ERC Working Papers in Economics 19/02
March / 2019

GLOBALISATION AND GOVERNANCE: THRESHOLDS FOR THE IMPACTS OF THE MAIN DETERMINANTS OF CAPITAL INFLOWS?

Erdal Özmen
Department of Economics, Middle East Technical University, Ankara, Turkey
E-mail: ozmen@metu.edu.tr

Fatma Taşdemir
Department of Economics, Sinop University, Sinop, Turkey
E-mail: ftasdemir@sinop.edu.tr

GLOBALISATION AND GOVERNANCE: THRESHOLDS FOR THE IMPACTS OF THE MAIN DETERMINANTS OF CAPITAL INFLOWS?

Erdal Özmen
Middle East Technical University, Department of Economics, Ankara, Turkey
E-mail: ozmen@metu.edu.tr

and

Fatma Taşdemir
Sinop University, Department of Economics, Sinop, Turkey
E-mail: ftasdemir@sinop.edu.tr

ABSTRACT

This paper investigates whether the impacts of the main push (global financial conditions, GFC) and pull (growth) factors on capital inflows are invariant to endogenously estimated threshold levels for structural domestic conditions (SDC) represented by governance/institutional quality, trade openness, *de facto* international financial integration and *de jure* financial openness in emerging market and developing economies. Our results strongly suggest that, for all the components of capital inflows, the impact of the domestic pull factor is substantially much higher for the episodes of better governance, higher trade and *de jure* financial openness and *de facto* international financial integration. The sensitivity of non-FDI and aggregate inflows to GFC is highly significant and tends to be considerably higher for countries with better SDC. FDI inflows are found to be basically determined by the domestic pull factor across all these regimes. The impact of GFC on FDI inflows appears not to considerably change across the SDC.

Key words: Capital Inflows, Developing Countries, Emerging Market Economies, International Financial Integration, Financial Openness, Foreign Direct Investments, Global Financial Conditions, Governance, Panel Threshold Model.

JEL Classification: E02, F21, F30, F32, F41,

1. Introduction

International capital flows have often been found amongst the main determinants of growth dynamics and business cycles in emerging market (EME) and developing (DE) economies as suggested by the seminal contributions of Calvo et al. (1993, 1996). The recent literature, including Kose et al., (2011); Erdem and Özmen (2015) and Rey (2016), often provides strong empirical support to this important postulation. The dramatic increase in capital flows and thus financial globalization (Lane and Milesi-Ferretti, 2018) during the recent decades has led the causes and consequences of capital flows to be increasingly much more topical in international macroeconomics.

Following Calvo et al. (1993, 1996), the recent literature (see, e.g., Forbes and Warnock, 2012; Montiel, 2014; Avdjiev, et al. 2017, Koepke, 2018) often classifies the main determinants of capital flows mainly as country-specific (pull) and common global (push) factors. The "push" factors refer to changes in global financial conditions and monetary policy stance in advanced economies. Rey (2015, 2016) and Passari and Rey (2015) convincingly argues that the VIX index (Chicago Board Options Exchange's equity option volatility index) proxies global financial cycle which is closely associated with capital flows, credit growth and asset prices. The "pull" factors are basically the variables representing domestic macroeconomic conditions. These include a broad range of factors such as growth, interest rate differentials, international financial integration/openness and trade openness, institutional quality and governance.

The findings by Ahmed and Zlate (2014) support the postulation that both domestic pull factors (growth and interest rate differentials) and global risk appetite are significant determinants of net capital flows to EME. Forbes and Warnock (2012) reports that the global financial conditions (GFC) is the only variable explaining surges and stops in capital flows. According to Bruno and Shin (2015), GFC have a larger impact than domestic factors in more financially open economies with larger banking flows. In a similar vein, Sarno et al. (2016) and Boero et al. (2019) suggest that global push factors prevail over domestic variables in explaining movements in international portfolio flows. According to Rey (2016), capital inflows (except foreign direct investments, FDI) are negatively correlated with the GFC proxied by VIX. The results of Özmen and Taşdemir (2018) provide an evidence supporting that endogenously estimated *de facto* exchange rate regime thresholds do matter especially for the impact of GFC. Avdjiev et al. (2018) 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 Eichengreen et al. (2018) suggest that FDI are driven mainly by pull

factors, portfolio flows seem to be driven mainly by push factors whilst other investment flows are driven by both push and pull factors.

