 5 and 1 percent, respectively. N and NT are, correspondingly, the numbers of countries and observations for the sample. LLC is the Levin, Lin and Chu (2002) panel unit root test for the equation residuals. The optimum lag lengths for the tests are chosen by the AIC. The values in brackets [.] are the p-values for the corresponding null hypothesis. The unit root test equation contains a constant and trend terms.

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[13] The panel unit root test results of Levin et al., (2002) imply that the equation residuals are stationary. Therefore, the equations in Table 4.8 may be interpreted as representing a long-run equilibrium relationships i.e. cointegration.

4.5.1.2 Trade Openness

Heckscher-Ohlin-Mundell model suggests that trade integration decreases the incentives for capital to move capital-scarce economies and thus, implying trade integration and capital mobility are substitutes in emerging market and developing (EMDE) economies. However, by providing a theoretical model, Antras and Caballero (2009) find that trade integration and capital mobility are complements in the presence of financial frictions. In a similar vein to the explanation of Lucas paradox by Alfaro et al., (2008), this finding suggests that trade integration is associated with greater motivations to the movement of capital to capital-scarce economies. Accordingly, by providing a theoretical model, Davis and van Wincoop (2018) find an empirical support for their postulation that higher international financial integration increases the correlation between capital inflows and outflows, while trade openness decreases the correlation between capital inflows and outflows. Cerutti et al., (2017) suggest that the sensitivity of global push factors is higher in more open and flexible ERR countries in explaining the causes of portfolio bond inflows. Frankel and Romer (1999) indicate that trade openness increases the growth by contributing to the accumulation of human and physical capital. Dowrick and Golley (2004) find that trade openness leads to the improvement in total factor productivity.

To analyse the impacts of trade openness on economic growth, we consider the following specification:

$$y_{it}^{ppp} = \alpha_0 + \alpha_1 HC_{it} + \alpha_2 VIX_t + \alpha_3 FD_{it} + \alpha_4 CIF_{it} + \alpha_5 TRADE_{it} + u_{it} \qquad (4.8)$$

In Eq. (4.8), $TRADE_{it}$ is the trade openness (sum of exports and imports of goods and services, as a percent of GDP) and the data are from World Development Indicators.

The estimation results of Eq. (4.8) are presented in Table 4.9. We find that the association between trade openness and economic growth is positive and statistically significant. Consistent with the findings of Frankel and Romer (1999), we find that the impacts of trade openness on growth is expansionary[14]. As with the inclusion of rule of law, the augmentation of our basic equation 4.6 with trade openness does not alter our earlier results.

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[14] The panel unit root test results of Levin et al., (2002) imply that the equation residuals are stationary. Therefore, the equations in Table 4.9 may be interpreted as representing a long-run equilibrium relationships.

Table 4.9: Trade Openness, Capital Inflows and Growth: FM-OLS Results

	Dependent Variable: y_{it}^{ppp}			
Equations:	(4.8.1)	(4.8.2)	(4.8.3)	(4.8.4)
HC_{it}	0.702***	0.802***	0.808***	0.732***
	(0.018)	(0.017)	(0.016)	(0.015)
Portfolio_Inflows$_{it}$	0.290***			
	(0.082)			
FDI_Inflows$_{it}$		0.104**		
		(0.054)		
Other_Inv._Inflows$_{it}$			0.195***	
			(0.034)	
Capital_Inflows$_{it}$				0.115***
				(0.024)
VIX_t	-0.052***	-0.043	-0.041***	-0.049***
	(0.006)	(0.005)	(0.005)	(0.005)
FD_{it}	1.056***	1.068***	1.051***	1.029***
	(0.036)	(0.037)	(0.035)	(0.031)
$TRADE_{it}$	0.076***	0.075***	0.074***	0.072***
	(0.011)	(0.010)	(0.009)	(0.009)
R-square	0.985	0.986	0.986	0.986
LRV	0.002	0.003	0.002	0.002
N	48	59	59	55
NT	801	1126	1119	912
LLC	-7.078[0.00]	-6.166[0.00]	-6.239[0.00]	-6.174[0.00]

Notes: LRV denotes long-run variance. The values in parentheses are the standard errors. *,** and *** denote the significance at the 10, 5 and 1 percent, respectively. N and NT are, correspondingly, the numbers of countries and observations for the sample. LLC is the Levin, Lin and Chu (2002) panel unit root test for the equation residuals. The optimum lag lengths for the tests are chosen by the AIC. The values in brackets [.] are the p-values for the corresponding null hypothesis. The unit root test equation contains a constant and trend terms.

4.5.1.3 International Financial Openness

The findings of Levine (2001) state that a decrease in capital account restrictions and hence, higher international financial openness is associated with higher economic growth. In the same vein, Chanda (2005) indicates that prevailance of capital controls leads to a decrease in growth. Dreher (2006) finds that the international economic integration measured by the lack of trade and capital account restrictions is associated with the higher economic growth. Kose et al., (2009) suggest that financial openness leads to an increase in total factor produc-

tivity. Bussiere and Fratzscher (2008) report that financial openness is positively related with economic growth in the short-run. Broner and Ventura (2016) provide a theoretical model suggesting that, in the initial stages of development, countries discriminate between domestic and foreign financial markets. In the later stages of development, however, they should phase-out the discrimination so as to increase investment and growth. Edison et al., (2002) report that the relation between international financial integration and growth is not robust across to the alternative measures of international financial integration. The lack of robust association between capital account liberalization and growth has been led the researchers also to investigate whether this relation depends on the absorptive capacities of the economies. In this context, the impact of capital account liberalization on economic growth is higher in countries that have intermediate level of economic development (Edison et al., 2004), better institutional environment (Arteta et al., 2001) and developed financial system (Eichengreen et al., 2003). Furthermore, the empirical findings of Klein and Olivei (2008) and Quinn and Toyoda (2008) suggest that capital account liberalization is associated with higher level of economic growth in developed countries. Ghosh et al., (2014) report that more financial open emerging market economies (EME) are more likely to experience surge episodes. Similarly, Bryne and Fiess (2016) find that financial openness matters for explaining the causes of capital inflows to EMEs. Barrot and Serven (2018) suggests that higher financial openness augments countries' exposure to global financial cycle.

In this study, we use *de jure* financial openness measure of Chinn and Ito (2016). The Chinn-Ito index (KAOPEN) is based on annual reports on Exchange Arrangements and Exchange Restrictions (AREAER) published by the IMF and is available over the period 1995–2016. The KAOPEN have a value between -1.9 and 2.4 with higher values denoting more openness to cross-border capital transactions.

To investigate the effects of *de jure* financial openness on economic growth, we estimate the following equation:

$$y_{it}^{ppp} = \alpha_0 + \alpha_1 HC_{it} + \alpha_2 VIX_t + \alpha_3 FD_{it} + \alpha_4 CIF_{it} + \alpha_5 KAOPEN_{it} + u_{it} \qquad (4.9)$$

The estimation results of Eq. (4.9) are reported in Table 4.10[15]. We find that the impact of financial openness on economic growth is positive and significant. Consistent with the conclusions of Klein and Olivei (2008), Chanda (2005) and Blair (2003), we provide a support for the postulation that capital account openness leads to the increase in economic growth.

Table 4.10: Financial Openness, Capital Inflows and Growth: FM-OLS Results

	Dependent Variable: y_{it}^{ppp}			
Equations:	(4.9.1)	(4.9.2)	(4.9.3)	(4.9.4)
HC_{it}	0.730***	0.788***	0.793***	0.717***
	(0.017)	(0.015)	(0.014)	(0.014)
Portfolio_Inflows$_{it}$	0.219***			
	(0.076)			
FDI_Inflows$_{it}$		0.264***		
		(0.051)		
Other_Inv._Inflows$_{it}$			0.280***	
			(0.032)	
Capital_Inflows$_{it}$				0.179***
				(0.025)
VIX_t	-0.062***	-0.049***	-0.047***	-0.054***
	(0.006)	(0.005)	(0.005)	(0.005)
FD_{it}	0.841***	0.860***	0.843***	0.845***
	(0.036)	(0.036)	(0.032)	(0.031)
$KAOPEN_{it}$	0.021***	0.017***	0.017***	0.021***
	(0.002)	(0.002)	(0.002)	(0.002)
R-square	0.985	0.989	0.988	0.984
LRV	0.002	0.002	0.002	0.001
N	38	52	52	43
NT	678	1018	1012	755
LLC	-5.136[0.00]	-5.752[0.00]	-5.019[0.00]	-4.197[0.00]

Notes: LRV denotes long-run variance. The values in parentheses are the standard errors. *, ** and *** denote the significance at the 10, 5 and 1 percent, respectively. N and NT are, correspondingly, the numbers of countries and observations for the sample. LLC is the Levin, Lin and Chu (2002) panel unit root test for the equation residuals. The optimum lag lengths for the tests are chosen by the AIC. The values in brackets [.] are the p-values for the corresponding null hypothesis. The unit root test equation contains a constant and trend terms.

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[15] The panel unit root test results of Levin et al., (2002) imply that the equation residuals are stationary. Therefore, the equations in Table 4.10 may be interpreted as representing a long-run equilibrium relationships i.e. cointegration.

All the variables in Table 4.10 are statistically significant with expected signs. Higher *de facto* financial openness tends to lead to higher growth in emerging market and developing economies (EMDE). The coefficients of the variables of our basic equation 4.6, remains essentially the same with the inclusion of the financial openness variable. All the results presented in this part of the study suggest that the additional structural domestic variables are all individually significant and do not alter the results for our benchmark equation 4.6.

4.5.1.4   The General Model

We now proceed with the estimation of our benchmark model (Eq. 4.3) augmented with all the other structural domestic conditions variables (rule of law, trade openness and financial openness). To this end, we start with the estimation of the following general model[16]:

$$y_{it} = \alpha_0 + \alpha_1 HC_{it} + \alpha_2 CIF_{it} + \alpha_3 VIX_t + \alpha_4 FD_{it} + \alpha_5 ROL_{it} + \alpha_6 TRADE_{it} + \alpha_7 KAOPEN_{it} + e_{it}$$

$$(4.10)$$

The estimation results of Eq. (4.10) is reported in Table 4.11[17]. We find that the impacts of capital flows and their main components are expansionary. Also, we find that the impacts of better institutional environment, higher level of trade and financial openness are expansionary. The coefficients of all the explanatory variables tend to be virtually the same with those presented earlier. This may be surprising result as these structural domestic condition variables may be expected to be highly collinear and thus their jointly inclusion is expected to change both the coefficient estimates and their standard errors. Our results presented so far strongly suggest that, this indeed is not the case. The correlation matrix of structural domestic condition variables presented by Table 4.12 provides an explanation for

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[16] We also estimate equations (4.3) and (4.4) adding also the structural domestic condition variables (i.e. rule of law, trade openness and financial openness) by employing the panel least squares and panel fixed effects procedures. Our results are presented by Tables C.1 and C.2, in the appendix. Most of these variables are found to be either statistically insignificant or theory inconsistent. As already discussed in this thesis, these procedures may lead to misleading results as they ignore the potential endogeneity of explanatory variables along with their integration and cointegration properties. Considering the unit root tests presented by Table 4.6, growth rate (the dependent variable) is stationary whilst all the explanatory variables are integrated of order one (I(1)). As also convincingly argued by Pedroni (2007), such an unbalance in growth equations, may lead to results from the conventional methods to be unreliable.

[17] The panel unit root test results of Levin et al., (2002) imply that the equation residuals are stationary. Therefore, the equations in Table 4.11 may be interpreted as representing a long-run equilibrium relationships i.e. cointegration.

this. Their correlations are not high and thus, the results of the equations are robust to their inclusion individually and jointly.

Table 4.11: Structural Domestic Conditions, Capital Inflows and Growth: FM-OLS Results for the General Model

	Dependent Variable: y_{it}^{ppp}			
Equations:	(4.10.1)	(4.10.2)	(4.10.3)	(4.10.4)
HC_{it}	0.856*** (0.013)	0.890*** (0.011)	0.895*** (0.010)	0.868** (0.011)
Portfolio_Inflows$_{it}$	0.148*** (0.051)			
FDI_Inflows$_{it}$		0.302*** (0.033)		
Other_Inv._Inflows$_{it}$			0.358*** (0.022)	
Capital_Inflows$_{it}$				0.243*** (0.017)
VIX_t	-0.030*** (0.004)	-0.019*** (0.004)	-0.020*** (0.004)	-0.015*** (0.004)
FD_{it}	0.782*** (0.025)	0.796*** (0.025)	0.770*** (0.023)	0.730*** (0.022)
ROL_{it}	0.201*** (0.007)	0.148*** (0.007)	0.156*** (0.006)	0.199*** (0.007)
$TRADE_{it}$	0.063*** (0.007)	0.068*** (0.006)	0.068*** (0.006)	0.071*** (0.006)
$KAOPEN_{it}$	0.009*** (0.002)	0.012*** (0.001)	0.012*** (0.001)	0.010*** (0.001)
R-square	0.985	0.988	0.988	0.984
LRV	0.001	0.001	0.001	0.001
N	35	45	45	39
NT	591	804	798	644
LLC	-6.763[0.00]	-6.961[0.00]	-6.709[0.00]	-6.307[0.00]

Notes: LRV denotes long-run variance. The values in parentheses are the standard errors. *, ** and *** denote the significance at the 10, 5 and 1 percent, respectively. N and NT are, correspondingly, the numbers of countries and observations for the sample. LLC is the Levin, Lin and Chu (2002) panel unit root test for the equation residuals. The optimum lag lengths for the tests are chosen by the AIC. The values in brackets [.] are the p-values for the corresponding null hypothesis. The unit root test equation contains a constant and trend terms.

Table 4.12: Correlation Matrix of Structural Domestic Conditions

	FD	HC	TRADE	KAOPEN	ROL
FD	1.00				
HC	0.52	1.00			
TRADE	0.14	0.40	1.00		
KAOPEN	0.15	0.43	0.19	1.00	
ROL	0.55	0.52	0.31	0.38	1.00

Notes: All the correlations are statistically significant. Their t-values are not reported to save the space but available upon the request.

