GROSS CAPITAL INFLOWS AND OUTFLOWS: TWINS OR DISTANT COUSINS?

Erdal Özmen

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

Fatma Taşdemir

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

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

and

Fatma Taşdemir
Middle East Technical University, Department of Economics, Ankara, Turkey
E-mail: tfatma@metu.edu.tr

ABSTRACT

We investigate the long-run relations and equilibrium correction mechanisms between gross capital inflows, outflows and global financial conditions for advanced and emerging market economies. According to our results, the findings of the recent empirical literature, suggesting that twin behaviour of capital inflows and outflows resulting from domestic and foreign investors to behave as distant cousins tend to be the case for the long-run. 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. Consistent with the flight to safety concerns, capital outflows from EME and capital inflows to AE tend to increase in the long-run in response to worsening global financial conditions. We find that, these results essentially hold also for the main components of capital flows.

Keywords: Advanced economies, Cointegration, Emerging market economies, Equilibrium correction, Foreign direct investments, Gross capital flows, Portfolio flows.

JEL Codes: F21, F30, F32, G01

I. INTRODUCTION

International capital flows and global financial conditions are often found as one of the most important determinants of growth (Kose *et al.,* 2012) and business cycles (Erdem and Özmen, 2015) in emerging market (EME) and advanced (AE) economies. The recent studies often find that, monetary policies of financially integrated EME and AE crucially depend on the changes in global financial conditions and interest rates even under flexible exchange rate regimes (Rey, 2015). Consequently, understanding the basic determinants of capital flows has always been a topical research topic in open economy macroeconomics.

There is a wide and growing literature on the determinants of capital flows (see, e.g., Montiel, 2014; Avdjiev, *et al.*, 2017). Gross capital flows, compared to net capital flows, are often found to be much larger and more volatile and thus crucially important for growth and financial stability (Milesi-Ferretti and Tille, 2011; Broner, *et al*., 2013 and Davis and van Wincoop, 2017). 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, 2017). In this sense, capital inflows and outflows are twins.

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, capital inflows and outflows may be expected to be negatively correlated. The recent literature, on the other hand, 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. In the same vein, the results by Avdjiev *et al.,* (2017) "imply that foreign and domestic investors behave differently in response to domestic and global shocks" (p.8), and this is "inconsistent with standard international macroeconomic models, which treat domestic and foreign investors symmetrically" (p.1).

The presence of asymmetric information (Tille and van Wincoop, 2014) or exchange rate risk (Broner *et al*., 2013), both leading to differences in expected returns, are 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 an another 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, Martin, and Ventura (2010). According to Tille and van Wincoop (2010), on the other hand, the portfolio growth component of capital flows can generate positive correlation between capital inflows and outflows when saving rates move together across countries. Davis and van Wincoop (2017) provides a theoretical model and an empirical support for their postulation that higher international financial integration leads to co-movement of capital inflows and outflows. Accordingly, financial globalization causes higher volatility of gross flows relative to net flows and consequently increases the correlation, while trade globalization does the opposite.

This paper investigates the long-run relationships and equilibrium correction mechanisms between gross capital inflows and outflows for a relatively large number of emerging market (EME) and advanced (AE) economies. The co-movement of capital inflows and outflows may also be driven by a common factor such as global financial cycle. Consequently, following the recent literature, including Rey (2016), Forbes and Warnock (2012), Bruno and Shin (2015) and Barrot and Serven (2018), we also consider the role of international financial conditions on the evolution of capital flows. The recent literature, including Blanchard *et al.,* (2017), shows also the importance of the main components of capital flows along with the aggregate gross flows. Consequently, we consider not only aggregate gross flows but also their main components: portfolio (bond and equity), foreign direct investment and other investment (mainly bank intermediated) flows.