The literature provide results suggesting that, structural domestic conditions including higher international financial integration, capital account openness, better governance or investment environment (institutional quality) and higher trade openness are important in explaining[1] capital inflows into emerging market (EME) and developing (DE) economies (EMDE). Montiel (2014) convincingly argues that improvements in the domestic institutional environment along with policies towards easing or completely removing formal capital account restrictions provide more scope both for pull and push factors to induce higher capital flows. In this vein, Alfaro et al. (2008) finds that institutional quality (measured by the ICRG rating of investment risk) is an important determinant of capital flows from rich to poor countries. Ghosh et al. (2014) finds that EMEs with more financial openness (measured by the *de jure* Chinn-Ito index) or stronger investment climate (institutional quality) are more likely to experience exceptionally large net capital inflows (surges). Furceri et al. (2012), however, finds that surges in capital inflows substantially increases the probability of a financial crisis. Bryne and Fiess (2016) reports that financial openness and institutional quality matter for capital inflows to EMEs. According to Eichengreen et al. (2018) better investment climate is associated with larger FDI inflows albeit this appears not to be the case for non-FDI inflows. Davis and van Wincoop (2018) provides a theoretical model and an empirical support for their postulation that higher *de facto* financial globalization (measured as the sum of external assets and liabilities as a fraction of GDP) increases the correlation between gross capital inflows and outflows, whilst trade openness (exports plus imports as a fraction of GDP) does the opposite.

All these indeed may be interpreted as serving as a basis for positing the presence of some threshold conditions for the impacts of the main determinants of capital inflows. Structural domestic factors such as institutional environment and degree of capital account openness, according to Montiel (2014, p. 601), "are likely to interact in nonlinear ways to determine the magnitude and allocation of capital flows" and this important issue "has rarely been recognized in the literature". In this context, the literature is yet to comprehensively investigate whether the main structural domestic conditions such as international financial integration, capital account openness, institutional quality and trade openness provide endogenous thresholds for

[1] These structural domestic factors are also often found to play important roles in experiencing the benefits of capital inflows and thus international financial integration (see, for instance, Kose et al. 2011 and Slesman et al. 2015).

the impacts of basic pull and push factors on capital flows[2]. In this context, the main aim of this paper is to investigate this important issue empirically for a balanced panel of EMDE by employing panel threshold procedure of Hansen (1999). To this end, in accord with the main findings of the recent literature, we postulate global financial conditions proxied by VIX as the main push factor and lagged real GDP growth (GROWTH) as the main pull factor to explain capital inflows in EMDE. Following Eichengreen et al. (2018), we consider not only the aggregate inflows but also FDI and non-FDI inflows (portfolio equity, portfolio debt and other investment inflows). The results by Eichengreen et al. (2018) suggest that FDI and non-FDI inflows behave differently such that FDI inflows are more stable than non-FDI inflows.

The plan of the rest of this paper is follows. The following section presents our estimation results. In Section 2.1, we first consider governance and institutional quality as a threshold variable for the impacts of the main push and pull factors (VIX and GROWTH). Section 2.2 postulates trade openness as the thresholding variable. In Section 2.3, we consider the two widely used measures of financial globalization. The first one is the *de facto* measure of international financial integration proposed by Lane and Milesi-Ferretti (2007) whilst the second one is the *de jure* financial openness measure of Chinn and Ito (2006). Finally, Section 3 presents an evaluation of our main findings.

2. The Structural Pull Factors as Thresholds: Empirical Results

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

$$CIF_{it} = a_0 + a_1 GROWTH_{it-1} + a_2 vix_t + u1_{it} \quad (1)$$

In (1), the subscript i and t denote, respectively country and time, CIF is gross capital inflows scaled by GDP in current US dollars[3], GROWTH is the annual real GDP growth and vix is the natural log. of the VIX (Chicago Board Options Exchange's equity option volatility index) to proxy the global financial cycle. A decrease in VIX is associated with a greater risk-

[2] Exchange rate regime (ERR) is also another important structural factor to explain capital flows. The literature, however, provides mixed and often conflicting results on this issue. The results by Obstfeld et al. (2018) suggest that the transmissions of global financial shocks and domestic pull factors are magnified under a fixed ERR relative to more flexible regimes in EME. Özmen and Taşdemir (2018) finds that the impact of the external financial conditions on capital inflows increases with ERR flexibility.

[3] All capital flows data, measured in US dollars, are from International Financial Statistics of the International Monetary Fund (IMF). Following the IMF's Balance of Payments Statistics Yearbooks, capital inflows are defined as net purchases of domestic assets by foreign residents. The real GDP data are from World Bank World Development Indicators. The VIX data are from Chicago Boards Options Exchange website.

appetite or better global financial conditions. We postulate that capital inflows may parsimoniously be explained by the main pull (GROWTH) and push (vix) factors. Considering the potential endogeneity of real GDP growth for the evolution of capital flows, we consider lagged GROWTH in (1).