4.6 The Growth Consequences of Capital Inflows: Co-Integration and Equilibrium Correction Mechanisms

In the previous section, we present empirical results about the long-run growth enhancing impacts of capital inflows and structural domestic conditions. As stated by the Granger representation theorem, cointegration implies error/equilibrium correction mechanisms (ecm) and ecm implies cointegration. Therefore, the cointegration results of the previous section, as suggested by the stationarity of the equation residuals, implies cointegration and thus ecm. Given that there are cointegrating relationships as already presented by previous section, this part of the study attempts to estimate the dynamics of equilibrium correction mechanisms. To this end, we then continue with the estimation of the following reparametrized version of panel autoregressive distributed lag (PARDL) model (Pesaran et al., 1999; Pesaran et al., 2001);

$$\Delta y_{it}^{ppp} = \alpha_0 + \theta ec_{i,t-1} + \alpha_1 \Delta HC_{it} + \alpha_2 \Delta CIF_{it} + \alpha_3 \Delta FD_{it} + \alpha_4 \Delta ROL_{it} + \alpha_5 \Delta TRADE_{it} +$$
$$\alpha_6 \Delta KAOPEN_{it} + \alpha_7 \Delta y_{i,t-1}^{ppp} + \alpha_8 \Delta HC_{i,t-1} + \alpha_9 \Delta CIF_{i,t-1} + \alpha_{10} \Delta VIX_{t-1} +$$
$$\alpha_{11} \Delta FD_{i,t-1} + \alpha_{12} \Delta ROL_{i,t-1} + \alpha_{13} \Delta TRADE_{i,t-1} + \alpha_{14} \Delta KAOPEN_{i,t-1} + u_{it}$$

$$(4.11)$$

where Δ is the first difference operator and *ec* (error/equilibrium correction term) are the stationary residuals from the estimation of Eq. (4.10) with θ denotes the speed of adjustment. The lag length of Eq. (4.11) is determined according to the modified Bayesian

Information Criteria (MBIC) developed by Han, Phillips and Sul (2017)[18]. After determining the maximum lag length of the model, we employ general to specific approach to obtain the parsimonious panel fixed effects model for measuring the impacts of capital flows and their main components on growth. We prefer to employ the PARDL model because it allows to investigate the long-run relationships along with the short-run dynamics between the variables of interest when it is not known with certainty whether variables of interest are stationary (I(0)), non-stationary (I(1)) or interrelatedly (Pesaran et al., 1999; Pesaran et al., 2001). The PARDL model is valid regardless of whether the explanatory variables are exogenous or endogenous (Chudik et al., 2013) and hence considers the potential endogeneity of the variables that could be important in explaining the determinants of economic growth.

Table 4.13 presents our PARDL estimation results. In all the equations of Table 4.13, error/equilibrium correction (ec) terms are the stationary deviations from the long-run equilibrium relationship in the corresponding equations presented by the earlier section. The ec term, for instance in Eq. 4.11.1 in Table 4.13 are the stationary residuals from the estimation of Eq. 4.10.1 in Table 4.11 which considers the impact of portfolio inflows along with the structural domestic conditions. Similarly, in equations 4.11.2, 4.11.3 and 4.11.4, the ec terms are the stationary residuals from the estimation of 4.10.2, 4.10.3 and 4.10.4, which consider, respectively, FDI, other investment and aggregate capital inflows along with the variables representing structural domestic conditions.

In all the equations in Table 4.13, the ec terms are negative and statistically significant suggesting that real GDP per capita in purchasing power parity adjusts to the deviations from the long-run equilibrium. The results strongly suggest that the capital flows and main components are expansionary in the short-run, except portfolio equity inflows. This supports the crucial importance of FDI and other investment inflows on the evolution of growth for EMDEs even in the short-run. Our results provide a support that the findings of Blanchard et al., (2017) suggesting that the impacts of non-bond flows are expansionary hold only in the short-run, whilst all types of capital flows are expansionary in the long-run. We find that the global financial conditions proxied by VIX is one of the most important determinants of

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[18] Han et al., (2017) report that traditional Bayesian Information Criteria (BIC) is inconsistent and overestimates the true lag length. Hence, the authors modify the conventional BIC in such a way that considering the degrees of freedom adjustment as a penalty term instead of just taking into account the number of observation.

Table 4.13: PARDL Estimation and ECM Results

Dependent Variable: Δy_{it}^{ppp}				
Equations:	(4.11.1)	(4.11.2)	(4.11.3)	(4.11.4)
Constant	0.022***	0.017***	0.018***	0.022***
	(0.004)	(0.003)	(0.003)	(0.004)
$ec_{i,t-1}$	-0.153***	-0.126***	-0.114***	-0.125***
	(0.019)	(0.016)	(0.015)	(0.018)
$\Delta Portfolio\_Inflows_{i,t}$	-0.034			
	(0.047)			
$\Delta FDI\_Inflows_{it}$		0.001**		
		(0.000)		
$\Delta Other\_Inv.\_Inflows_{i,t}$			0.002***	
			(0.000)	
$\Delta Capital\_Inflows_{i,t}$				0.001***
				(0.000)
ΔVIX_t	-0.013*	-0.014**	-0.014**	-0.010*
	(0.007)	(0.005)	(0.005)	(0.006)
$\Delta FD_{i,t}$	0.176***	0.205***	0.200***	0.127**
	(0.055)	(0.049)	(0.048)	(0.052)
$\Delta ROL_{i,t}$	0.079***	0.058***	0.054***	0.064***
	(0.020)	(0.016)	(0.015)	(0.018)
$\Delta TRADE_{i,t}$	0.014	0.012*	0.007	0.013*
	(0.009)	(0.007)	(0.007)	(0.008)
$\Delta KAOPEN_{i,t}$	0.014***	0.011***	0.011***	0.011***
	(0.004)	(0.003)	(0.003)	(0.003)
$\Delta HC_{i,t}$	-0.223	-0.068	-0.055	-0.145
	(0.151)	(0.125)	(0.121)	(0.134)
$\Delta Other\_Inv.\_Inflows_{i,t-1}$			0.001***	
			(0.000)	
$\Delta Capital\_Inflows_{i,t-1}$				0.001***
				(0.000)
$\Delta FD_{i,t-1}$	0.332***	0.307***	0.274***	0.301***
	(0.054)	(0.048)	(0.047)	(0.050)
$\Delta TRADE_{i,t-1}$	0.016*	0.014*	0.011	0.012
	(0.009)	(0.007)	(0.007)	(0.008)
$\Delta y_{i,t-1}^{ppp}$	0.209***	0.233***	0.202***	0.186***
	(0.040)	(0.034)	(0.035)	(0.038)

growth for EMDEs also in the short-run. This result provides a support for the crucial importance of external factors on the evolution of growth dynamics (Calvo et al., 1993; Kose et

Table 4.13: (cont'd)

Equations:	(4.11.1)	(4.11.2)	(4.11.3)	(4.11.4)
Statistics	N=35 NT=556 R^2=0.343 F=5.920[0.00]	N=45 NT=758 R^2=0.315 F=5.879[0.00]	N=45 NT=752 R^2=0.361 F=7.001[0.000]	N=39 NT=604 R^2=0.376 F=6.676[0.00]
MBIC(3)	-3.489	-3.858	-3.904	-3.697
MBIC(2)	-4.589	-4.830	-4.895	-4.753
MBIC	-5.050	-5.280	-5.214	-5.081

Notes: The values in parantheses are the standard errors. *, ** and *** denote the significance at the 10, 5 and 1 percent, respectively. F is the F statistic to the null hypothesis at the slope coefficients are jointly zero and [.] reports the p-value of the F. N and NT are, correspondingly, the number of countries and observations for the sample. MBIC (3) and (2) are the modified BIC for the PARDL lag length respectively for 3 and 2. MBIC is the modified BIC for the estimated equation.

al., 2012; Kose et al., 2013; Erdem & Özmen 2015). The results in Table 4.13 suggest that better global financial conditions and greater risk appetite in international financial markets as represented by a decrease in VIX leads to an increase in real income in EMDEs. Consistent with the conclusion of King and Levine (1993) and Levine (2005), we find that financial development is one of the most important drivers of economic growth. Structural domestic conditions that consist of better institutional environment, higher trade and *de jure* financial openness are associated with stronger growth episodes.

4.7 Main Findings and Concluding Notes

International capital flows have often been found amongst the main determinants of growth and business cycles in emerging market (EME) and developing (DE) economies (EMDE). The substantial increase in capital flows and international financial integration during the recent decades has been led the consequences of capital flows to be increasingly much more topical in international macroeconomics.

The international macroeconomics literature often provides mixed results for the impacts of capital inflows on growth. Capital inflows may be expected to be contractionary as leading to currency appreciation and lower net export. Capital inflows, on the other hand, may be expected to be expansionary by reducing the finance constraint in emerging market and developing economies. This chapter investigated whether capital flows are expansionary

or contractionary in EMDE. The literature survey part of this chapter contained also a critical discussion of the most commonly used growth equations and estimation procedures in the literature.

To investigate the impacts of capital inflows and their main components, we first considered a benchmark growth equation augmented with VIX to represent global financial conditions, human capital, financial development and initial income. The results from panel least squares and panel fixed effects procedures, presented by Chapter 4.3, suggested the aggregate capital inflows and their main components, except portfolio inflows, are expansionary. Our results are mainly consistent with the recent literature and suggest that the effects of FDI and other investment inflows are expansionary. Growth is explained also by human capital, financial development and global financial conditions. The potential endogeneity problem is tackled by the estimation of the benchmark equation by using two-step system GMM estimation procedures in Chapter 4.4. The GMM results are found to be essentially the same with those presented by our earlier findings except for portfolio inflows. According to the GMM results, portfolio inflows are also highly significant in explaining growth in EMDE.

Section 4.5 considers the integration and co-integration properties of variables and employs fully-modified OLS procedure to estimate the long-run impacts of capital inflows on growth. This section also presents our empirical results for our benchmark equation augmented also by structural domestic variables including rule of law, trade openness and financial openness. Our results strongly suggest that all these variables are co-integrated and capital inflows and their main components are expansionary in the long-run. The presence of co-integration implies the presence of an equilibrium/error correction mechanism, and vice versa. Section 4.6 estimates equilibrium correction mechanisms for our general model employing PARDL procedure. Our results strongly suggest that GDP growth adjusts to deviations from the long-run equilibrium relationships. We also find that all capital inflow types except portfolio equity inflows are expansionary in the short-run. The impacts of global financial conditions and structural domestic factors tend to be positive and significant also in the short-run.

Considering the other determinants of economic growth, we find that financial openness, financial development, global financial conditions, trade openness and rule of law are

also important drivers of economic growth. We can interpret the findings in this chapter such that the countries that are more financially open, developed financial systems and well-developed property rights experience stronger growth episodes.

CHAPTER 5

CONCLUSION

International capital flows have often been considered as amongst the main determinants of growth and business cycles along with crises, boom and bust episodes especially in emerging market and developing economies (EMDE). In this thesis, we investigate the main causes and consequences of capital flows focusing on the EMDE sample.

The evidence provided by Chapter 2 shows that international capital flows and consequently international financial integration have been substantially increased during the recent decades. This may partly be explained by the attempts of many EMDE removing or reducing capital account controls. The great moderation period of the post 1990s (Bernanke, 2004) and the ample global liquidity episodes of 2000s until the recent global financial crisis (GFC) are also amongst to plausible explanations of this phenomena. Consequently, gross capital flows, as a percent of world GDP have increased from 5% in the second half of the 1990s to 20% in 2007 and gross external liabilities raised from 60% to the 180% (Guichard, 2017). We observe that, international financial integration measured as the sum of gross financial assets and liabilities (as a % of GDP in current US dollars) tends to increase in all country groupings, albeit the growth of IFI is relatively lower in the post global financial crisis (GFC) period. The IFI has doubled (from around 100% to 220%, our calculations) in the whole sample of countries (excluding financial centers) from 1990 to 2015. This increase tends to be striking in financial centers (from 400% to 2500%) and advanced economies (100% to 450%). Emerging market and developing economies (EMDE) have also experienced substantial increases (from around 80% to 160%) in international financial integration during this period. We find that mean capital flows increases during the pre-GFC period and decreases in the post-GFC period. As compared to EMDE, the change in mean capital flows are substantially higher in advanced economies (AE). This finding is consistent with the evidence of global ample

liquidity in the early 2000s until the GFC whilst there is a global retrenchment during the post-GFC period. The retrenchment in capital flows is the case especially for the advanced country sample, and in other investment flows component of capital flows. Aggregate capital flows tend to increase before the GFC in AE. The increase in capital inflows during the 1990-2007 period is relatively modest in EMDE. Thanks to the unconventional monetary and quantitative easing policies in AE, capital inflows to the EMDE almost remains the same after the GFC. Compared to the 2000-2007 period of ample global liquidity, FDI inflows and outflows decreases sizeable after the GFC in AE. We do not observe a considerable change in FDI inflows and outflows in EMDE after the GFC. The evolution of portfolio equity and other investment flows tends to exhibit similar dynamics with FDI flows both in the AE and EMDE. On the other hand, we find that the volatility of capital inflows is higher than outflows in advanced economies whilst the volatility of outflows is higher than inflows in EMDE. In all country groupings, supporting the findings of Eichengreen et al., (2018), FDI flows are found to be more stable compared to other components of capital flows. In this chapter, we provide some evidence that Lucas paradox i.e. uphill flow of capital does not appear to hold for FDI flows. Finally, this chapter also considers a recent important empirical puzzle that capital inflows and outflows move together. This is a puzzle since under perfect financial markets with no asymmetric information, portfolio choices of residents and non-residents may not systematically diverge from each other. Consequently, the correlation between capital inflows and outflows may be expected not to be positive. Consistent with the recent literature including Broner et al., (2013) and Özmen and Taşdemir (2019), we find that this appears not to be the case. That is, capital inflows and outflows are tend to be highly positively correlated.