The bulk of the literature does not take into account the integration and cointegration properties of the variables in empirically investigating the relationship between capital inflows and outflows and thus may be subject to problems of spurious regression along with estimating equations containing variables with different orders of integration. Such an approach often does not allow to make a distinction between long-run and short-run relations and the adjustment mechanisms towards long-run equilibrium. Furthermore, the literature often employs the conventional panel fixed effects procedure which may be subject to an endogeneity problem under an invalid conditioning about the long-run drivers of capital flows. To tackle these issues, we employ Johansen-Fisher cointegration procedure based on a reparametrized panel vector autoregression model which allows us to estimate the long-run relationships and equilibrium correction mechanisms along with to test the validity of weak exogeneity restrictions.

The plan for the rest of the paper is as follows. Section II presents our empirical results by using annual data for a panel of relatively large number of EME and AE. In Section II.1, we consider the EME sample. Section II.2 presents the results for the AE sample. Finally, Section III concludes.

II. GROSS CAPITAL INFLOWS AND OUTFLOWS: EMPIRICAL RESULTS

We consider gross capital flows for an unbalanced panel of 33 emerging market[1] (EME) and 21 advanced[2] (AE) economies over the annual sample from 1986 to 2015. The choice of the sample is basically determined by data availability[3].
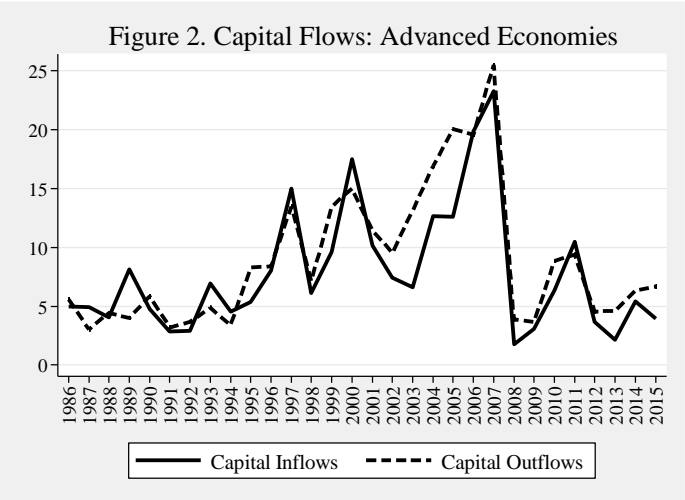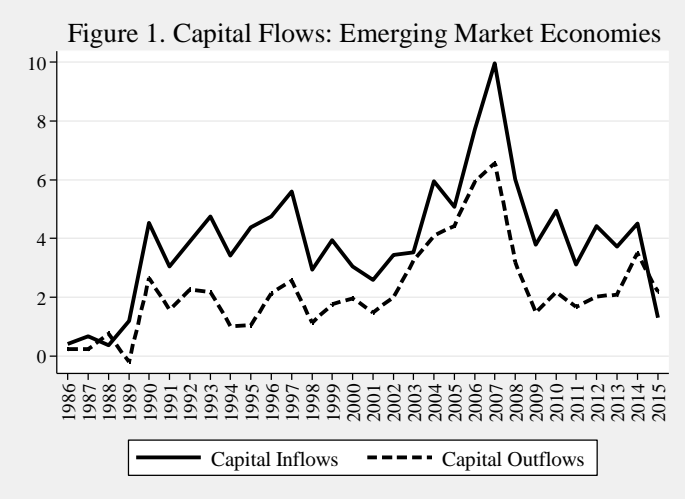
Figures 1 and 2, respectively, present the evolution of aggregate gross capital flows[4] (scaled by GDP in current US dollars) for samples of EME and AE. Both of

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

[2] The AE sample includes Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, UK, USA.

[3] The VIX data are from Chicago Boards Options Exchange website. The VIX data are available only after 1986. Therefore, the estimation sample is 1986-2015.

the figures show a strong co-movement between capital inflows and outflows. The positive correlation appears to be much higher for AE. Net capital inflows (gross capital inflows minus gross capital outflows) is positive for almost the whole sample period for the EME. The absolute magnitude of the net capital inflows (and thus current account imbalances) tends to be much smaller in AE than EME.