The benchmark equation (1) maintains that the impacts of the main pull and push factors are invariant to the structural domestic conditions (SDC). Alternatively, a variable representing SDC may behave as an endogenous threshold magnifying the impacts of the main determinants of capital inflows. In the context of the panel fixed effect threshold model of Hansen (1999), we consider the following specification:

$$CIF_{it} = b_0 + b_1 vix_t\ (SDC \leq \lambda) + b_2 vix_t\ (SDC > \lambda) + b_3 GROWTH_{i,t-1}\ (SDC \leq \lambda) + b_4 GROWTH_{i,t-1} (SDC > \lambda) + u2_{it} \quad (2)$$

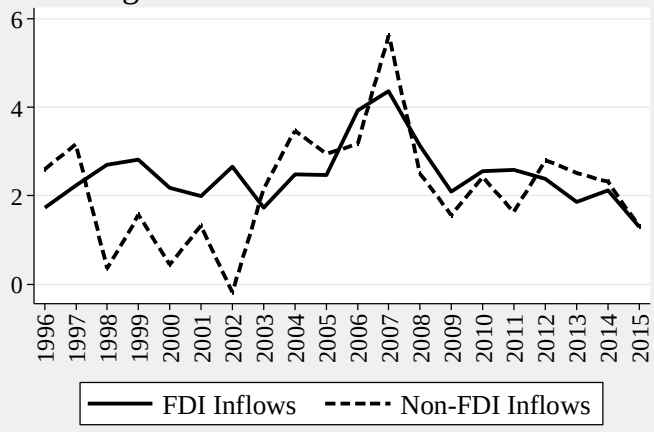
In (2), λ is endogenously estimated threshold value for the SDC. Under the null hypothesis that $b_1 = b_2$ and $b_3 = b_4$ in (2), there are no significant thresholds for the effects of the SDC and thus we obtain (1).

We estimate the equation aggregate and for the two main components of gross capital inflows (FDI and non-FDI). Our balanced panel data contain 39 emerging market or developing economies[4] (EMDE) 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.

Figure 1 presents the evolution of mean FDI and non-FDI inflows (scaled by GDP in current US dollars) to EMDE during the sample period. FDI and non-FDI inflows tend to be roughly equal in magnitude and volatility during the recent period covering the years after 2002. For the period before 2002, FDI inflows appears to be considerably higher and more stable than non-FDI inflows. The following sections investigates whether these differences may be explained by the impacts of the main pull and push factors depending on the structural domestic conditions.

[4] The EMDE sample comprises Argentina, Belarus, Botswana, Brazil, Bulgaria, Chile, China, Colombia, Croatia, Czech R., Dominican R., Ecuador, Egypt, Estonia, Hungary, Indonesia, Israel, Kenya, Latvia, Lithuania, Mali, Mexico, Moldova, Pakistan, Peru, Philippines, Poland, Romania, Russian F., Senegal, Slovakia, Slovenia, S. Africa, S. Korea, Swaziland, Thailand, Togo, Turkey, Ukraine.

Figure 1: FDI and Non-FDI Inflows



2.1. Governance and Institutional Quality

The conventional theory often suggests that higher institutional quality and governance enhances both capital inflows and benefits from international financial integration mainly by providing better legal infrastructure strengthening property rights, promoting transparency and accountability and reducing adverse selection and moral hazard. Kose et al. (2011), for instance, finds that, the level of institutional quality (measured by the World Bank Governance Indicators, WBGI) provides a certain threshold to achieve the benefits of international capital integration and thus capital flows. In a similar vein, Alfaro et al. (2008) suggests that low institutional quality (measured by the 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). Ghosh et al. (2014) finds that EMEs with stronger investment climate (institutional quality) are more likely to experience exceptionally large net capital inflows (surges). Bryne and Fiess (2016) reports that financial openness and institutional quality matter for capital inflows to EMEs. According to Eichengreen et al. (2018) better investment climate is associated with larger FDI inflows albeit this appears not to be the case for non-FDI inflows.

To investigate whether governance (GOV), based on WBGI, provides an endogenous structural domestic condition for the main determinants of capital inflows we consider the following specification:

$$CIF_{it} = b_0 + b_1 vix_t\ (GOV \leq \lambda) + b_2 vix_t\ (GOV > \lambda) + b_3 GROWTH_{i,t-1}\ (GOV \leq \lambda) + b_4 GROWTH_{i,t-1}\ (GOV > \lambda) + u2_{it} \quad (3)$$

The WBGI cover six aspects of institutional quality and governance: voice and accountability, political stability and violence, government effectiveness, regulatory quality, rule of law and control of corruption (Kaufmann et al. 2005). These variables are standardized around zero mean and unit standard deviation to have values between -2.5 and 2.5 with higher values representing better institutional quality. In (3), following Kose et al. (2011), we use a simple average of the six indices as a proxy for aggregate institutional quality and governance (GOV). For our sample of emerging market and developing countries (EMDE), the mean (standard deviation) of GOV is -0.02 (0.619), ranging from -1.17 to 1.25.