In Chapter 3, we investigated the main determinants of capital inflows in emerging market economies (EME). To this end, we maintain that the main pull factor is proxied by domestic growth (GROWTH) whilst the global financial conditions represented by VIX as the main push factor. We also consider structural domestic conditions consisting of institutional quality represented by freedom index of Freedom House, financial depth and trade openness are important drivers of capital inflows and their main components in EME. Considering the potential endogeneity of the main pull factor (GROWTH) and the other domestic structural variables, we estimate the equations by employing two step system generalized method of moments (GMM) procedure. We find that better global financial conditions lead to an increase

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in all types of capital inflows. During the episodes of global financial turbulence capital inflows significantly decrease. The main pull factor is positive and significant for all types of capital inflows except portfolio equity inflows. The positive impact of GROWTH on capital inflows suggests that all the capital flow types are pro-cyclical. Consequently, capital inflows increase and amplify domestic growth in EME during episodes of higher growth. However, during downturns of growth, capital inflows tend to decrease and lead to recessions to be much deeper. This is, indeed, consistent with the findings of Kaminsky et al., (2004) suggesting that most economies experience the episodes of capital inflows in good times and capital outflows in bad times. Also, Kaminsky et al., (2004) find that macroeconomic policies are expansionary in the episodes of capital inflows whilst contractionary in the episodes of capital outflows. Therefore, the reinforcement of capital flow and macroeconomic cycle leads to the "when it rains, it pours" symptom. Also, the impact of freedom is found to be one of the most important determinants of aggregate capital and portfolio equity inflows and the effect of financial depth is one of the significant drivers of FDI inflows. At this point, the GMM results provide also a support for the findings of Eichengreen et al., (2018) suggesting that portfolio equity inflows are explained mainly by push factor, FDI flows are driven mainly by pull factor and other investment inflows are determined by both pull and push factors.

The literature is yet to investigate whether the impacts of main pull and push factors vary with the prevailing *de facto* exchange rate regime (ERR). In Chapter 3.3, we investigate whether the impacts of the main pull and push factors are invariant to the prevailing *de facto* exchange rate regimes. For this, we consider integration and co-integration properties of the variables and estimate our equations by employing fully-modified OLS (FM-OLS) procedure. Our results strongly suggest that ERR do indeed matter for the long-run impacts of the main pull and push factors. We find that better global financial conditions (a decrease in VIX) results with higher capital inflows in the long-run. The impact of this push factor, however, often differs across the prevailing ERR. For aggregate capital and other investment inflows, VIX is negative and significant only under floating ERR. The impact of GFC is substantially high under more flexible ERRs for all capital inflow types except FDI. FDI inflows are basically determined by GROWTH across all ERRs. Portfolio inflows are mainly determined by GFC. The main pull factor (real GDP) is positive and statistically significant in explaining the aggregate capital and FDI inflows. This indicates that an increase in real GDP attracts

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more aggregate capital and FDI inflows. On the other hand, the impact of the pull factor also differs across the prevailing ERR. The pull factor is statistically significant only in floating ERRs, except portfolio equity. The impact of the domestic pull factor on all capital inflow types, except portfolio equity, tends to be much higher under more flexible ERRs. GFC are not significant in determining the evolution of aggregate and other investment inflows under rigid ERRs.

According to the conventional wisdom, credible managed ERRs encourage capital inflows by allowing countries to import monetary policy credibility of the center country, reduces uncertainty and to provide exchange rate guarantee (Calvo et al., 1996). Consequently, greater exchange rate flexibility may discourage cross-border flows. An adverse global financial shock may be expected to lead to domestic currency depreciation and thus to increase exchange rate risk in EME with floating ERRs. All these may discourage foreign residents to buy domestic assets (capital inflows) of these countries. Consistent with this interpretation, Ghosh et al., (2014) find that countries with less flexible ERRs are more likely to experience capital inflow surges.

Chapter 3.3.2 investigates whether prevailing ERR provide endogenous thresholds for the impacts of basic pull and push factors on capital flows in EME by employing Hansen (1999) procedure. In this chapter, we first maintain that the change in the push factor (GFC, proxied by Δvix) as the thresholding variable that specifies the impact of the main push factor may change across the prevailing de facto ERRs. Our results suggest that, the pull factor (GROWTH) is positive and significant in explaining all capital inflow types except portfolio inflows. For all capital inflow types except FDI, "managed floating" regimes are estimated as the endogenous threshold. For FDI inflows, the threshold appears to be the "limited flexibility" regime. Our results suggest that, the push factor is not significantly negative for all capital inflow types in the more rigid ERR. The exchange rate stability appears to be effective in preventing a decrease in capital inflows in countries with more rigid ERR. Worsening global financial conditions, on the other hand, leads to a decrease in aggregate, portfolio and other investment inflows in EME implementing more flexible ERR. This is consistent with an interpretation that worsening GFC leads to capital move from EME to the other EME with more rigid ERR or to AE, respectively, due to exchange rate guarantee or flight to safety concerns.

We also consider the alternative case that the impact of the pull factor (GROWTH) changes across the ERR. We find that the ERR appear not to provide a significant threshold for the impact of domestic growth on FDI and portfolio inflows. For aggregate capital and other investment inflows, on the other hand, mainly pegged ERR are found to be endogeneous thresholds. The impact of domestic economic conditions, proxied by GROWTH, appears to be substantially much higher on aggregate capital and other investment inflows under pegged ERRs than more flexible ERR arrangements. The changes in GFC, proxied by Δvix, on the other hand, is negative and significant only for portfolio inflows.

Our results suggest that, the push factor (VIX) is not significantly negative for all capital inflow types in more rigid ERR. The exchange rate stability appears to be effective in preventing a decrease in capital inflows in these ERR. Worsening global financial conditions, on the other hand, leads to a decrease in aggregate, portfolio and other investment inflows in EME implementing more flexible ERR. This is consistent with an interpretation that worsening GFC leads to capital move from EME to the other EME with more rigid ERR or to AE, respectively, due to exchange rate guarantee or flight to safety concerns. The impact of domestic economic conditions, proxied by GROWTH, appears to be substantially much higher on aggregate capital and other investment inflows under pegged ERR than more flexible ERR arrangements. GFC, on the other hand, is negative and significant only for portfolio inflows. This result, is indeed consistent with the earlier results suggesting that ERR provide thresholds for the impact of GFC. Consequently, ignoring these thresholds may lead to misleading results.

The main findings in Chapter 3 suggest that endogenously estimated ERR thresholds do matter especially for the impact of GFC. The impact of GFC is substantially high under more flexible ERR for all capital inflow types except FDI. FDI inflows are basically determined by the pull factor across all ERR. Portfolio inflows are mainly determined by GFC. The sensitivity of aggregate and other investment inflows to the pull factor seems to be much higher under more rigid ERR. Our results are broadly in line with the literature suggesting that credible managed ERR encourage capital inflows by allowing countries to import monetary policy credibility of the center country and to provide exchange rate guarantee. Our results also support the Passari and Rey (2015) postulation that the insulation properties of floating ERR may have been over-estimated. To conclude, exchange rate regime flexibility,

albeit potentially providing a buffer against external shocks by allowing more monetary policy independence, also contains uncertainty and exchange rate risk discouraging capital inflows during the episodes of global financial turbulence.

The main motivation of Chapter 4 is actually provided by Blanchard et al., (2017) noting that there is a contradiction between the theoretical postulation of the conventional literature following the Mundell-Fleming framework and the policy considerations of capital inflows and growth. The theory postulates that higher capital inflows lead to domestic currency appreciation and thus, leads to decrease in international competitiveness and hence lower economic growth. The policy makers of EMDE, however, enjoys higher capital inflows as they enhance higher foreign finance to domestic investments through higher credit availability. The results of Chapter 4 basically strongly suggest that capital inflows and their main components are expansionary in terms of growth.

To conclude, our thesis provides some important contributions for the causes and consequences of international capital inflows. The increase in international capital flows and thus international financial integration appears to be a stylized fact for different country groupings such as financial centers, advanced (AE), emerging market (EME) and developing (EMDE) economies. The dynamics of capital inflows, however, tend to be different after the recent global financial crisis (GFC). After the GFC, capital flows in AE tend to decrease, and thanks to the unconventional monetary policies including quantitaive eassing and zero lower bound on interest rates, capital inflows to EMDE do not exhibit a decreasing trend. We also find that, the main pull (GROWTH) and push (VIX, international financial conditions) are amongst to basic determinants of capital inflows and their main components. Our results also show that domestic structural variables such as, institutional quality, trade openness and financial depth, are also amongst the important drivers of capital inflows. This appears to be robust to alternative estimation procedures and models. Another important contribution of this thesis is provided by the empirical evidence that exchange rate regimes matter, and, indeed provide endogenous thresholds for the impacts of the main pull and push factors. Chapter 4 provides an empirical contribution to the *schizophrenia* interpretation of Blanchard et al., (2017) about the impacts of capital inflows. According to Blanchard et al., (2017), the theoretical conventional Mundell-Fleming framework postulates that the impacts of capital flows are contractionary whilst policy makers perceive that capital inflows enhance growth via re-

ducing foreign finance constraints and allowing higher credit growth. Our results, robust to the different estimation procedures and models convincingly suggest that capital inflows are expansionary even in the long-run. The results overall suggest that, in the context of capital inflows and growth *"when it rains it pours"* as argued by Kaminsky et al., (2004), that is capital inflows magnify growth in good times but dampens in bad times leading to magnify the amplitude of boom and bust business cycles.

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APPENDICES

APPENDIX A

DATA SOURCES AND COUNTRY LIST AND THEIR CLASSIFICATIONS

This study considers annual data for the whole variables.

Table A.1: Data Sources

Variable	Source
Capital Inflows	IMF, Balance of Payments and International Investment Position Statistics
VIX	Cboe Options Exchange, Historical Data
Real GDP per capita	World Bank, World Development Indicators
Real GDP per capita purchasing power parity	World Bank, World Development Indicators
Trade Openness (% of GDP)	World Bank, World Development Indicators
Rule of Law	World Bank, Worldwide Governance Indicators
Financial Development	IMF, Financial Development Database
Freedom	Freedom House, Country Status Distribution
Financial Depth	World Bank, World Development Indicators
Human Capital	Penn World Table, version 9
Financial Openness	The Chinn-Ito Index

Table A.2: Balance of Payments

	Credit	Debit	Balance
Current Account			
Goods and Services			
Goods			
Services			
Balance on goods and services			
Primary Income			
Compensation of employees			
Interest			
Distributed income of corporations			
Reinvested earnings			
Rent			
Secondary Income			
Current taxes on income, wealth, etc.			
Net nonlife insurance premiums			
Nonlife insurance claims			
Current international cooperation			
Miscellaneous current transfers			
Adjustment for change in pension entitlements			
Balances on current account			
Capital Account			
Acquisitions/disposables of non-produced nonfinancial assets			
Capital transfers			
Capital account balance			
Balances on current and capital account			
Financial Account			
Direct Investment			
Portfolio Investment			
Financial derivative and employee stock options			
Other investment			
Reserve assets			
Net lending (+)/ net borrowing (-)			
Net errors and omissions			

Source: International Monetary Fund (IMF), 2009.

Table A.3: Country List

Financial Centers	Non-Financial Centers				
	Advanced Economies	Emerging Market Economies		Developing Economies	
Belgium	Australia	Argentina	Jordan	Belarus	Moldova
Ireland	Austria	Bangladesh	Kazakhstan	Bolivia	Mongolia
Netherlands	Canada	Bosnia and H.	Kenya	Burkina Faso	Niger
Singapore	Denmark	Botswana	Korea R.	Costa Rica	Palau
Switzerland	Finland	Brazil	Lithuania	Cote d'Ivoire	Senegal
United Kingdom	France	Bulgaria	Malaysia	Djibouti	Swaziland
Mauritius	Germany	Chile	Mexico	Dominican R.	Togo
	Greece	Colombia	Morocco	Ecuador	Ukraine
	Italy	Croatia	Nigeria	El Salvador	Uruguay
	Japan	Czech R.	Pakistan	Fiji	Venezuela
	New Zealand	Egypt	Peru	Georgia	
	Norway	Estonia	Philippines	Guatemala	
	Portugual	Hungary	Poland	Guyana	
	Spain	India	Romania	Haiti	
	Sweden	Indonesia	Russia	Honduras	
	United States	Israel	Serbia R.	Latvia	
		Jamaica	Slovak R.	Macedonia	
		Slovenia	Thailand	Malawi	
		South Africa	Turkey	Mali	
		China			

Source: MSCI Country Classification.

APPENDIX B

PANEL THRESHOLD ESTIMATION PROCEDURE

Panel threshold estimation procedure is based on the assumption that regression functions can differ across the observations (Hansen, 1999). Based on the observed variable, observations can be classified into low and high regimes by depending on the threshold variable q_{it}. The intuition behind this procedure is that the responses of the variables can be asymmetric and hence, nonlinear. Due to the heterogenous nature of panel data, panel threshold estimation procedure considers the homogenization of heterogenous sample.

The main equation of interest is

$$y_{it} = \mu_i + \beta_1' x_{it} I(q_{it} \leq \gamma) + \beta_2' x_{it} I(q_{it} > \gamma) + e_{it} \quad \text{(B.0.1)}$$

where I(.) is the indicator function, γ is the threshold and q_{it} is the threshold variable. By estimating Eq. B.0.1, we split the observations into two regimes: low ($q_{it} \leq \gamma$) and high regime ($q_{it} > \gamma$). Note that slope coefficients are different in low and high regimes.

Panel threshold estimation, first of all, requires the hypothesis testing of linear vs. nonlinear model i.e. whether there is threshold or not. If there is no threshold, it is more appropriate to estimate linear model is estimated. Otherwise, it is required to estimate panel threshold model. The estimation of Equation B.0.1 requires the elimination of individual fixed effect by subtracting individual-specific means from the actual data. Then, the whole variables ordered ascendingly according to the threshold variable. By trimming $\eta\%$ of the de-meaned data from the both sides, sum of squared residuals are calculated for each possible threshold candidate. The minimum sum of squared residual gives us the treshold variable. After finding the threshold variable, panel fixed effect model is estimated for the low and high regimes.