Figure 1. Capital Flows: Emerging Market Economies

Figure 2. Capital Flows: Advanced Economies

[4] All the 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 and outflows, respectively, are defined as net purchases of domestic assets by foreign residents and net purchases of foreign assets by domestic residents. The real GDP (current US dollars) data are from World Bank World Development Indicators.

A useful starting point to investigate the long-run relationships between gross capital inflows and outflows is the following benchmark equations:

$$COF_{it} = b_0 + b_1 CIF_{it} + b_2 vix_t + u1_{it} \qquad (1)$$

$$CIF_{it} = a_0 + a_1 COF_{it} + a_2 vix_t + u2_{it} \qquad (2)$$

In the equations, CIF and COF are, respectively, gross capital inflows and outflows scaled by GDP in current US dollars and vix is the log of the Chicago Board Options Exchange's equity option volatility index (VIX). Following Broner *et al*., (2013), we define the equations both for CIF and COF. VIX is often used as a proxy for global liquidity conditions (Gonzales-Rozada and Levy-Yeyati, 2008; Özatay *et al*., 2009) and the state of the financial cycle (Rey, 2015, 2016 and Obstfeld et al., 2017). A decrease in VIX is associated with a greater risk-appetite or better global financial conditions. In accord with the financial cycle postulation, global financial conditions are expected to be amongst the important determinants of international capital flows (Forbes and Warnock, 2012; Bruno and Shin, 2015; Barrot and Serven, 2018).

Table 1 reports the results of Levin, *et al.,* (2002) panel unit root tests for the capital flow variables along with augmented Dickey-Fuller tests for vix_t. The results[5] suggest that all these variables are integrated of order 1 (I(1)). Given that CIF, COF and vix are cointegrated we can define a panel equilibrium correction mechanism (PECM) representation which allows us to assess the adjustment mechanisms to deviations from the long-run equilibrium relationship along with the short-run dynamics. For this, we consider the following reparametrized p^{th} order panel vector autoregression (PVAR(p)) process:

$$\Delta Y_{it} = c_0 + \alpha_1 EC_{it-1} + \Gamma_1 \Delta Y_{it-1} + \ldots + \Gamma_{p-1} \Delta Y_{it-p-1} + u_{it} \qquad (3)$$

where Y is a vector of non-stationary I(1) variables, Δ is the first difference operator and EC (equilibrium correction term) are the stationary deviations from the long-run equilibrium. Johansen (1995) provides a maximum likelihood procedure to estimate and test the cointegrating vectors along with ECM mechanisms for VAR processes.

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[5] The unit root tests for the subsamples of countries yielded essentially the same results and not reported to save the space.

Following Fisher (1932), Maddala and Kim (1998) proposes to combine the p-values of the individual Johansen statistics for each cross-sectional unit to obtain a test statistics for the full panel[6].

Table 1. Unit Root Tests		
	Levels	*First Differences*
Variables	*LLC*	
c_of_{it}	0.16	-21.5**
c_if_{it}	-0.53	-32.3**
p_of_{it}	-0.52	-13.0**
p_if_{it}	0.95	-23.7**
Δfdi_of_{it}	-0.94	-48.4**
Δfdi_if_{it}	-0.05	-47.1**
$\Delta oinv\_of_{it}$	-0.95	-37.4**
$\Delta oinv\_if_{it}$	-0.73	-41.7**
Variable	*ADF*	
vix_t	*-0.37*	*-4.09** *
LLC and ADF are the Levin, *et al.,* (2002) panel unit root and augmented Dickey-Fuller tests, respectively. ** denotes the rejection of the unit root null at the 5% level. The unit root test equations contain also a constant term and the augmentation lag length is chosen as 2 which may be plausible for annual data.		