Table 1 presents the results of the estimation of Eq. (3) employing the Hansen (1999) procedure. The equation specifies that the impacts of the main push (GFC, proxied by vix) and pull (GROWTH) factors may not be invariant to institutional quality (GOV). For aggregate, FDI and non-FDI inflows, the threshold level of institutional quality is estimated as around 0.2. According to NT_{TH}, around 40 % of our observations are above the estimated threshold level[5]. Better governance (higher than the threshold level) appears to be associated with much higher mean inflows for all the capital inflows types according to the descriptive statistics presented by the table. The results by Table 1 strongly suggest that, both the impacts of the main pull and push factors depends on the prevailing institutional quality. The sensitivity of aggregate and non-FDI inflows to GROWTH is substantially much higher in EMDE with better institutional quality and governance. A similar, albeit with a smaller magnitude, appears to be the case for the impact of GFC. The recent literature, including Eichengreen et al. (2018), often finds that domestic pull factors are amongst the dominant determinants of FDI inflows. Supporting these findings, the impact of GFC tend to be insignificant for both of the governance regimes.

[5] The number of observations belonging to different regimes is, indeed, crucially important for the empirical validity of results. This is because, in the absence of a positive degrees of freedom for the estimation of the equation of interest for estimated regimes, the parameters may indeed be representing some outliers rather than a regime change. Unfortunately, this important point has been often ignored in the related empirical literature.

Table 1. Governance and Capital Inflows			
	Aggregate Capital inflows	Non-FDI inflows	FDI inflows
Threshold GOV F_B[.]	0.17 25.9[0.01]	0.21 25.9[0.01]	0.19 15.7[0.08]
NT_{TH}	314	306	309
Mean (s.d)$^{++}$ $GOV \leq \lambda$ $GOV > \lambda$	 3.65 (5.28) 6.29 (8.06)	 1.71 (4.51) 3.01 (6.82)	 2.00 (2.09) 3.26 (3.92)
The Determinants of Capital Inflows			
$Growth_{i,t-1}$ $GOV \leq \lambda$	0.156 (0.065)**	0.122 (0.061)**	0.043 (0.022)*
$Growth_{i,t-1}$ $GOV > \lambda$	0.726 (0.135)**	0.577 (0.135)**	0.140 (0.053)**
vix_{it} $GOV \leq \lambda$	-0.018 (0.007)**	-0.015 (0.006)**	-0.003 (0.003)
vix_{it} $GOV > \lambda$	-0.022 (0.009)**	-0.026 (0.007)**	0.003 (0.003)
Constant	0.093 (0.021)**	0.068 (0.019)**	0.024 (0.007)**
Statistics	N=39 NT=780 R^2 = 0.10 F = 9.64 [0.00]	N=39 NT= 780 R^2 = 0.09 F = 7.36 [0.00]	N=39 NT= 780 R^2 = 0.04 F = 2.38[0.07]

Note1: 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 robust standard errors. * and ** respectively, denote significance at 5 % and 1 % levels. N and NT are, correspondingly, the numbers of countries and the effective number of observations. NT_{TH} reports the number of observations above the estimated threshold level.

$^{++}$ Mean (s.d) reports the mean (standard deviation) of the dependent variable for the observations belonging to the estimated threshold level.

2.2 Trade Openness

The conventional literature following the Heckscher-Ohlin-Mundell framework states that trade integration reduces the incentives for capital to flow capital-scare economies (Antras and Caballero, 2009). In this sense, trade integration and higher capital mobility are substitutes in emerging market and developing economies (EMDE). Antras and Caballero (2009), on the other hand, provides a theoretical model showing that, in the presence of financial frictions, trade integration increases the incentives for capital to flow capital scarce countries and thus trade openness and capital mobility are complements. This, indeed, complementary to the institutional quality explanation by Alfaro et al. (2008), provides another explanation for the

Lucas paradox. In a related context, Davis and van Wincoop (2018) provides a theoretical model and an empirical support for their postulation that higher *de facto* financial globalization increases the correlation between gross capital inflows and outflows, whilst trade openness does the opposite. Cerutti et al. (2017) reports that portfolio bond inflows tend to be more sensitive to global push factors in countries with higher trade openness and more flexible exchange rate regimes.