APPENDIX C

CONVENTIONAL ESTIMATION RESULTS: THE IMPACT OF RULE OF LAW, TRADE AND FINANCIAL OPENNESS

Table C.1: The Augmented Conventional Model: Panel Least Squares Estimation Results

Dependent Variable	Δy_{it}	Δy_{it}^{ppp}
Constant	0.116***	0.116***
	(0.014)	(0.015)
$y_{i,1995}$	-0.000**	-0.000*
	(0.000)	(0.000)
Portfolio_Inflows$_{it}$	0.034	0.034
	(0.059)	(0.059)
FDI_Inflows$_{it}$	0.141***	0.142***
	(0.036)	(0.036)
Other_Inv._Inflows$_{it}$	0.175***	0.173***
	(0.027)	(0.027)
VIX_t	-0.034***	-0.034***
	(0.004)	(0.004)
FD_{it}	0.029***	0.028***
	(0.010)	(0.010)
ROL_{it}	-0.001	-0.002
	(0.003)	(0.003)
$TRADE_{it}$	0.006	0.007*
	(0.004)	(0.004)
$KAOPEN_{it}$	-0.001	-0.001
	(0.001)	(0.001)
NT	859	859
N	55	55
R^2	0.162	0.159
F-Statistic [p-value]	0.000	0.000

Notes: ***, ** and * denote significance level at 1 percent, 5 percent and 10 percent. The values in brackets are the standard errors. NT shows the total number of observations; N shows the number of cross section units.

Table C.2: The Augmented Conventional Model: Panel Fixed Effects Estimation Results

Dependent Variable	Δy_{it}	Δy_{it}^{ppp}
Constant	0.128***	0.128***
	(0.016)	(0.016)
$y_{i,t-1}$	0.155***	0.155***
	(0.032)	(0.032)
Portfolio_Inflows$_{it}$	0.019	0.019
	(0.057)	(0.057)
FDI_Inflows$_{it}$	0.114***	0.114***
	(0.040)	(0.040)
Other_Inv._Inflows$_{it}$	0.150***	0.150***
	(0.028)	(0.028)
VIX_t	-0.035***	-0.035***
	(0.004)	(0.004)
FD_{it}	-0.028	-0.028
	(0.022)	(0.022)
ROL_{it}	-0.021***	-0.021***
	(0.008)	(0.008)
$TRADE_{it}$	0.003	0.003
	(0.007)	(0.007)
$KAOPEN_{it}$	0.001	0.001
	(0.002)	(0.002)
NT	854	854
N	55	55
R^2	0.337	0.337
F-Statistic [p-value]	0.000	0.000

Notes: ***, ** and * denote significance level at 1 percent, 5 percent and 10 percent. The values in brackets are the standard errors. NT shows the total number of observations; N shows the number of cross section units.

APPENDIX D

CURRICULUM VITAE

Personal Information

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Education

Ph.D. (2014-2019), Department of Economics, Middle East Technical University, Ankara, Turkey.

M. Sc. (2012-2014), Department of Economics, Middle East Technical University, Ankara, Turkey.

B.Sc. (2006-2010), Department of Economics, Erciyes University, Kayseri, Turkey.

Research Interests

Applied Econometrics, Growth, International Finance, Macroeconomics.

Papers: Under Review

- Özmen, E., and Taşdemir, F. (2018). "Gross capital inflows and outflows:Twins or distant cousins?", METU ERC WP No: 1807, (http://www.erc.metu.edu.tr/menu/series18/1807.pdf).

- Taşdemir, F., and Özmen, E. (2018). "Exchange Rate Regimes as Thresholds: The Main Determinants of Capital Inflows in Emerging Market Economies ", METU ERC WP No: 1810, (hhttp://www.erc.metu.edu.tr/menu/series18/1810.pdf).

- Özmen, E., and Taşdemir, F. (2019). "Globalisation and Governance: Thresholds for the Impacts of the Main Determinants of Capital Inflows?", METU ERC WP No: 1902,

(http://erc.metu.edu.tr/en/system/files/menu/series19/1902.pdf).

Experience

Sinop University, Department of Economics, 2018 - Present, Research Assistant

Middle East Technical University, Department of Economics, 2012 - 2018, Research and Teaching Assistant:

Introduction to Economics I , Introduction to Economics II , Macroeconomic Theory I, Macroeconomic Theory II, Statistics for Economists I, Principles of Economics, Introduction to Econometrics I, Introduction to Econometrics II, Introduction to International Economics II, Econometric Methods II (graduate course), Practical Training in Economics I.

Projects

- Market Design: Fishing Rights, TUBİTAK 3501 Programme, 2015-2017, Researcher.

- Uluslararası Sermaye Hareketleri: Nedenleri ve Sonuçları, ODTÜ BAP Projesi, 2018-2019, Araştırmacı.

Conference Papers

- Structural Change in China (with Şirin Saracoğlu). Presented at the IV. Anadolu International Conference in Economics, Anadolu University, Eskişehir, June 10-12 2015.

- Gross capital inflows and outflows:Twins or distant cousins? (with Erdal Özmen). Presented at the 6th International Conference on Economics, Turkish Economic Association, Antalya, 1-3 November 2018.

Technical Strengths

Computer Languages: R Studio, Stata, EViews, RATS

Software & Tools: LaTeX, Mathematica

Languages

Turkish (Native), English (Fluent).

APPENDIX E

TURKISH SUMMARY / TÜRKÇE ÖZET

Uluslararası sermaye hareketleri, yerli ve yabancı ülke yerleşikleri arasında finansal varlık alım satımına karşılık gelen bir kavramdır. Son yıllarda yapılan çalışmalar, uluslararası sermaye hareketlerinin, iş çevrimlerinin ve ekonomik büyümenin en temel belirleyicilerinden biri olduğunu belirtmektedir. Uluslararası sermaye hareketleri ve finansal bütünleşmede gözlemlenen artış ise uluslararası sermaye hareketlerinin neden ve sonuçlarının araştırılmasını daha önemli hale getirmektedir ve bu tezin ana temasını oluşturmaktadır.

Literatürde yapılan çalışmalara bakıldığında, uluslararası sermaye hareketlerinin "net" ve/veya "brüt" tanımı kullanılarak incelendiği anlaşılmaktadır. "Net" sermaye hareketleri yabancı ülke yerleşiklerinin yerel finansal varlık alım/satımı (brüt sermaye girişi) ile yerel yerleşiklerin yabancı finansal varlık alım/satımı (brüt sermaye çıkışı) arasındaki farka karşılık gelmektedir. "Brüt" sermaye hareketleri ise yerel yerleşiklerin yabancı finansal varlık alım/satımını brüt sermaye çıkışı, yabancı yerleşiklerin yerel finansal varlık alım/satımını ise brüt sermaye girişi olarak tanımlanmasına dayanmaktadır. Ödemeler dengesi bilançosu, sermaye hareketlerine ilişkin temel veri kaynağını oluşturmaktadır ve yerli ve yabancı ülke yerleşikleri arasında gerçekleşen ekonomik işlemleri göstermektedir. Temel veri kaynağı açısından bakıldığında, sermaye hareketlerinin "brüt" tanım kullanılarak yapılması gerekmektedir. Bu bağlamda, brüt sermaye hareketleri yerli ve yabancı yerleşiklerin finansal varlık alım/satımına ilişkin karar mekanizmasının farklı olduğunu öne sürmektedir. Son yıllarda yapılan çalışmalar, sermaye hareketlerinin "brüt" tanım kullanılarak incelenmesi durumunda, sermaye hareketlerinde gözlemlenen değişimin daha gerçekçi sonuçlar doğuracağını açıkça ortaya koymaktadır. Ayrıca, her iki tanımın sermaye hareketlerini incelemeyi amaçlamasına rağmen, farklı kavramlara tekabül eden olguları açıkladığı belirtilmektedir. Örnek olarak, net sermaye hareketleri cari işlemler dengesinin ayna görüntüsüdür. Ancak, brüt sermaye hareketleri için aynı şeyi söylemek mümkün değildir. Net sermaye hareketlerinin nedenlerini açık-

lamak isteyen bir araştırmacı için elde ettiği sonuçların gerçekte sermaye hareketlerindeki değişimi mi yoksa cari işlemler dengesindeki değişimi mi açıkladığı konusunda belirsizlik bulunmaktadır. Tanım olarak, cari işlemler dengesi mal ve hizmet ithalat ve ihracatı arasındaki farkı göstermekte iken net sermaye hareketleri, yerli ve yabancı yerleşiklerin finansal varlık alım/satımı arasındaki farkı göstermektedir. Bu nedenle, sermaye hareketlerinin incelenmesinde brüt tanımın kullanılması finansal varlık alım/satımına ilişkin daha gerçekçi analizlerin yapılmasına yardımcı olacaktır.

Sermaye hareketlerinin incelenmesinde dikkat edilmesi gereken diğer önemli bir konu ise toplam sermaye hareketlerinin birbirinden farklı özelliklere sahip alt bileşenlerden oluşmasıdır. Toplam sermaye hareketleri, kısaca portföy, doğrudan yabancı sermaye yatırımları ve bankalar arası sermaye hareketlerinden oluşmaktadır. Portföy sermaye hareketleri finansal piyasalara doğrudan erişim sağlayan finansal varlıklara ilişkin işlemleri kapsamaktadır ve bu bağlamda, toplam sermaye hareketlerinin diğer bileşenlerine kıyasla likidite ve esneklik özelliği daha fazladır. Doğrudan yabancı sermaye yatırımları ise yabancı firmaların yerel firmalar üzerinde kontrol ve/veya önemli bir etki gücüne sahip olmasını ifade etmektedir. Doğrudan yabancı sermaye hareketleri, portföy ve bankalar arası sermaye hareketlerine kıyasla daha uzun vadeli finansal varlık alım/satımına ilişkin karar içermesinden dolayı daha az esneklik ve likidite özelliği sağlamaktadır. Bankalar arasındaki sermaye hareketleri ise toplam sermaye hareketlerinden portföy ve doğrudan yabancı sermaye yatırımlarının çıkartılması ile bulunmaktadır. Bu hareketler, kredi, Uluslararası Para Fonu (IMF) kredileri, hisse senetleri, ticari krediler, mevduatlar vb. işlemleri kapsamaktadır. Birbirinden farklı özelliklere sahip alt bileşenleri bünyesinde barındırmasından dolayı, toplam sermaye hareketleri kadar alt bileşenlerinin incelenmesi de oldukça önemlidir.

Uluslararası sermaye hareketlerinin incelenmesinde ilk adım biçimlendirilmiş olguların tespit edilmesidir. Sermaye hareketlerine ilişkin biçimlendirilmiş bulguları Broner vd. (2013)'den de faydalanarak kısaca şu şekilde özetlemek mümkündür: (i) Sermaye hareketlerinde gözlemlenen volatilite yıllar içerisinde artmıştır. (ii) Uluslararası sermaye hareketleri, ülkede mevcut olan konjonktür ile aynı yönde hareket etmektedir. Yani, genişleme sürecinde sermaye girişleri artmakta ve daralma sürecinde ise sermaye girişleri azalmaktadır. (iii) Kriz dönemlerinde sermaye girişlerinde azalma gözlemlenmektedir. Bu durum, genel olarak, toplam sermaye girişlerinin alt bileşenleri için de geçerlidir. Biçimlendirilmiş

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olgulara bağlı olarak, literatürde sermaye hareketlerini inceleyen çalışmalar iki ana grupta toplanmıştır. İlk grup, sermaye hareketlerinin nedenlerini incelemektedir. Sermaye hareketlerinin nedenlerini inceleyen ilk çalışmalar çoğunlukla ülkeye özgü çekme faktörlerin önemli olduğunu belirtirken, Calvo vd. (1993;1996) ve Fernandez-Arias (1996) dışsal itme faktörlerin de oldukça önemli olduğunu belirtmiştir. Dolayısıyla, günümüzde sermaye hareketlerinin nedenleri hem itme hem de çekme faktörleri ile ilişkilendirilmektedir. İtme faktörleri, gelişmiş ülkelerin makro ekonomik politikalarını ve küresel finansal ve likidite koşullarını kapsamaktadır. Çekme faktörleri ise ülkeye özgü makro ekonomik koşulları ifade etmekte ve kurumsal kalite ve yönetim, döviz kuru rejimi, sermaye hareketleri serbestliği, uluslararası finansal bütünleşme ve ticari açıklık gibi değişkenleri içermektedir. Montiel (2014), Avdjiev vd., (2018), Koepke (2019) ve Eichengreen vd. (2018) uluslararası sermaye hareketlerini itme ve çekme faktörleri bağlamında inceleyen çalışmalar olarak ön plana çıkmaktadır.

İktisat yazınında, sermaye hareketlerini inceleyen ikinci grup çalışmalar ise sermaye hareketlerinin sonuçlarına odaklanmaktadır. Mundell-Fleming modeli, sermaye girişlerinin ulusal paranın diğer para birimlerine karşı değer kazanmasına yol açacağını, dolayısıyla, net ihracatı ve ekonomik büyümeyi azaltacağını önermektedir. Ancak, özellikle yükselen piyasa ekonomileri politika yapıcıları, sermaye girişlerinin kredi genişlemesine yol açtığını ve ekonomik büyümeyi artırdığını belirtmektedir. Blanchard vd. (2017) ise uluslararası sermaye hareketleri konusunda Mundell-Fleming modelin öngörüleri ile gerçek veri arasında nasıl uzlaşı sağlanacağı sorusunu gündeme getirmiştir. Dolayısıyla, sermaye hareketlerinin ekonomik büyümeye etkilerinin analizi güncel bir konu olarak varlığını sürdürmektedir.