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[6] In a similar vein, Larsson, Lyhagen and Lothgren (2001) suggests using the average of the Johansen trace statistics. Groen and Kleibergen (2003) shows that the limiting distributions of likelihood ratio (LR) statistics to test for a common cointegrating rank for panels can be represented as a sum of the individual Johansen trace statistics for cross-sections. Örsal and Droge (2014) proposes to standardize the average of the individual LR trace statistics over the cross-sections.

II.1. The Dynamics of Capital Outflows from EME

To estimate the panel ECM (PECM) representation for a PVAR(2) proces for the variable space containing COF, CIF and vix, which allows us to assess adjustment mechanisms to a deviation from the long-run equilibrium relationship along with the short run dynamics, we first consider the following specification:

$$\Delta COF_{it} = c_0 + \alpha_1 EC_{it-1} + \Gamma_1 \Delta COF_{it-1} + \Gamma_2 \Delta CIF_{it-1} + \Gamma_3 \Delta vix_{t-1} + u_{it} \tag{4}$$

In (4), given that COF, CIF and vix are cointegrated, α_1 represents the speed of adjustment to deviations from the long-run relationship[7] EC_{it-1}, where EC is $(COF_{it} - b_1 CIF_{it} - b_2 vix_t)$. VIX proxies global financial conditions (GFC). A decrease in VIX is associated with better GFC.

Table 2 presents the PECM results for capital outflows and their main components for the EME sample. The results of the Johansen-Fisher trace statistics $(\lambda(r))$ strongly suggest the presence of a single cointegration vector for the variable spaces containing capital outflows, inflows and vix at the 1 % level. According to the results by equation (2.1), there is a positive relationship between aggregate capital outflows (c_of) and inflows (c_if) in the long-run. This is consistent with the earlier findings by Broner *et al.*, (2013), suggesting that when foreign capital leaves, residents repatriate their capital generating a retrenchment in net capital flows. An increase in VIX (a decrease in the risk appetite in global financial markets leading to worsening global liquidity conditions) leads to an increase in capital outflows in the long-run. The magnitude of the estimated EC coefficient suggests that the speed of adjustment of capital outflows to deviations from co-integration is relatively fast. During periods of financial turbulence, residents tend to substantially decrease their net purchases of foreign assets in the short-run as suggested by the negative coefficient. The co-movement of aggregate capital outflows and inflows, however,

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[7] Our preliminary analysis suggested that, capital outflows, not the inflows, are often the adjusting variables to deviations from long-run equilibrium relationships for the EME sample. The EC coefficients for the PECM specifications for aggregate, portfolio, FDI and other investment inflows are estimated, respectively, as 0.021(0.020), -0.477(0.043)**, 0.017(0.013), -0.013(0.07), with standard errors in parentheses and ** denote statistical significance at the 1 % level .

appears not to be the case in the short-run for the EME sample. Accordingly, consistent with the conventional wisdom, the behaviours of domestic and foreign residents tend to substantially not diverge from each other in the short-run.