To analyse whether trade integration (TRADE, sum of exports and imports of goods and services, as a per cent of GDP) is an endogenous structural domestic condition for the main determinants of capital inflows, we consider the following specification:

$$CIF_{it} = b_0 + b_1 vix_t\ (TRADE \leq \lambda) + b_2 vix_t\ (TRADE > \lambda) + b_3 GROWTH_{i,t-1}\ (TRADE \leq \lambda) + b_4 GROWTH_{i,t-1}\ (TRADE > \lambda) + u3_{it} \quad (4)$$

Table 1 presents the results of the estimation of Eq. (4). For aggregate and non-FDI inflows, the threshold level of trade openness is estimated as around 72. According to NT_{TH}, around half of the observations is above the estimated threshold level. For FDI inflows, on the other hand, the estimated threshold is much higher (124.3) with around 15 % of observations belonging to the higher regime. The mean capital inflows is much higher (more than twice) in episodes of higher trade openness for aggregate and non-FDI inflows. A similar, albeit with a similar magnitude, appears to be the case for FDI inflows. For both aggregate and non-FDI inflows, the impact of the domestic pull factor (GROWTH) is substantially much higher for countries with higher trade openness. Worsening global financial conditions tends to significantly decrease aggregate and non-FDI inflows but the impact appears to be invariant to trade openness. FDI inflows, on the other hand, are sensitive to domestic growth in more open economies. Higher trade openness substantially increases the sensitivity of all capital flow types (FDI, non-FDI and aggregate) to domestic growth. Consequently, the complementarity of trade and capital inflows may be interpreted as being the case for the countries having trade openness above the estimated threshold levels.

Table 2. Trade Openness and Capital Inflows			
	Aggregate Capital inflows	Non-FDI inflows	FDI inflows
Threshold TRADE F_B[.]	71.9 18.7[0.03]	72.5 17.1[0.06]	124.3 14.8[0.09]
NT_{TH}	390	388	152
Mean (s.d)$^{++}$ TRADE $\leq \lambda$ TRADE $> \lambda$	 3.08 (4.05) 6.22 (8.11)	 1.25 (3.60) 3.13 (6.79)	 2.31 (2.73) 3.09 (3.75)
The Determinants of Capital Inflows			
$Growth_{i,t-1}$ TRADE $\leq \lambda$	0.110 (0.085)	0.060 (0.080)	0.040 (0.035)
$Growth_{i,t-1}$ TRADE $> \lambda$	0.541 (0.125)**	0.437 (0.110)**	0.228 (0.069)**
vix_{it} TRADE $\leq \lambda$	-0.020 (0.006)**	-0.018 (0.006)**	-0.001 (0.003)
vix_{it} TRADE $> \lambda$	-0.019 (0.008)**	-0.019 (0.007)**	-0.005 (0.004)
Constant	0.094 (0.020)**	0.070 (0.019)**	0.025 (0.007)**
Statistics	N=39 NT=780 R^2 = 0.10 F = 7.17 [0.00]	N=39 NT= 780 R^2 = 0.08 F = 5.63 [0.00]	N=39 NT= 780 R^2 = 0.03 F = 4.03[0.01]

Notes: 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 robust standard errors. * and ** respectively, denote significance at 5 % and 1 % levels. N and NT are, correspondingly, the numbers of countries and the effective number of observations. NT_{TH} reports the number of observations above the estimated threshold level.

$^{++}$Mean (s.d) reports the mean (standard deviation) of the dependent variable for the observations belonging to the estimated threshold level.

2.3 International Financial Integration and Financial Openness

International financial integration and financial/capital openness are often found to be amongst the main determinants of capital flows. There are mainly two widely used measures of financial globalization. The first one is the *de facto* measure proposed by Lane and Milesi-Ferretti (2007, 2018) which uses the sum of gross stocks of foreign assets and liabilities as a ratio to GDP. Following the literature, we use this variable to proxy international financial integration (IFI). The other measure is the *de jure* financial openness measure of Chinn and Ito (2006). 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 is standardized to have a zero mean and unitary variance with higher values denoting more openness to cross-border capital transactions.

Ghosh et al. (2014) finds that EMEs with higher KAOPEN are more likely to experience surges in net capital inflows. In the same vein, Bryne and Fiess (2016) reports that financial openness matters for capital inflows to EMEs. Greater financial openness amplifies countries' exposure to global financial cycle, according to Barrot and Serven (2018). According to Davis and van Wincoop (2018) higher *de facto* financial globalization increases the correlation between gross capital inflows and outflows.