Bu bağlamda, tezin temel amacı yükselen piyasa ekonomilerinde, sermaye girişlerinin ve temel bileşenlerinin nedenlerini ve ekonomik büyümeye etkilerinin incelenmesidir. Öncelikle, sermaye hareketlerinin ve temel bileşenlerinin nedenleri, itme ve çekme faktörleri kapsamında son dönem panel veri yöntemleri kullanılarak incelenmiştir. Bu kapsamda, itme ve çekme faktörlerinin yanı sıra, siyasi haklar ve sivil özgürlükler ile gösterilen kurumsal kalite, finansal gelişme ve ticari açıklık gibi yapısal iç koşulların da sermaye hareketlerinin nedenlerini açıklamada önemli faktörler olup olmadığı araştırılmıştır. Ayrıca, sermaye hareketleri ve alt bileşenlerinin belirleyicilerinin döviz kuru rejimine göre farklılık gösterip göstermediği ve döviz kuru rejiminin sermaye girişlerinin belirleyicilerini açıklamada eşik değer oluşturup oluşturmadığı incelenmiştir. Sermaye hareketlerinin nedenleri incelenirken elde edilen

sonuçlar politika yapıcılar için oldukça önemlidir. Eğer sermaye hareketleri, temel olarak dışsal itme faktörleri tarafından açıklanıyor ise, bu durumda politika yapıcıların daha kısıtlı politika alternatifleri olacaktır. Ancak, sermaye hareketleri ülkeye özgü faktörler ve yapısal iç koşullar tarafından açıklanıyor ise, sermaye girişlerine, aktif politikalar ve finansal reformlar ile yön vermek mümkün olacaktır. Sermaye hareketlerinin ekonomik büyümeye etkisi açıklanırken, temel büyüme değişkenlerinin yanı sıra yapısal iç koşullar da göz önünde bulundurulmuştur. Sermaye hareketlerinin kısa ve uzun dönem büyüme etkileri incelenmiştir. Sermaye hareketlerinin, büyüme etkilerinin araştırılması da özellikle politika yapıcılar için oldukça önemlidir. Eğer sermaye hareketleri ve temel bileşenleri veya bunların bazıları kısa ve uzun dönemde ekonomik büyümeye olumlu bir katkı sağlamıyor ise uygulanacak politika ile sermaye hareketlerinin bileşenlerine yön vermek olası bir politika önerisi olarak ön plana çıkmaktadır.

Bu çalışma, sermaye hareketleri literatürüne çeşitli açılardan ampirik katkı sağlamayı hedeflemektedir. Bu hedef doğrultusunda, sermaye hareketlerinin ve temel bileşenlerinin nedenleri itme ve çekme faktörleri kapsamında incelenmektedir. Bu çerçevede, çalışmada önce, literatürde yer alan çalışmalardan farklı olarak, açıklayıcı değişkenler arasındaki olası içsellik sorunu da göz önünde bulundurularak iki aşamalı sistem genel momentler yöntemi (GMM) uygulanarak sermaye hareketlerinin nedenleri incelenmiştir. Sermaye hareketleri ve temel bileşenlerinin belirleyicilerini incelerken, döviz kuru rejiminin önemli bir faktör olup olmadığı da dikkate alınmıştır. Bu amaçla, önce sermaye hareketlerinin belirleyicilerinin yönetimli ve dalgalı döviz kuru rejimlerindeki farklılıklar araştırılmıştır. Bunun sonrasında döviz kuru rejimlerinin, temel itme ve çekme değişkenlerinin etkilerinde içsel eşik oluşturma durumları, panel sabit etki içsel eşik değer tahmin yöntemi (Hansen, 1999) kullanılarak incelenmiştir. Literatürde yer alan çalışmalar, genellikle değişkenlerin bütünleşme ve eş-bütünleşme durumlarını dikkate almamaktadır. Bu bağlamda, değişkenlerin bütünleşme ve eş-bütünleşme özelliklerini de dikkate alan tamamen değiştirilmiş en küçük kareler (FM-OLS) yöntemi uygulanmıştır. Bu yöntem, aynı zamanda içsellik ve eşanlılık, içsel bağıntı ve dağılım farklılığı problemlerini de göz önünde bulundurmaktadır.

Ekonomi yazınında yer alan çalışmalar, genellikle, sermaye hareketlerinin nedenlerini açıklarken, döviz kuru rejiminin ya önemli bir faktör olmadığını ya da sabit döviz kuru rejimlerinde açıklayıcı değişkenlerin etkisinin daha yüksek olduğu sonucunu önermektedir. Ancak,

Rogoff vd., (2004) tarafından belirtildiği gibi, güvenilir ve sürdürülebilir bir sabit döviz kuru rejimi, kur belirsizliğini ve işlem maliyetlerini azaltacaktır. Sabit döviz kuru rejimleri, kurun sabitlendiği ülkenin para politikasını ve düşük enflasyon oranını ithal etmesi sebebiyle de tercih edilmektedir. Tüm bu nedenlerden dolayı, güvenilir ve sürdürülebilir sabit döviz kuru rejimlerinin daha fazla sermaye girişine yol açması beklenmektedir. Bu çalışmada, döviz kuru rejimlerinin, itme ve çekme faktörlerinin uluslararası sermaye girişleri üzerindeki etkilerinde belirleyici olduğu bulunmaktadır.

Bu çalışmanın ikinci kısmında uluslararası sermaye girişleri ve temel alt bileşenlerinin ekonomik büyümeye etkileri de araştırılmaktadır. Sermaye hareketlerinin ekonomik büyümeye etkileri incelenirken, hem panel sabit etki, hem panel en küçük kareler yöntemi hem de iki aşamalı sistem GMM panel veri yöntemleri kullanılmıştır. Çalışma, bu tahmin yöntemlerinin, incelediğimiz modeller için geçerliliklerini de tartışmaktadır. Çalışmada, bunların yanısıra, ekonomik büyümeyi açıklayan değişkenler arasında olası içsellik/eşanlılık, dağılım farklılığı, içsel bağıntı, durağanlık ve eş-bütünleşme unsurlarını da dikkate alan FM-OLS yöntemi de uygulanmıştır. Son olarak, toplam sermaye girişleri ve temel bileşenlerinin kısa ve uzun dönemde ekonomik büyümeye etkileri ile hata düzeltme mekanizmaları, panel içsel bağıntılı dağıtılmış gecikmeler modeli kullanılarak incelenmiştir. Panel içsel bağıntılı dağıtılmış gecikmeler (PARDL) modelinde gecikme katsayısı Han vd. (2017) tarafından önerilen uyarlanmış Bayesian bilgi kriteri (MBIC) kullanılarak belirlenmiştir.

Bu çalışmada, sermaye hareketlerine ilişkin temel veri kaynağı IMF tarafından yıllık olarak yayımlanan ödemeler bilançosu tablolarıdır. Toplam sermaye girişleri, bünyesinde barındırdığı alt kalemlerin farklı özelliklere sahip olmasından dolayı eşit dağılımda değildir. Bu nedenle, toplam sermaye girişleri kadar alt bileşenlerinin incelenmesi de oldukça önemlidir. Koepke (2019)'un belirttiği üzere brüt sermaye girişlerinin brüt sermaye çıkışlarına kıyasla dalgalanması daha yüksektir ve finansal istikrar için daha büyük önem arz etmektedir. Belirtilen nedenlerden dolayı, bu çalışmada yapılan tüm analizlerde brüt sermaye girişleri verisi kullanılmıştır. Rey (2015, 2016), küresel likidite ve belirsizlik endeksi olarak tanımlanan VIX değişkeninin sermaye hareketleri, kredi genişlemeleri ve varlık fiyatları ile ilişkili olması sebebiyle küresel finansal koşulları temsil ettiğini belirtmiştir. Bu çalışmada kullanılan VIX verisi Chicago Opsiyon Borsası Oynaklık Endeksi'nden alınmıştır ve temel olarak küresel likidite/finansal koşulları ve risk iştahını temsil etmektedir. VIX endeksinde bir artış

(azalış) küresel finansal likidite koşullarının kötüleştiğini (iyileştiğini) göstermektedir. Uluslararası ticaret açıklığı (ihracat ve ithalatın milli gelire (GSYİH) oranı), finansal derinlik (özel sektör kredilerinin GSYİH'e oranı), reel Gayri Safi Yurt İçi Hasıla (GSYİH) değişkenlerine ait veriler, Dünya Bankası, Küresel Kalkınma Göstergeleri veri setinden alınmıştır. Kurumsal kaliteyi temsil etmesi için siyasi haklar ve sivil özgürlükler verisi Fraser Enstitüsü tarafından yıllık olarak yayımlanan Freedom House sitesinden temin edilmiştir.

Bu çalışmada öncelikli olarak brüt sermaye hareketleri ve temel bileşenlerinin yıllara ve ülkelerin gelişmişlik düzeylerine göre değişimi incelenmiştir. Tezin 2. bölümünde Lane ve Milesi-Ferretti (2003, 2018) tarafından önerilen uluslararası finansal bütünleşme (finansal varlık ve yükümlülükler toplamının GSYİH'ye oranı) tanımı kullanılarak, gelişmiş, yükselen piyasa ve gelişmekte olan ülke ekonomilerinde finansal bütünleşme düzeylerinin arttığı gösterilmektedir. Uluslararası finansal bütünleşme, ülkeler arasında finansal varlık alım-satımına ilişkin bir gösterge olmakla beraber aynı zamanda ülkelerin finansal derinleşme düzeylerine ilişkin de bilgi sağlamaktadır. Bu bağlamda, gelişmiş ülkelerde finansal derinleşme düzeyi 1990 yılına kıyasla son dönemde yaklaşık üç kat kadar artmıştır. Yükselen piyasa ve gelişmekte olan ülke ekonomilerinde ise yaklaşık iki kat artış söz konusudur. Sermaye hareketlerinin zaman içerisinde gelişiminin betimsel istatistikler aracılığıyla incelenmesinden elde edilen biçimlendirilmiş bulgulardan ilki sermaye hareketlerinin küresel kriz öncesi ve sonrası dönemler için farklı olmasıdır. 2000-2007 döneminde, gelişmiş ülke ekonomilerinde gözlemlenen sermaye hareketleri diğer ülke gruplarına göre daha fazladır. Ancak, 2008-2015 döneminde, gelişmiş ülke ekonomilerinde sermaye hareketlerinde ciddi bir daralma gözlemlenirken, bu durum yükselen piyasa ve gelişmekte olan ülke ekonomilerinde daha ılımlı bir daralma şeklinde gerçekleşmiştir. 2008 küresel finansal kriz sonrasında gelişmekte olan ve yükselen piyasa ekonomilerindeki bu gelişmeler, ABD ve diğer gelişmiş ülkelerdeki faiz oranlarındaki sıfır alt sınır vb. adımları da içeren geleneksel olmayan para politikaları ile açıklanabilir. Bu politikalar sonucunda gelişmekte olan ve yükselen piyasa ekonomilerinde yüksek miktarda sermaye girişleri gerçekleşmiş ve bunun sonucunda yüksek büyüme oranları gözlemlenmiştir.

İkinci biçimlendirilmiş bulgu ise, 1990-2007 döneminde sermaye hareketlerinin ve temel alt bileşenlerinin volatilitesi yükselen piyasa ve gelişmekte olan ülke ekonomilerinde daha fazla iken, 2008 küresel finansal kriz sonrası döneminde (2008-2015), bu volatilitenin

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gelişmiş ülkelerde daha fazla olduğu gözlemlenmektedir. Yani bu durum küresel kriz öncesi dönemindeki olumlu küresel finansal koşulların ve likidite bolluğundan en çok gelişmiş ülkelerin faydalanması değerlendirmesi ile tutarlıdır. Ancak, küresel kriz sonrası dönemde gelişmiş ülkelerde toparlanmanın çok yavaş, gelişmekte olan ve yükselen piyasa ekonomilerinde ise çok hızlı ve yüksek olduğu bilinmektedir. Bu durum sermaye hareketlerinin, küresel finansal kriz sonrasında, farklı ülke gruplarında farklı davranışlar sergilemesi gözlemi ile tutarlıdır.

Üçüncü biçimlendirilmiş bulgu, Broner vd. (2013), Davis ve van Wincoop (2018), Özmen ve Taşdemir (2018) tarafından da belirtildiği gibi, brüt sermaye giriş ve çıkışları arasında pozitif yönlü bir ilişki olduğu belirtilmektedir. Ancak, Blanchard ve Acalin (2016) tarafından da önemle belirtildiği gibi, eğer bir ulusal finansal varlık, yabancı yerleşikler için getirisi daha yüksek olması sebebiyle daha çekici ise, bu durumda yerel yerleşiklerin yurtdışından yabancı finansal varlık satın almaması yani sermaye giriş ve çıkışları arasında korelasyon olmaması gerekmektedir. İlgili ekonomi yazınında yer alan son dönem çalışmalar (Milesi-Ferretti & Tille 2011; Broner vd., 2010; Tille & van Wincoop, 2010; Davis & van Wincoop 2018), sermaye giriş ve çıkışı arasındaki pozitif yönlü ilişkiyi bilgi asimetrisi, döviz kuru riski, finansal çalkantı durumunda finansal varlıklara ilişkin mülkiyet hakkı sorunsalı ve yüksek finansal bütünleşme ile açıklamaktadırlar. Özmen ve Taşdemir (2018) panel hata düzeltme modeli kullanarak, toplam sermaye ve temel bileşenlerinin giriş ve çıkışları arasındaki ilişkiyi incelemiştir. Özmen ve Taşdemir (2018) sonuçlarına göre, uzun dönem dengeden sapma durumuna intibak, yükselen piyasa ekonomileri için sermaye çıkışları ve gelişmiş ülke ekonomileri için sermaye girişleri aracılığıyla sağlanmaktadır. Ayrıca, Özmen ve Taşdemir (2018), sermaye giriş ve çıkışları arasındaki pozitif yönlü ilişkinin (ikiz gibi davranmaları durumu) uzun dönemde geçerli olduğu ve kısa dönemde ise, geleneksel teorinin önerdiği gibi, değişkenler arasında negatif yönlü bir ilişki (uzaktan kuzen olma durumu) olduğu sonucuna ulaşmışlardır.