Table 2. The Dynamics of Capital Outflows from EME				
Dependent variable	Δc_of_{it}	Δp_of_{it}	Δfdi_of_{it}	$\Delta oinv\_of_{it}$
Capital flows variable	Aggregate Capital outflows	Portfolio outflows	FDI outflows	Other inv. outflows
Equation	(2.1)	(2.2)	(2.3)	(2.4)
Long-run (EC)				
	c_of_{it}	p_of_{it}	fdi_of_{it}	$oinv\_of_{it}$
if_{it}	0.402 (0.043)**	1.226 (0.099)**	0.287 (0.042)**	-0.100 (0.037)**
vix_t	0.307 (0.096)**	-0.096 (0.055)	0.026 (0.048)	0.386 (0.044)**
Short-run dynamics				
EC_{t-1}	-0.681 (0.046)**	-0.326 (0.035)**	-0.716 (0.034)**	-0.566 (0.040)**
Δof_{it-1}	0.053 (0.041)	-0.269 (0.038)**	0.384 (0.033)**	-0.125 (0.037)**
Δif_{it-1}	-0.083 (0.035)**	-0.234 (0.040)**	-0.093 (0.026)**	0.017 (0.020)
Δvix_{t-1}	-2.736 (0.601)**	-0.503 (0.305)	-0.464 (0.301)*	-0.955 (0.297)**
Statistics	N=33 NT=677 $R^2 = 0.31$ F = 101.7 $\lambda(0) = 187.1^{\dagger\dagger}$ $\lambda(1) = 59.8$ $\lambda(2) = 30.6$	N=33 NT= 644 $R^2 = 0.28$ F = 82.5 $\lambda(0) = 234.4^{\dagger\dagger}$ $\lambda(1) = 67.3$ $\lambda(2) = 42.1$	N=33 NT= 786 $R^2 = 0.37$ F = 153.4 $\lambda(0) = 158.0^{\dagger\dagger}$ $\lambda(1) = 37.4$ $\lambda(2) = 28.9$	N=33 NT= 798 $R^2 = 0.33$ F = 132.5 $\lambda(0) = 162.2^{\dagger\dagger}$ $\lambda(1) = 64.0$ $\lambda(2) = 29.4$
Notes: The values in parentheses are the standard errors. * and **, respectively, denote significance at 5 % and 1 % levels. N and NT are, correspondingly, the numbers of countries and effective number of observations. $\lambda(r)$ are the Johansen-Fisher trace statistics estimated for PVAR(2) process to test the null hypothesis that cointegration rank is at most r and †† denotes the rejection of the corresponding null at the 1 % level.				

The positive long-run relationship between outflows and inflows appears to be the case also for portfolio (eq. 2.2) and FDI (eq. 2.3) flows. For other investment flows, on the other hand, there is a negative relationship (albeit with a relatively low coefficient) between outflows and inflows (eq. 2.4). Better GFC (a decrease in VIX) lead to a decrease in other investment (oinv_of) outflows from EME in the long-run. However, domestic agents tend not to change their net purchases of domestic bonds and equities in the case of a change in GFC as suggested by statistically insignificant

coefficient of vix in Eq. 2.2. Consistent with the findings of the recent literature suggesting that FDI are more stable (Blanchard *et al.*, 2017; Hoggarth *et al.*, 2016; Eichengreen *et al.*, 2018) than the other components of capital flows and largely determined basically by domestic pull factors (Cerutti *et al.*, 2017) the VIX coefficient is found to be statistically insignificant in the long-run equation (2.3).

The main components of capital inflows adjust to deviations from the long-run equilibrium relationships as suggested by the negative and significant equilibrium correction coefficients. An improvement in GFC (a decrease in VIX) leads to an increase in all types of capital outflows from EME also in the short-run and this impact is substantially larger for the other investment outflows. The short-run relationship between capital inflows and outflows tends to be significantly negative for all the main components, except other investment flows. Consequently, consistent with the postulations of conventional international macroeconomic theory, the behaviours of domestic and foreign investors may be interpreted as not to systematically diverge from the other in the short-run. The asymmetry, suggested by the recent empirical literature, on the other hand, appears to the case in the long-run.

II.2. The Dynamics of Capital Inflows to AE

For the advanced economies (AE) sample, we consider the following PECM specification:

$$\Delta CIF_{it} = c_0 + \alpha_1 EC_{it-1} + \Gamma_1 \Delta COF_{it-1} + \Gamma_2 \Delta CIF_{it-1} + \Gamma_3 \Delta vix_{t-1} + u_{it} \qquad (5)$$

where the equilibrium correction term[8] EC is ($CIF_{it} - b_1 COF_{it} - b_2 vix_t$).