We first consider the *de jure* financial openness measure of Chinn-Ito index (KAOPEN) and estimate:

$$CIF_{it} = b_0 + b_1 vix_t\ (KAOPEN \leq \lambda) + b_2 vix_t\ (KAOPEN > \lambda) + b_3 GROWTH_{i,t-1}\ (KAOPEN \leq \lambda) + b_4 GROWTH_{i,t-1}\ (KAOPEN > \lambda) + u4_{it} \quad (5)$$

Table 3 presents the results. The threshold level of KAOPEN is estimated as 0.82 for all capital inflow types. Considering the fact that, the maximum value of KAOPEN is unity representing the lack of capital account restrictions, the estimated threshold may be interpreted as considerably high. Only around a quarter of the observations are above the estimated threshold level. Consistent with our earlier results, capital inflows tend to be larger in the higher (more financially open) regime. Both the domestic growth and global financial conditions are significant in explaining the aggregate capital inflows. The role of the domestic pull factor is much higher in episodes of less capital account restrictions. A similar picture is observed for non-FDI inflows, albeit domestic growth tends to be significant only in more financially open countries. Consistent with the earlier results for governance and trade openness, FDI inflows are determined basically by GROWTH in more financially open countries.

Table 3. Financial Openness and Capital Inflows			
	Aggregate Capital inflows	Non-FDI inflows	FDI inflows
Threshold KAOPEN F_B[.]	0.82 44.4[0.00]	0.82 31.0[0.00]	0.82 16.6[0.03]
NT_{TH}	199	199	199
Mean (s.d)$^{++}$ KAOPEN $\leq \lambda$ KAOPEN $> \lambda$	 3.89 (5.52) 5.74 (7.76)	 1.78 (4.82) 2.76 (6.32)	 2.11 (2.26) 2.97 (3.70)
The Determinants of Capital Inflows			
$Growth_{i,t-1}$ KAOPEN $\leq \lambda$	0.165 (0.064)**	0.142 (0.060)	0.023 (0.017)
$Growth_{i,t-1}$ KAOPEN $> \lambda$	0.968 (0.106)**	0.729 (0.124)**	0.238 (0.100)**
vix_{it} KAOPEN $\leq \lambda$	-0.017 (0.007)**	-0.017 (0.006)**	-0.001 (0.003)
vix_{it} KAOPEN $> \lambda$	-0.025 (0.007)**	-0.024 (0.008)**	-0.002 (0.003)
Constant	0.090 (0.021)**	0.067 (0.010)**	0.023 (0.007)**
Statistics	N=39 NT=780 R^2 = 0.12 F = 29.7[0.00]	N=39 NT= 780 R^2 = 0.10 F = 11.9 [0.00]	N=39 NT= 780 R^2 = 0.04 F = 1.80[0.15]
Notes: 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 robust standard errors. * and ** respectively, denote significance at 5 % and 1 % levels. N and NT are, correspondingly, the numbers of countries and the effective number of observations. NT_{TH} reports the number of observations above the estimated threshold level. $^{++}$ Mean (s.d) reports the mean (standard deviation) of the dependent variable for the observations belonging to the estimated threshold level.			

We now proceed with considering the *de facto* measure proposed by Lane and Milesi-Ferretti (2007, 2018) which uses the sum of gross stocks of international assets and liabilities as a ratio to GDP to proxy international financial integration (IFI). In this context we estimate:

$$CIF_{it} = b_0 + b_1 vix_t\ (IFI \leq \lambda) + b_2 vix_t\ (IFI > \lambda) + b_3 GROWTH_{i,t-1}\ (IFI \leq \lambda) + b_4 GROWTH_{i,t-1}\ (IFI > \lambda) + u5_{it} \quad (6)$$

According to the results presented by Table 4, the estimated threshold for international financial integration for the aggregate and non-FDI inflows is around 200, which, may indeed be interpreted as very high. The results, however, are essentially the same with those estimated for the *de jure* financial openness measure of Chinn-Ito (KAOPEN). Consistent with the definition of the *de facto* international financial integration measure, the mean capital inflows

are higher for the episodes above the estimated threshold level. The impact of the domestic pull factor on all types of capital inflows is substantially much high in the episodes of the higher threshold regime. The impact of the push factor on both the aggregate and non-FDI inflows is negative as expected and highly significant. The sensitivity of these flows to the global financial conditions appears to be considerably higher in more financially open economies. For FDI inflows, on the other hand, the level of international financial integration appears not to provide a significant threshold. Consistent with our earlier results, FDI inflows are mainly determined by the domestic pull factor (GROWTH).