Dördüncü biçimlendirilmiş bulgu ise, Lucas paradoksunun doğrudan yabancı sermaye yatırımları için geçerli olmamasıdır. Ekonomi teorisi, tasarrufların sermaye-zengin (sermayenin marjinal verimliliği düşük) ülkelerden, sermaye-fakir (sermayenin marjinal verimliliği yüksek) ülkelere hareket etmesini öngörmektedir. Ancak, Lucas (1990) çalışmasında, özellikle politik risklerden kaynaklı olarak, tasarrufların sermaye-fakir ülkelerden sermaye-zengin ülkelere hareket ettiğini bulmaktadır. Bu durum, literatürde Lucas paradoksu olarak

tanımlanmaktadır. Prasad vd. (2007) yabancı sermayenin üretim süreçlerine katılımının kısıtlı olması sebebiyle, sanayileşme sürecini tamamlayamamış ülkelerde, yabancı sermaye ve ekonomik büyüme arasında negatif yönlü bir ilişki olduğunu, ancak, sanayileşme sürecini tamamlamış ülkelerde yabancı sermayenin ekonomik büyümeyi artırıcı etkisi olduğu sonucunu bulmuştur. Alfaro vd. (2008) ise Lucas paradoksunu temelde kurumsal kalitenin yetersiz olması ile açıklamıştır. Brüt ve net sermaye hareketlerini oluşturan temel bileşenlerin yıllara göre değişimi incelendiğinde, doğrudan yabancı sermaye yatırımlarının sermaye-zengin ülkelerden sermaye-fakir ülkelere hareket ettiği sonucuna ulaşılmıştır. Ayrıca, yükselen piyasa ve gelişmekte olan ülke ekonomilerinde mevcut cari açıkların temel olarak net doğrudan yabancı sermaye yatırımları ile finanse edildiği gözlemlenmiştir. Bu durum, aslında cari açıkların temelde kısa dönem sermaye hareketleri ile finanse edildiği dolayısı ile, finansal krizlerin öncü göstergesi olduğu yaygın kanısını desteklememektedir.

Bu çalışmanın üçüncü bölümünde sermaye girişlerinin nedenleri araştırılmış ve son dönem ampirik panel veri tahmin yöntemleriyle incelenmiştir. Ekonomi yazınında bu konuda yapılan ilk çalışmalar, uluslararası sermaye girişlerini ülkeye özgü faktörlerle açıklamışlardır. Ancak, Calvo vd. (1993;1996) ve Fernandez-Arias (1996) dışsal faktörlerin de en az ülkeye özgü faktörler kadar önemli olduğunu belirtmesiyle, sermaye girişlerinin nedenleri itme ve çekme faktörleri kapsamında incelenmeye başlanmıştır. Ayrıca, yazında yapılan ilk çalışmalar daha çok net sermaye girişlerinin nedenlerini araştırmıştır. Broner vd. (2013), Koepke (2019), Forbes ve Warnock (2012), Ghosh vd. (2014) tarafından da belirtildiği üzere, yatırımcıların farklı faktörlere karşı duyarlılığını göstermesi sebebiyle yapılan analizlerin "brüt" tanımı kullanılarak gerçekleştirilmesi durumunda daha sağlıklı sonuçlar elde edileceği belirtilmiştir. Blanchard vd. (2017), Igan vd. (2017) ve Eichengreen vd. (2018) tarafından da belirtildiği üzere, toplam brüt sermaye girişlerinin belirleyicileri kadar temel bileşenlerinin analizi de oldukça önemlidir. Dolayısıyla, bu çalışmanın üçüncü bölümünde yapılan ampirik analizler brüt toplam sermaye girişi ve temel bileşenlerini kapsamaktadır.

Sermaye girişlerinin nedenlerini inceleyen literatür çalışmalarına bakıldığında, döviz kuru rejimi, siyasi haklar ve sivil özgürlükler, finansal gelişme ve ticari açıklık gibi yapısal iç faktörlerin sermaye hareketlerini belirleyen önemli etkenler olduğu gözlemlenmektedir. Dolayısıyla, bu çalışmanın üçüncü bölümünün ilk kısmında, yapısal iç faktörleri de göz önünde bulundurarak (siyasi haklar ve sivil özgürlüklerin mevcudiyeti, finansal gelişme ve

ticari açıklık) sermaye hareketlerinin nedenleri itme ve çekme faktörleri bağlamında incelenmiştir. Ekonomi yazınındaki son dönem çalışmaları, genellikle panel sabit etki yöntemi kullanarak sermaye hareketlerinin belirleyicilerini açıklamıştır. Ancak, panel sabit etki yöntemi, değişkenler arasındaki eşanlılık/içsellik durumlarını dikkate almamaktadır. Bu durumu ve gecikmeli bağımlı değişkenin açıklayıcı değişkenler arasında olması ve eşanlılık ile içsellik problemlerinin de dikkate alınmasıyla, Arellano ve Bond (1991) ve Arellano ve Bover (1995) tarafından geliştirilen iki aşamalı sistem GMM yöntemi uygulanmıştır. Sermaye hareketlerinin nedenlerini incelerken temel itme faktörü olarak küresel finansal/likidite koşulları temsilen VIX değişkeni, temel çekme faktörü olarak reel GSYİH ve yapısal iç koşulları temsilen de siyasi hak ve sivil özgürlükler, finansal gelişme ve ticari açıklık değişkenleri kullanılmıştır. Sermaye hareketlerinin belirleyicilerini incelerken, çalışmada kullanılan örneklem boyutu dengelenmemiş 38 yükselen piyasa ekonomileri için 1986-2015 yıllarını kapsamaktadır. İki aşamalı sistem GMM tahmin yöntemini uygularken, VIX değişkeni dışsal bir faktör ve diğer değişkenlerin içsel faktörler olacağı varsayımı yapılmıştır. Ayrıca, endojen (içsel) değişkenlerin t-2 ve t-3 dönemlerindeki gecikmeli değeri araç değişken olarak kullanılmıştır. Bond (2002), içsel değişkenler ve bağımlı değişkene simetrik davranılması gerektiğini belirtmiştir. Bu nedenle, bağımlı değişken olan sermaye hareketlerinin de t-2 ve t-3 dönemlerindeki gecikmeli değerleri araç değişkenler arasına dahil edilmiştir. GMM sonuçlarının tutarlı parametre tahminleri sağlayabilmesi için, modelde içsel bağıntı ve aşırı belirleme (overidentification) testlerini geçmesi gerekmektedir. Bu çalışmada sunulan GMM tahmin yöntem sonuçları içsel bağıntı ve aşırı belirleme testlerini geçmektedir ve dolayısı ile elde edilen parametrelerin tutarlı olduğu belirtilmiştir.

Tablo 3.1'de sunulan tahmin sonuçlarına göre, sermaye hareketleri ve temel bileşenlerinin belirleyicilerini açıklarken, modelde yer alan temel itme değişkeni olan VIX negatif ve istatistiksel olarak anlamlıdır. Dolayısıyla, küresel finansal ve likidite koşullarında bir iyileşme olması durumunda (VIX'te görülen bir azalma), yükselen piyasa ekonomilerine toplam sermaye girişleri artmaktadır. Bu durum, toplam sermaye girişlerinin ana bileşenleri için de geçerlidir. Diğer taraftan, küresel finansal koşulların kötüleşmesi durumunda (VIX'te görülen bir artış), yükselen piyasa ekonomilerine toplam sermaye girişi azalmaktadır. GMM model sonuçlarından elde edilen bu bulgu, Rey (2016)'nın sonuçları ile tutarlıdır. Toplam sermaye, doğrudan yabancı yatırım ve bankalar arası sermaye hareketlerini açıklarken modelde kul-

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lanılan temel çekme faktörü olan ekonomik büyüme değişkeni pozitif ve istatistiksel olarak anlamlıdır. Yani, toplam sermaye, doğrudan yabancı yatırım ve bankalar arasındaki sermaye hareketleri ekonomik büyüme ile artmakta ve ekonomik daralma dönemlerinde ise azalmaktadır. GMM tahmin yöntemiyle elde edilen bu sonuç Kaminsky vd. (2004) ile tutarlı olarak, sermaye hareketleri ile ekonomik büyüme arasındaki iş çevriminin konjonktürle aynı yönde hareket ettiğini gösteren bir olgu olarak gözlemlenmektedir. Sermaye hareketlerinin belirleyicilerini açıklarken elde ettiğimiz temel itme faktöründeki bir artışın sermaye girişlerini azaltıcı etkisi olması ve temel çekme faktöründeki bir artışın sermaye girişlerini artırıcı etkisi olması sonucu, örneğin, Avdjiev vd. (2018) ile de tutarlıdır. Portföy sermaye girişlerinin temel itme faktörü ile açıklanması sonucu, Sarno vd. (2016) ve Boero vd. (2019) çalışmalarının, portföy sermaye girişlerinde itme faktörünün çekme faktörünü domine ettiği bulgusu ile tutarlıdır. Ayrıca, portföy sermaye girişlerinin temel itme faktörü ile açıklanması sonucu Eichengreen vd. (2018) çalışmasını portföy sermaye girişlerinin temel olarak itme faktörleri ile belirlendiği bulgusunu da desteklemektedir. Bunların ötesinde, çalışma sonuçları, Eichengreen vd. (2018) doğrudan yabancı yatırımların temel olarak çekme faktörü ve bankalar arasındaki sermaye girişlerinin hem itme hem de çekme faktörü tarafından belirlendiği sonucu ile tutarlıdır.

Kurumsal kaliteyi temsilen kullandığımız siyasi hak ve sivil özgürlük değişkeni toplam ve portföy sermaye girişlerinin belirleyicilerini açıklarken önemli bir faktör olarak görülmektedir. Ticari açıklığın ise sermaye hareketlerinin belirleyicileri üzerinde anlamlı bir etkisi olmadığı sonucu bulunmuştur. Literatürde yer alan çalışmalar da, ticari açıklığın, sermaye girişlerinin belirleyicileri üzerine net bir etkisi olduğu yönünde görüş birliği bulunmamaktadır. Bu durumu Heckscher-Ohlin-Mundell modeli kullanarak açıklamak mümkündür. Heckscher-Ohlin-Mundell modeline göre bir ülkenin ticari olarak daha açık olması durumunda, sermaye-fakir ülkeler için sermaye girişlerinde azalma olacağı ve sermaye girişi ve ticari açıklık arasında ikameci bir ilişki olduğunu öne sürmektedir. Diğer taraftan, Antras ve Caballero (2009) ise finansal sürtünmelerin (financial frictions) mevcut olması durumunda, ticari açıklık ve sermaye girişi arasında tamamlayıcı bir ilişki olduğu bulgusuna ulaşmışlardır. Sermaye girişlerinin belirleyicilerini araştırdığımızda, finansal gelişme ile doğrudan yabancı yatırım girişleri arasında pozitif yönlü ve anlamlı bir ilişkinin olduğu sonucuna ulaşılmıştır. Özetle, iki aşamalı sistem GMM tahmin sonuçlarına göre temel itme faktörü (vix) ve temel çekme faktörü (ekonomik büyüme) sermaye girişlerini belirleyen temel faktörlerdir. Yapısal

iç koşulların ise sadece belirli sermaye girişlerini açıklamada önemli bir rol oynadığı sonucuna ulaşılmıştır.

Ekonomik teori, güvenilir ve sürdürülebilir sabit döviz kuru rejimlerinde, kurun sabitlendiği ülkenin para politikasının kredibilitesinin ve düşük enflasyonun ithal edilmesi, işlem maliyetlerini azaltması ve döviz kuru garantisi vermesi sebebiyle daha çok sermaye girişinin gözlemleneceğini önermektedir. Sermaye hareketlerinin belirleyicilerini açıklamada döviz kuru rejiminin etkisini göz önünde bulunduran çalışmalar oldukça farklı sonuçlara ulaşmışlardır. Örnek vermek gerekirse, Magud vd. (2014) ve Boudias (2015), döviz kuru rejimlerinin sermaye hareketleri üzerinde herhangi bir etkisinin bulunmadığını belirtmişlerdir. Cerutti vd. (2017) küresel finansal koşulların sermaye hareketlerine etkisinin, döviz kuru rejimine göre değişiklik göstermediği sonucuna ulaşmıştır. Obstfeld vd. (2018) sermaye girişlerinin nedenlerini açıklarken, sabit döviz kuru rejiminde itme ve çekme faktörlerinin etkisinin daha fazla olduğunu bulmuşlardır. Öte yandan Ghosh vd. (2014) ve Calderon ve Kubota (2019) daha az esnek döviz kuru rejimi uygulayan ülkelerde, sermaye girişlerinin daha fazla olabileceğini belirtmiştir. Bu çalışmada, sermaye hareketlerinin belirleyicilerini açıklarken, döviz kuru rejiminin etkisini göz önünde bulundurarak FM-OLS yöntemi uygulanmıştır. İlan edilen yerine gerçekte uygulanan döviz kuru rejimi (DKR), Ilzetzki vd. (2017)'den takip edilerek tanımlanmıştır. Bu çerçevede, Ilzetzki vd. (2017) tarafından tanımlanan, geniş DKR1-DKR4 arasındaki rejimler dikkate alınmıştır.

Sermaye girişlerinin belirleyicilerini inceleyen çalışmalar, değişkenler arasında durağanlık ve eşbütünleşme koşullarını dikkate almamışlardır. Bu çalışmada, bu unsurlar ile beraber değişkenler arasındaki içsellik, farklı dağılım ve içsel bağıntı problemlerini de dikkate alan FM-OLS tahmin yöntemi uygulanmıştır. Bu yöntem aynı zamanda değişkenler arasında uzun dönem denge ilişkisi/eşbütünleşme bulunması durumunda, tutarlı parametrelerin tahmin edilmesini de sağlamaktadır. GMM tahmin sonuçlarından elde edilen temel bulgu, sermaye girişlerinin temel olarak itme ve çekme faktörleri tarafından belirlendiği doğrultusundadır. Bu çerçevede, itme ve çekme faktörlerinin etkisinin uygulanan döviz kuru rejimine göre değişiklik gösterip göstermediği FM-OLS yöntemi kullanılarak incelenmiştir. Ilzetzki vd. (2017) tarafından önerilen döviz kuru rejimi sınıflandırmasına göre, DKR1 ve DKR2 sabit döviz kuru rejimi ve DKR3 ve DKR4 esnek döviz kuru rejimi örneklemini oluşturmaktadır. FM-OLS yöntemi, hem tüm örneklem (DKR5 ve DKR6 dışındaki gözlemler), hem sadece sabit

DKR ve hem de esnek DKR örneklemi için uygulanmıştır. FM-OLS yönteminden elde edilen sonuçlara göre toplam sermaye girişleri hem itme hem de çekme faktörleri tarafından belirlenmektedir. Ancak, bu faktörlerin etkisi esnek döviz kuru rejiminde daha fazladır. Portföy sermaye girişleri temel olarak itme faktörleri tarafından açıklanmakta ve itme faktörlerinin etkisi DKR'ne göre değişim sergilememektedir. Doğrudan yabancı sermaye girişleri çekme faktörü tarafından belirlenmekte ve çekme faktörünün etkisi sadece esnek DKR'de anlamlı olduğu görülmüştür. Bankalar arasındaki sermaye girişleri ise tüm örneklem için sadece itme faktörü tarafından açıklanmakta ve esnek DKR'de hem itme hem de çekme faktörü tarafından belirlenmektedir.