Table 3 presents the PECM results. According to the Johansen-Fisher trace statistics ($\lambda(r)$) there is one cointegration relationship between capital inflows, outflows and vix. An increase in outflows leads to an increase in inflows for the aggregate, FDI and other investment but not for the portfolio flows in the long-run. A

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[8] Contrasting with the EME sample, our preliminary analysis suggested that, capital inflows are the equilibrium correcting variables for AE. The EC (adjustment) coefficients for the PECM specifications for aggregate, portfolio, FDI and other investment outflows are estimated, respectively, as 0.231(0.05)**, -0.0009(0.003), -0.466(0.05)** and -0.010(0.081) with standard errors in parentheses and ** denote statistical significance at the 1 % level.

deterioration of global financial conditions leads to an increase in all types of capital inflows to AE except FDI. This may be explained by the capital outflows from EME to AE are mainly driven by quality/safety concerns during turmoil phases of the international financial cycle. Considering also the results for the EME suggesting an increase in capital outflows in response to an increase in VIX, we may interpret that the safe haven flows to AE and risk-on capital outflows from EME are intimately connected. Similar to the EME findings, the evolution of FDI tends to be statistically invariant to GFC in AE in the long-run (Eq. 3.3). As already discussed, this finding is consistent with earlier studies including Blanchard and Acalin (2016), Hoggarth *et al.*, (2016), Cerutti *et al.*, (2017) and Eichengreen *et al.*, (2018). The equilibrium correction estimates all strongly suggests that capital inflows (aggregate and components) adjust to deviations from the long-run equilibrium relationships. The adjustment appears to be very fast (almost within the period) for the aggregate (eq. 3.1) and other investment (eq. 3.4) inflows. Consistent with the postulation that they are much stable, the equilibrium correction tends to be relatively slow for FDI inflows (eq. 3.4).

The long-run "twin" behaviour, however, appears not to be the case in the short-run for aggregate capital (eq. 3.1), FDI (eq. 3.3) and other investment (eq. 3.4) flows. For all these, consistent with the conventional wisdom, the behaviours of residents and non-residents tends not to diverge from each other in the short-run. For portfolio flows, on the other hand, the behaviour of residents tends to be not significantly determined by non-residents (eq. 3.2). For all capital flow types, worsening GFC leads domestic residents to decrease their net purchases of foreign assets in the short-run. Consequently, the flight to safety concern, in the case of a financial turbulence may be interpreted as the case in the long-run for AE.

Table 3. The Dynamics of Capital Inflows to AE				
Dependent variable	Δc_if_{it}	Δp_if_{it}	Δfdi_if_{it}	$\Delta oinv\_if_{it}$
Capital flow variable	Aggregate Capital inflows	Portfolio inflow	FDI inflow	Other inv. Inflow
Equation	(3.1)	(3.2)	(3.3)	(3.4)
Long-run (EC)				
	c_if_{it}	p_if_{it}	fdi_if_{it}	$oinv\_if_{it}$
of_{it}	0.625 (0.033)**	-0.041 (0.062)	0.880 (0.056)**	1.029 (0.046)**
vix_t	0.819 (0.167)**	0.894 (0.123)**	-0.010 (0.116)	0.206 (0.101)**
Short-run dynamics				
EC_{t-1}	-1.194 (0.082)**	-0.539 (0.049)**	-0.220 (0.050)**	-1.132 (0.082)**
Δif_{it-1}	0.131 (0.060)**	-0.129 (0.045)**	-0.452 (0.045)**	0.063 (0.058)
Δof_{it-1}	-0.417 (0.057)**	0.016 (0.029)	-0.131 (0.042)**	-0.588 (0.071)**
Δvix_{t-1}	-8.411 (2.084)**	-0.868 (0.640)	-1.528 (0.788)*	-7.010 (1.822)**
Statistics	N=23 NT=528 $R^2 = 0.46$ F = 150.1 $\lambda(0) = 103.8^{\dagger\dagger}$ $\lambda(1) = 44.2$ $\lambda(2) = 20.3$	N=23 NT= 522 $R^2 = 0.32$ F = 80.1 $\lambda(0) = 99.7^{\dagger\dagger}$ $\lambda(1) = 46.6$ $\lambda(2) = 18.7$	N=23 NT= 532 $R^2 = 0.36$ F = 100.5 $\lambda(0) = 102.5^{\dagger\dagger}$ $\lambda(1) = 37.2$ $\lambda(2) = 19.7$	N=23 NT= 551 $R^2 = 0.43$ F = 136.9 $\lambda(0) = 114.6^{\dagger\dagger}$ $\lambda(1) = 51.3$ $\lambda(2) = 24.1$