Table 4. International Financial Integration and Capital Inflows

	Aggregate Capital inflows	Non-FDI inflows	FDI inflows
Threshold IFI F_B[.]	198.8 26.4[0.00]	194.6 27.5[0.00]	190.7 8.22[0.42]
NT_{TH}	93	106	113
Mean (s.d)$^{++}$ IFI $\leq \lambda$ IFI $> \lambda$	 4.30 (5.83) 7.23 (10.3)	 2.07 (5.05) 2.94 (7.78)	 2.23 (2.31) 3.90 (5.22)
The Determinants of Capital Inflows			
$Growth_{i,t-1}$ IFI $\leq \lambda$	0.219 (0.062)**	0.153 (0.053)**	0.052 (0.019)**
$Growth_{i,t-1}$ IFI $> \lambda$	0.875 (0.187)**	0.718 (0.163)**	0.195 (0.100)*
vix_{it} IFI $\leq \lambda$	-0.018 (0.007)**	-0.018 (0.006)**	0.001 (0.002)
vix_{it} IFI $> \lambda$	-0.023 (0.008)**	-0.024 (0.007)**	0.001 (0.003)
Constant	0.092 (0.020)**	0.070 (0.019)**	0.021 (0.007)**
Statistics	N=39 NT=780 R^2 = 0.10 F = 8.46 [0.00]	N=39 NT= 780 R^2 = 0.10 F = 7.53 [0.00]	N=39 NT= 780 R^2 = 0.03 F = 2.58[0.05]

Notes: 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 robust standard errors. * and ** respectively, denote significance at 5 % and 1 % levels. N and NT are, correspondingly, the numbers of countries and the effective number of observations. NT_{TH} reports the number of observations above the estimated threshold level. $^{++}$Mean (s.d) reports the mean (standard deviation) of the dependent variable for the observations belonging to the estimated threshold level.

3. Concluding Remarks

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 dramatic increase in capital flows and financial globalization during the recent decades has led the causes and consequences of capital flows to be increasingly much more topical in international macroeconomics. There is a wide and growing number of studies suggesting that capital flows can, indeed, be explained by a small set of variables including domestic growth (GROWTH) and global financial conditions (GFC) captured by the VIX index correspondingly representing domestic pull and common push factors.

We find that, the mean capital inflows are much higher in EMDE with episodes of better governance/institutional quality, higher trade openness and *de facto* and *de jure* financial openness or international financial integration. Our empirical results from the estimation of endogenous thresholds following Hansen (1999) provide a strong support for the postulation that the impacts of the main pull and push factors may not be invariant to structural domestic conditions such as governance/institutional quality, trade openness, *de facto* international financial integration and *de jure* financial openness. According to our results, these structural conditions, indeed, provide endogenous thresholds for the impacts of the main pull and push factors especially for the aggregate and non-FDI capital inflows in EMDE.

The sensitivity of non-FDI (portfolio equity, portfolio debt and other investment) inflows to GROWTH tends to be substantially much higher in EMDE with better institutional quality and governance, more open to international trade, higher *de jure* capital openness and *de facto* international financial integration. In a similar vein, the impact of the external push factor (GFC) on the evolution of non-FDI inflows appears to be considerably higher in these countries with better governance and higher *de facto* or *de jure* financial openness. Potentially dominated by the non-FDI inflows, similar results are found to the case for the aggregate capital inflows.

The literature often finds that FDI inflows are generally attracted by domestic macroeconomic fundamentals (Rey, 2016 and Eichengreen et al., 2018). Consistent with these results, we find that, FDI inflows are basically determined by GROWTH across all the country specific structural conditions. The impact of the domestic macroeconomic conditions proxied by GROWTH, however, appears to be much higher in EMDE with better governance, higher trade and financial openness. Our results provide also a support for the findings that capital

inflows are pro-cyclical. We, however, find that the degree of pro-cyclicality is much higher in countries with better governance and higher international trade and financial integration.

Our findings suggesting the importance of global financial conditions on capital inflows is in line with the finding suggesting that EMDE "need to closely monitor their lenders and investors to assess their inflow exposures to global push factors" (Cerutti, et al. 2017, p. v). However, our results show that domestic structural conditions represented by better governance and institutional quality, higher trade openness and international financial integration are also important in amplifying the impact of the main domestic pull factor on capital inflows.

REFERENCES

Ahmed, S., & Zlate, A. (2014). Capital flows to emerging market economies: A brave new world? *Journal of International Money and Finance*, 48, 221-248.

Alfaro, L., Kalemli-Ozcan, Ş., & Volosovych, V. (2008). Why doesn't capital flow from rich to poor countries? An empirical investigation. *The Review of Economics and Statistics*, 90(2): 347–368.

Antras, P., & Caballero, R. J. (2009). Trade and capital flows: A financial frictions perspective. *Journal of Political Economy*, 117(4), 701-744.

Avdjiev, S., Hardy, B., Kalemli-Ozcan, S., & Servén, L. (2018). Gross capital flows by banks, corporates and sovereigns. BIS Working Papers 760.

Avdjiev, S., Gambacorta, L., Goldberg, L. S., & Schiaffi, S. (2017). The shifting drivers of global liquidity. NBER Working Paper 23565.

Barrot, L. D., & Serven, L. (2018). Gross capital flows, common factors, and the global financial cycle. World Bank Policy Research Paper 8354.