Bu çalışmanın diğer bölümünde, döviz kuru rejiminin etkisi, Hansen (1999) tarafından önerilen panel eşik tahmin yöntemi kullanılarak incelenmiştir. Bu çerçevede, döviz kuru rejimi, sermaye hareketlerini açıklayan temel itme ve çekme faktörleri için içsel eşik değer oluşturma durumu ve temel faktörlere etkisi incelenmiştir. Değişkenler arasındaki içsellik problemi göz önünde bulundurularak, tahmin edilen modelde, çekme faktörünün (ekonomik büyüme) gecikmeli değeri kullanılmıştır. Bu bölümde, öncelikle, döviz kuru rejiminin itme faktörü için içsel eşik değer oluşturup oluşturmadığı incelenmekte ve daha sonraki aşamada ise çekme faktörü için içsel eşik değer oluşturup oluşturmadığı araştırılmaktadır. Elde edilen sonuçlara göre, toplam, portföy ve doğrudan yabancı sermaye yatırım girişlerinin belirleyicilerini açıklamada döviz kuru rejiminin içsel eşik değer oluşturduğu sonucu bulunmuştur. Toplam sermaye ve portföy girişleri için yönetimli dalgalanan DKR, doğrudan yabancı sermaye yatırımları için ise sınırlı esneklik DKR, temel itme faktörü için içsel eşik değer oluşturduğu bulgusuna ulaşılmıştır. İçsel olarak tahmin edilen DKR, Ilzetzki vd. (2017) tarafından önerilen geniş DKR sınıflandırmasında sabit döviz kuru rejimine karşılık gelmektedir. Alt rejimde (sabit döviz kuru rejimlerinde), temel itme faktörünün etkisinin her zaman negatif olmayacağı ve üst rejimde (esnek döviz kuru rejimlerinde) temel itme faktörünün etkisi negatif olacağı bulgusuna ulaşılmıştır. Bu sonuç, küresel finansal koşullarda kötüleşme olması durumunda, sabit döviz kuru rejimi uygulayan yükselen piyasa ekonomilerinde daha fazla sermaye girişi gözlemleneceğini belirtmektedir. Bu sonuç, sabit döviz kuru rejimlerinin döviz kurunda istikrarı sağlaması sebebi ile, olumsuz küresel finansal koşullardan korunma mekanizması tahsis etmesi önermesi ile tutarlıdır. Ayrıca, olumsuz küresel finansal koşullar, sermaye girişlerinin esnek döviz kuru rejimi uygulayan yükselen piyasa ekonomilerinden sabit döviz kuru

rejimi uygulayan ülkelere ya da güvenilir liman olarak bilinen gelişmiş ülkelere yönelmesine yol açtığı bulgusuna ulaşılmıştır.

Sermaye girişlerinin belirleyicilerini incelediğimiz üçüncü bölümün son kısmında ise, uygulanan döviz kuru rejiminin çekme faktörü için içsel eşik değer oluşturma durumu Hansen (1999) panel eşik tahmin yöntemi kullanılarak incelenmiştir. Tahmin sonuçlarına göre, toplam ve bankalar arasındaki sermaye hareketlerinin belirleyicilerini açıklamada, sürünen pariteler döviz kuru rejimi temel çekme faktörü içsel eşik değer oluşturmaktadır. Ayrıca, ekonomik büyüme ile temsil edilen temel çekme faktörünün etkisi uygulanan döviz kuru rejimine göre farklılık gösterdiği sonucuna ulaşılmıştır. Temel çekme faktörü, hem alt (sürünen pariteler döviz kuru rejimi uygulayan yükselen piyasa ekonomilerinde) hem de üst (esnek döviz kuru rejimi uygulayan yükselen piyasa ekonomilerinde) rejimde pozitif ve istatistiksel olarak anlamlı bulunmuştur. Ancak, temel çekme faktörünün etkisinin alt rejimde daha fazla olduğu sonucuna ulaşılmıştır.

Bu çalışmanın üçüncü bölümünden elde edilen temel sonuç, yükselen piyasa ekonomilerinde uygulanan döviz kuru rejiminin, uluslararası sermaye girişlerinin belirleyicilerini açıklamada, temel itme ve çekme faktörleri için önemli bir rolü olduğunu göstermektedir. Döviz kuru rejiminin, sermaye hareketlerinin belirleyicilerini açıklamada, içsel eşik değer oluşturma durumunun gözardı edilmesi yanıltıcı sonuçlara yol açabilecektir. Küresel finansal koşulların sermaye girişlerine etkisi esnek döviz kuru rejimi uygulama dönemlerinde daha fazla olduğu bulgusuna ulaşılmıştır. Temel çekme faktörünün etkisi ise sabit döviz kuru rejimlerinde daha fazla olduğu belirlenmiştir. Esnek döviz kuru rejimleri, uygulanacak para politikası araçlarında daha fazla bağımsızlığa olanak sağlayarak dış şoklara karşı bir tampon görevi üstlenmektedir. Bununla birlikte, esnek döviz kuru rejimlerinin belirsizlik ve kur riski içermesinden dolayı, küresel finansal koşulların kötüleşmesi durumunda yükselen piyasa ekonomilerine sermaye girişlerini azaltıcı etkisi de bulunmaktadır.

Bu çalışmanın dördüncü bölümünde ise, sermaye girişlerinin ekonomik büyümeye etkisi hem geleneksel hem de son dönem ampirik panel veri tahmin yöntemleri kullanılarak incelenmiştir. Calvo vd. (1993, 1996) yükselen piyasa ve gelişmekte olan ülke ekonomilerinde, uluslararası sermaye girişlerinin ekonomik büyümenin en temel belirleyicilerinden biri olduğunu ifade etmiştir. Lane ve Milesi-Ferretti (2018) uluslararası sermaye girişleri ve

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uluslararası finansal bütünleşmede, 1990'lı yıllar sonrasındaki büyük uyum (great moderation) döneminde büyük bir artış gözlemlendiğini belirtmiştir. Bu çerçevede, sermaye girişlerinin ekonomik büyümeye etkisinin incelenmesi daha önemli hale gelmektedir. Mundell-Fleming modeli, sermaye girişlerinin ulusal paranın değer kazanmasına yol açacağını ve dolayısıyla net ihracatı ve ekonomik büyümeyi azaltacağını önermektedir. Ancak, Blanchard vd. (2017) Mundell-Fleming modeli öngörüsününün aksine, yükselen piyasa ekonomisi politika yapıcılarının, sermaye girişlerinin finansal kısıtı azaltarak, ekonomik büyüme üzerinde genişletici etkisi beklentisinde olduğunu belirtmiştir. Blanchard vd. (2017) yükselen piyasa ekonomisi politika yapıcılarının beklentileri ve Mundell-Fleming modelin öngörüleri arasında uzlaşı olup olmadığı sorunsalını incelemiştir. Blanchard vd. (2017) sonuçlarına göre, yabancı yerleşikler tarafından satın alınan borç senetlerinin yani tahvil girişlerinin ekonomik büyümeyi azaltıcı ve tahvil dışındaki sermaye girişlerinin ise ekonomik büyümeyi artırıcı etkisinin olduğunu bulmaktadır.

Ekonomik büyümeyi inceleyen çalışmalar, temel olarak, içsel ve dışsal büyüme modelleri olarak tanımlanmaktadır. İçsel büyüme modellerinin savunduğu temel argüman, teknolojik gelişme ve fiziksel sermaye miktarındaki artış ile sürekli büyümenin sağlanacağı ve dolayısıyla durağan dengeye ulaşılamayacağıdır. Ancak, dışsal büyüme modelleri fiziksel sermaye miktarındaki artışın ekonomik büyümeye doğrudan yansımayacağını, fiziksel sermayenin bir dönemden diğerine aktarılması durumunda, belirli bir aşınma oranına tabi olacağını belirtmiştir. Bu noktada, Solow (1956) ekonomik büyümenin temelde tasarruf oranları ve nüfus tarafından belirleneceğini önermektedir. Mankiw vd. (1992), Solow modelinin önermelerini ampirik olarak incelemiş ve ülkeler arasındaki gelir farklılıklarının, tasarruf oranı, eğitim ve nüfus değişkenlerindeki farklılaşma ile açıklanabileceğini göstermiştir. Ekonomik büyüme yazını, Mankiw vd. (1992) ile önemli bir ivme kazanmıştır. Ancak, yapılan ampirik çalışmaların çoğunluğu yatay kesit yöntemi kullanması sebebiyle ekonometrik yönden de eleştirilere maruz kalmıştır. Bu durumu bir örnek ile açıklayacak olursak, büyüme literatüründe yakınsama[1] durumunun gerçekleşip gerçekleşmediğini ölçmek için tahmin edilen ekonometrik modellere başlangıç gelir düzeyleri[2] konmaktadır. Ayrıca, ülkeler arasında za-

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[1] Ülkelerin başlangıç gelir düzeyleri veri alındığında durağan dengeye ne kadar hızlı ulaştıklarını göstermek için kullanılmaktadır.

[2] Başlangıç gelir düzeyi çoğunlukla ya bağımlı değişken olan gelirin gecikmeli değeri ya da çalışmanın zaman boyutunun başlangıç yılına tekabül eden gelir düzeyi olarak tanımlanmaktadır.

mana göre değişmeyen kültür, inanç vb. gibi değişkenleri dikkate almak amacıyla sabit terim eklenmektedir. Bu noktada, başlangıç gelir düzeyi ve sabit terimin, panel sabit etki yöntemi kullanılarak tahmin edilebilmesi, sözkonusu değişkenler arasında tam çoklu bağıntı nedeniyle mümkün değildir. Ayrıca, ekonomik büyümenin belirleyicilerini inceleyen çalışmalar, genellikle iş çevrimlerinin etkisini arındırmak amacıyla, verilerin beş yıllık ortalamalarını kullanarak ampirik analizler gerçekleştirmektedir. Durlauf vd. (2005) ise, verilerin beş yıllık ortalamasını almanın ekonometrik bir temele dayanmadığını belirtmiştir.

Toplam sermaye girişleri ve temel belirleyicilerinin ekonomik büyümeye etkisini incelemek için, farklı panel veri tahmin yöntemleri uygulanmıştır. Genel büyüme literatüründe yer alan başlangıç gelir düzeyi ve beşeri sermaye gibi temel değişkenlerin kullanılmasının yanı sıra küresel finansal koşullar ve finansal gelişme düzeyi gibi faktörler de dikkate alınmıştır. Kose vd. (2012) ve Erdem ve Özmen (2015) küresel finansal koşulların ekonomik büyüme ve iş çevrimlerinin en temel belirleyicilerinden olduğunu belirtmişlerdir. King ve Levine (1993) ve Levine (2005) finansal gelişme ve finansal aracılık faaliyetlerindeki iyileşmenin, riskin çeşitlendirilmesinde ve kaynakların verimli tahsisini sağlamada önemli rol oynadığını ve dolayısıyla, ekonomik büyümeyi etkileyeceğini belirtmişlerdir. Bu nedenle, ekonomik büyümenin belirleyicilerini incelerken bu faktörlere de yer verilmiştir. Cline (2015) ülkeler arasındaki ekonomik büyümeye ilişkin elde edilen bulguların test edilebilir olması için karşılaştırılabilir gelir serilerinin kullanılması gerektiğini belirtmiştir. Bu nedenle, bağımlı değişken olarak hem kişi başı reel gelir hem de satın alma gücünü dikkate alan kişi başı gelir serileri kullanılmıştır.

İktisat yazınında yer alan çalışmalara bakıldığında, sermaye girişlerinin ekonomik büyüme üzerindeki etkisine ilişkin görüş birliği bulunmamaktadır. Örnek olarak, Combes vd. (2019) sermaye girişlerinin, düşük ve orta gelirli ülke ekonomilerinde büyümeyi artırıcı etkisi olduğunu belirtmektedir. Reinhart vd. (2008) ise yüksek sermaye girişlerinin, tüketim harcamalarında daha fazla dalgalanmaya ve ülkelerin krize yakalanma olasılıklarını arttırmaya yol açması sebebiyle, ekonomik büyümeyi azaltıcı etkisi olduğunu bulmaktadır. Diğer taraftan, Caballero vd. (2010), büyük çapta sermaye girişlerinin ekonomik büyümeyi artırdığını ve sermaye girişlerinde ani duruş durumunda ise ekonomik büyümenin azaldığı bulgusuna ulaşmaktadır. Eng ve Wong (2016) ise, sermaye girişlerinin ekonomik büyümeye etkisinin olmadığını, ancak ani sermaye çıkışlarının ise ekonomik büyümeyi azaltıcı etkisi olduğu sonucuna ulaş-

maktadır. Durham (2004), doğrudan yabancı sermaye ve portföy girişlerinin ekonomik büyüme üzerindeki etkisinin, ülkelerin finansal gelişme düzeylerine göre değişim sergilediğini belirtmektedir. Kyaw ve Macdonald (2009) doğrudan yabancı sermaye ve portföy girişlerinin, orta gelirli ülke grubunda genişletici etkisi bulunduğunu belirtmektedir.