Boero, G., Mandalinci, Z., & Taylor, M. P. (2019). Modelling portfolio capital flows in a global framework: Multilateral implications of capital controls. *Journal of International Money and Finance*, 90, 142-60.

Bruno, V., & Shin, H. S. (2015). Capital flows and the risk-taking channel of monetary policy. *Journal of Monetary Economics*, 71, 119-132.

Byrne, J. P., & Fiess, N. (2016). International capital flows to emerging markets: National and global determinants. *Journal of International Money and Finance*, 61, 82–100.

Calvo, G. A., Leiderman, L., & Reinhart, C. M. (1993). Capital inflows and real exchange rate appreciation in Latin America: The role of external factors. IMF Staff Papers, 40(1), 108-151.

Calvo, G. A., Leiderman, L. & Reinhart, C. M. (1996). Inflows of capital to developing countries in the 1990s. *Journal of Economic Perspectives*, 10(2), 123–139.

Cerutti, E., Claessens, S., & Puy, M. D. (2017). Push factors and capital flows to emerging markets: Why knowing your lender matters more than fundamentals. Asian Development Bank Economics Working Paper Series 528.

Chinn, M. D., & Ito, H. (2006). What matters for financial development? Capital controls, institutions, and interactions. *Journal of development economics*, 81(1), 163-192.

Davis, S. C., & van Wincoop, E. (2018). Globalization and the increasing correlation between capital inflows and outflows. *Journal of Monetary Economics*, Article in Press, 1-18.

Eichengreen, B., Gupta, P., & Masetti, O. (2018). Are capital flows fickle? Increasingly? And does the answer still depend on type? *Asian Economic Papers*, 17(1), 22-41.

Erdem, F. P., & Özmen, E. (2015). Exchange rate regimes and business cycles: An empirical investigation. *Open Economies Review*, 26, 1041-1058.

Forbes, K. J., & Warnock, F. E. (2012). Capital flow waves: Surges, stops, flight, and retrenchment. *Journal of International Economics*, 88(2), 235-251.

Furceri, D., Guichard, S. & Rusticelli, E. (2012). Episodes of large capital inflows, banking and currency crises and sudden stops. *International Finance*, 15(1), 1-35.

Ghosh, A. R., Qureshi, M. S., Kim, J. I., & Zalduendo, J. (2014). Surges. *Journal of International Economics*, 92(2), 266-285.

Hansen, B. E. (1999). Threshold effects in non-dynamic panels: Estimation, testing, and inference. *Journal of Econometrics*, 93(2), 345-368.

Kaufmann, D., Kraay, A., & Mastruzzi, M., (2005). Governance matters IV: Governance indicators for 1996–2004. World Bank Policy Research Working Paper 3630.

Koepke, R. (2018). What drives capital flows to emerging markets? A survey of the empirical literature. *Journal of Economic Surveys*, 00(0):1-25. https://doi.org/10.1111/joes.12273.

Kose, M. A., Prasad, E.S., & Taylor, A. D. (2011). Thresholds in the process of international financial integration. *Journal of International Money and Finance*, 30: 147–179.

Lane, P. R., & Milesi-Ferretti, G. M. (2007). The external wealth of nations mark II: Revised and extended estimates of foreign assets and liabilities, 1970–2004. *Journal of International Economics*, 73(2), 223-250.

Lane, P. R., & Milesi-Ferretti, G. M. (2018). International financial integration in the aftermath of the global financial crisis. *IMF Economic Review*, 66, 189-222.

Montiel, P. J. (2014). Capital flows: Issues and policies. *Open Economies Review*, 25(3), 595-633.

Obstfeld, M., Ostry, J. D., & Qureshi, M. S. (2018). A tie that binds: Revisiting the trilemma in emerging market economies. Forthcoming, *Review of Economics and Statistics*, https://doi.org/10.1162/REST_a_00740.

Özmen, E., & Taşdemir, F. (2018). Exchange rate regimes as thresholds: The main determinants of capital inflows in emerging market economies. METU ERC Working Paper 18/10.

Passari, E., & Rey, H. (2015). Financial flows and the international monetary system. *The Economic Journal*, 125(584), 675-698.

Rey, H. (2015). Dilemma not trilemma: The global financial cycle and monetary policy independence. NBER Working Paper 21162.

Rey, H. (2016). International channels of transmission of monetary policy and the Mundellian trilemma. *IMF Economic Review*, 64(1), 6-35.

Sarno, L., Tsiakas, I., & Ulloa, B. (2016). What drives international portfolio flows? *Journal of International Money and Finance*, 60, 53-72.

Slesman, L. Y., Baharumshah, A. Z., & Wohar, M. E. (2015). Capital inflows and economic growth: Does the role of institutions matter? *International Journal of Finance and Economics*, 20(3), 253-275.