Ekonomi yazınındaki çalışmalar, genellikle "net" sermaye girişlerini dikkate almakta veya toplam sermaye girişleri ya da sadece doğrudan yabancı yatırım girişleri üzerinde yoğunlaşmaktadır. Bu çerçevede, brüt sermaye girişleri ve temel alt kalemlerini dikkate alan çalışmalar sınırlı sayıdadır. Bu çalışmanın dördüncü bölümünde, yapılan ampirik incelemelerde brüt sermaye girişlerinin ve temel alt kalemlerinin ekonomik büyümeye etkileri incelenmektedir. Ayrıca, çalışmaların çoğunluğu panel sabit etki yöntemini kullanmakta ve değişkenler arasında içsellik/eşanlılık, durağanlık ve eşbütünleşme durumlarını dikkate almamaktadır. Yaygın ampirik büyüme modelleri, genellikle panel sabit etki yöntemi kullanmakta ve belirli bir yıl için sabit olan (örneğin, 1985 yılı) reel gelir düzeyini başlangıç geliri olarak tanımlamaktadır. Bu durum, aslında, denklemlerde başlangıç geliri ve sabit terimin aynı anda kullanılmasını, tam çoklu bağıntı (perfect multicollinearity) nedeniyle, engellemektedir. Bunun sonucunda, söz konusu büyüme modelleri sabit terim içermeksizin tahmin edilmekte ve başlangıç geliri katsayısı yakınsama (convergence) göstergesi olarak yorumlanmaktadır. Ancak, bu çalışmada, bu tür bir yaklaşımın yakınsama katsayısını mı yoksa ülkeler arasındaki gelir farklılıklarını mı temsil ettiği belirsizleşmekte ve bu ayırdetme (identification) sorununun yanıltıcı sonuçlara yol açabileceği gösterilmektedir. Bu çalışmada, belirtilen tüm bu önemli unsurlar dikkate alınmakta ve geleneksel panel veri tahmin yöntemlerinin yanısıra, içsellik/eşanlılık ve gecikmeli reel gelirin açıklayıcı değişkenler arasında bulunmasını da dikkate alan Arellano ve Bond (1991) ve Arellano ve Bover (1995) tarafından geliştirilen iki aşamalı sistem GMM tahmin yöntemi kullanılmaktadır. İktisadi yazında yer alan ampirik büyüme çalışmalarından farklı olarak, küresel finansal koşullar da büyümenin temel belirleyicilerinden biri olarak dikkate alınmıştır.

Alternatif reel gelir serilerinin de dikkate alındığı panel en küçük kareler yöntemi sonucuna göre portföy girişlerinin ekonomik büyümeye anlamlı bir etkisinin olmadığı ancak toplam sermaye, doğrudan yabancı yatırım ve bankalar arasındaki sermaye girişlerinin ekonomik büyümeyi artırıcı etkisinin olduğu bulgusuna ulaşılmıştır. Ayrıca, beşeri sermaye ve finansal gelişmenin ekonomik büyümeye olumlu katkı sağladığı belirlenmiştir. Küresel

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finansal koşullarda iyileşme olması, yani VIX değişkeninin azalması, durumunda ekonomik büyümenin arttığı sonucuna ulaşılmıştır. Panel sabit etki yöntemi uygulandığında elde edilen sonuçlar yaklaşık olarak panel en küçük kareler yönteminden elde edilen sonuçlar ile aynıdır.

İki aşamalı sistem GMM model tahminlerinde, küresel finansal koşullar dışsal, yurtiçi değişkenler (beşeri sermaye, finansal gelişmişlik düzeyi, başlangıç geliri ve toplam sermaye girişleri ve temel bileşenleri) içsel olarak kabul edilmiştir. Model tahminlerinde, içsel değişkenlerin t-1, t-2 ve t-3 gecikmeli değerleri araç değişkenleri olarak kullanılmıştır. Sermaye girişlerinin ekonomik büyümeye etkisi incelenirken, çalışmada kullanılan örneklem boyutu dengelenmemiş 52 yükselen piyasa ve gelişmekte olan ülke ekonomileri için 1995-2015 yıllarını kapsamaktadır. İki aşamalı sistem GMM tahmin yönteminden elde edilen sonuçlar, sermaye girişleri ve temel alt kalemlerinin ekonomik büyüme üzerinde genişletici etkisi olduğunu göstermektedir. Ayrıca, beşeri sermaye, finansal gelişmişlik düzeyi ve olumlu küresel finansal koşulların da ekonomik büyümeye katkı sağladığı sonucuna ulaşılmaktadır.

Yaygın ekonomik büyüme yazını, değişkenler arasındaki durağanlık ve eşbütünleşme durumunu göz önünde bulundurmadan geleneksel panel veri tahmin yöntemleri uygulamakta olduğu için yanıltıcı sonuçlara yol açabilir. Bu nedenle, bu çalışmanın dördüncü bölümünde değişkenlerin durağanlık ve eşbütünleşme özellikleri de göz önünde bulundurulmuştur. Ekonomik büyümenin belirleyicilerini açıklarken kullanılan değişkenlerin birinci dereceden durağan olduğu sonucuna ulaşılmıştır. Çalışmanın sonraki bölümünde, değişkenlerin durağanlık ve eşbütünleşme durumları dikkate alınarak Phillips ve Hansen (1990) ve Pedroni (2001) tarafından geliştirilen FM-OLS yöntemi uygulanmıştır. FM-OLS tahmin yöntemi, değişkenler arasında uzun dönem denge ilişkisi (eşbütünleşme) olması durumunda tutarlı parametre tahminine olanak sağlamasının yanısıra, içsellik, dağılım farklılığı ve içsel bağıntı unsurlarını da göz önünde bulundurmaktadır. Yapılan ampirik analizlerde, ekonomik büyümenin temel belirleyicilerinin yanısıra, yapısal iç koşullar da (beşeri sermaye, finansal gelişmişlik düzeyi, dış ticaret açıklığı, finansal açıklık, kurumsal yönetişim) dikkate alınmıştır. FM-OLS tahmin sonuçları, sözkonusu değişkenler arasında, büyümeyi açıklayan uzun dönem denge ilişkisi (eşbütünleşme) olduğunu göstermektedir. FM-OLS yöntemi uygulanarak elde edilen sonuçlara göre, toplam sermaye girişleri ve temel bileşenleri uzun dönemde ekonomik büyümeyi olumlu yönde etkilemektedir. Beşeri sermaye, finansal gelişme ve küresel finansal koşullarda iyileşme olması durumunda da ekonomik büyümenin arttığı bulunmuştur. Kurum-

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sal yönetişim (governance), ticari açıklık ve finansal açıklık gibi yapısal iç koşulların da uzun dönem ekonomik büyümeyi artırdığı sonucuna ulaşılmıştır.

Granger temsil kuramına göre, eşbütünleşme (hata düzeltme süreci) varsa, hata düzeltme süreci (eşbütünleşme) vardır. Bu çerçevede, sözkonusu değişkenler arasında büyümeyi açıklayan hata düzeltme modeli tahmin edilmiştir. İktisat yazınında yer alan çalışmalar, sermaye girişlerinin ekonomik büyümeye etkisini incelerken, genellikle kısa ve uzun dönem ayrımı yapmamışlardır. Bu çalışmada, panel oto-regresif dağıtılmış gecikmeler (PARDL) yöntemi kullanılarak sermaye girişleri ve temel bileşenlerinin kısa ve uzun dönem ekonomik büyümeye etkisi incelenmiştir. Bu çerçevede, bu çalışma, sermaye girişlerinin ve temel belirleyicilerinin genişletici etkisinin olup olmadığını incelemesi, ekonomik büyümenin belirleyicileri arasında içsellik, farklı dağılım, durağanlık ve eşbütünleşme, hata düzeltme mekanizması, kısa ve uzun dönem dinamikleri durumlarını dikkate alarak uyguladığı ampirik yöntemler ile ekonomik büyüme yazınına katkı sağlamaktadır.

Ekonomik büyümenin, kısa ve uzun dönem dinamiklerini incelemek için, panel içsel bağıntı dağıtılmış gecikmeler modeli (PARDL) tahmin edilmiştir. PARDL modelinde, gecikme değerinin belirlenmesi için geleneksel bilgi kriterlerinden ziyade, Han vd. (2017) tarafından önerilen geliştirilmiş Bayesian bilgi kriteri kullanılmıştır (modified Bayesian information criteria, MBIC). Han vd. (2017) geleneksel bilgi kriteri kullanılması durumunda gecikmeli değer seçimi geniş tutulduğunu ve tutarsız olduğunu belirtmiştir. Bu nedenle, MBIC'nin kullanılmasını önermektedir. PARDL model sonuçlarına göre, ekonomik büyüme, FM-OLS ile tahmin edilen, uzun dönem denge ilişkisinden sapmalara intibak etmektedir (hata düzeltim mekanizması). Bu durumun, sadece toplam sermaye girişleri için değil, sermaye girişlerinin temel alt kalemleri için de geçerli olduğu bulunmuştur. Portföy sermaye girişlerinin ekonomik büyümeyi kısa dönemde etkilemediği, ancak uzun dönemde belirleyici olduğu sonucuna ulaşılmıştır. Diğer taraftan, toplam sermaye, doğrudan yabancı yatırım ve bankalar arasındaki sermaye girişlerinin, hem kısa dönemde hem de uzun dönemde, ekonomik büyümeyi artırıcı etkisinin bulunduğu anlaşılmaktadır. Ayrıca, beşeri sermaye ve ticari açıklığın kısa dönemde ekonomik büyümeyi etkilemediği, sadece uzun dönemde ekonomik büyümeye yol açtığı sonucuna ulaşılmıştır. Daha iyi kurumsal yönetişim, finansal açıklığın artması ve küresel finansal/likidite koşullarında iyileşme olması durumlarında ise, ekonomik büyümenin hem kısa dönemde hem de uzun dönemde arttığı bulgusuna ulaşılmıştır.

Bu çalışmadan elde edilen ampirik sonuçlar, toplam sermaye girişleri ve temel bileşenlerinin temel itme (küresel finansal koşullar) ve çekme (ekonomik büyüme) faktörlerinin yanısıra yapısal iç koşullar tarafından da açıklandığını göstermektedir. Temel itme faktörü olarak kullanılan VIX değişkeninin, küresel finansal koşulları göstermekte olduğu ve küresel finansal koşullarda iyileşme olması durumunda, yükselen piyasa ekonomilerine sermaye girişlerinin arttığı sonucuna ulaşılmıştır. Temel çekme faktörü olarak ekonomik büyüme arttıkça, sermaye girişlerinin arttığı bulgusuna ulaşılmıştır. Bu durum, yükselen piyasa ekonomilerinde, sermaye girişlerinin iş çevrimleri ile yöndeş (procyclical) olduğunu göstermektedir. Bu yöndeşlik, ekonomik büyüme dönemlerinde sermaye girişleri artarak büyümeyi daha da hızlandırdığını, daralma dönemlerinde ise, sermaye girişlerinin azalarak daralmanın daha derinleşmesine yol açtığını önermektedir. Bunun sonucunda, sermaye hareketleri, yükselen piyasa ekonomilerinde iş çevrimlerinin boyut ve derinliğini arttırmaktadır. Kaminsky vd. (2004) tarafından önerildiği gibi sermaye girişlerinin yağdı mı sağanak gibi yağdığı (when it rains, it pours) betimlemesini desteklemektedir.

Yapısal iç koşulların ise, sermaye girişleri üzerinde etkisinin olduğu bulunmaktadır. Ayrıca, toplam sermaye girişlerinin hem itme hem de çekme faktörleri, portföy girişlerinin itme faktörü tarafından, doğrudan yabancı yatırımların çekme faktörü tarafından ve bankalar arasındaki sermaye girişlerinin ise hem itme hem de çekme faktörleri tarafından açıklandığı bulgusuna ulaşılmıştır. Model tahmin sonuçları, sermaye girişlerinin belirleyicilerini açıklamada, itme ve çekme faktörlerinin etkisinin ülkede uygulanan döviz kuru rejimine göre değişmekte olduğu önermesini desteklemektedir. Sermaye girişlerinin belirleyicilerini açıklarken, itme ve çekme faktörlerinin etkisinin esnek döviz kuru rejimleri dönemlerinde daha fazla olduğu bulgusuna ulaşılmıştır. Bu durumun, sabit döviz kuru rejiminin, döviz kurundaki belirsizliği ortadan kaldırması, işlem maliyetlerini azaltması ve olası risklerin çeşitlenmesinden kaynaklı olabileceği belirtilmiştir. Bu nedenle, sürdürülebilir ve güvenilir sabit döviz kuru rejimlerinin, yükselen piyasa ekonomilerinin olumsuz küresel finansal koşulların etkisinden korunma sağlaması özelliği ile tutarlıdır. Toplam sermaye girişleri ve temel bileşenlerinin ekonomik büyümeye etkisi incelendiğinde ise, portföy sermaye girişlerinin uzun dönemde ekonomik büyümeyi artırdığı sonucuna ulaşılmıştır. Ayrıca, toplam sermaye, doğrudan yabancı yatırım ve bankalar arasındaki sermaye girişlerinin hem kısa hem uzun dönemde ekonomik büyümeyi artırdığı bulgusu sunulmuştur.

Bu çalışmadan elde edilen temel sonuçlar, küresel finansal koşulların, hem sermaye girişlerinin hem de ekonomik büyümenin belirleyicileri arasında olduğunu göstermektedir. Yükselen piyasa ekonomilerinin sağlam yapısal dinamiklere sahip olması, küresel finansal/likidite koşullarının olumsuz etkilerinden korunabilmelerine olanak sağlayabilecektir. Uluslararası sermaye hareketlerinin nedenleri ve sonuçlarını incelemeyi amaçlayan gelecek çalışmaların, küresel finansal koşulları, döviz kuru rejimlerini ve yapısal iç koşulları da dikkate alması önerilmektedir.

APPENDIX F

THESIS PERMISSION FORM / TEZ İZİN FORMU

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Adı / Name : FATMA
Bölümü / Department : İktisat

<u>TEZİN ADI</u> / TITLE OF THE THESIS (İngilizce / English) : THE CAUSES AND CONSEQUENCES OF INTERNATIONAL CAPITAL FLOWS: AN EMPIRICAL INVESTIGATION

<u>TEZİN TÜRÜ</u> / <u>DEGREE:</u> Yüksek Lisans / Master ☐   Doktora / PhD ■

1. Tezin tamamı dünya çapında erişime açılacaktır. / Release the entire work immediately for access worldwide. ■

2. Tez <u>iki yıl</u> süreyle erişime kapalı olacaktır. / Secure the entire work for patent and/or proprietary purposes for a period of <u>two years</u>. * ☐

3. Tez <u>altı ay</u> süreyle erişime kapalı olacaktır. / Secure the entire work for period of <u>six months</u>. * ☐

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