Notes: The values in parentheses are the standard errors. * and **, respectively, denote significance at 5 % and 1 % levels. N and NT are, correspondingly, the numbers of countries and effective number of observations. $\lambda(r)$ are the Johansen-Fisher trace statistics estimated for PVAR(2) process to test the null hypothesis that cointegration rank is at most r and †† denotes the rejection of the corresponding null at the 1 % level.

III.   CONCLUDING NOTES

The perfect international financial markets postulation of conventional wisdom suggests that portfolio choices of residents and non-residents do not systematically diverge from each other especially in the long-run. Consequently, such "twin" behaviours of economic agents are expected to lead capital inflows (net purchases of domestic assets by non-residents) and outflows (net purchases of foreign assets by residents) to be negatively correlated and thus may be interpreted as "distant cousins". The recent empirical literature, on the other hand, finds that residents and non-residents behave, indeed, as distant cousins leading capital inflows and outflows to behave as twins. The results of this paper, however, strongly suggest that all these relationships may be different in the long-run than in the short-run.

This paper argues that the integration and cointegration properties of the variables of interest along with the dynamic adjustment mechanisms towards long-run equilibrium should be taken into account in investigating the relationships between capital inflows and outflows. Consequently, the evidence based basically on a panel fixed effect procedures between variables with different orders of integration may better be interpreted with a caution. Our results strongly suggest that, not only the aggregate capital flows but also their main components may behave different in the short-run than in the long-run.

The long-run evolution and the adjustment mechanisms to deviations from the long-run equilibrium relationships are tended to be driven by the behaviours of residents for the EME sample and non-residents for the AE sample. For the EME sample, the equilibrium correction variable is estimated as capital outflows, that is net purchases of foreign assets by residents. The net purchases of domestic assets by foreign residents (capital inflows), on the other hand, adjust to achieve equilibrium for the AE sample.

Consistent with the findings of the recent empirical literature, we find that there is a strong co-movement between capital inflows and outflows in the long-run[9]. The only exceptions are the other investment flows for the EME sample and portfolio flows for the AE sample. The long-run equilibrium relationships are consistent with the expansion (retrenchment) of financial globalisation (sum of country's international assets and liabilities) during the tranquil (turmoil) periods of global financial conditions (Milesi-Ferretti and Tille, 2011; Forbes and Warnock, 2012; Broner *et al.*, 2013; Rey, 2016).

Contrasting with the long-run evidence, the short-run relations between capital inflows and outflows appear to be significantly negative or insignificant for all the components of capital flows both in AE and EME. Consequently, supporting the conventional wisdom, the "distant cousin" behaviours of residents and non-residents leading to this "twin" behaviours of capital inflows and outflows, may be interpreted as not to be the case in the short-run.

The state of the global financial cycle proxied by the VIX is found to be an important determinant of capital flows both in EME and AE. A turbulence in international financial markets leads to an increase in capital outflows from EME in the long-run. Consistent to flight to safety concerns, capital inflows to AE increases under such conditions. The short-run behaviours, however, often are not the same. In response to worsening global financial conditions, we observe increases in net purchases of foreign assets (domestic assets) by residents (non-residents) in EME (AE). This is consistent with a stylised fact that, both capital inflows and outflows decrease leading to retrenchment in the case of a global financial turbulence such as the recent global financial crisis.

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[9] Our findings suggesting that gross capital inflows and outflows move in tandem and this is stronger for AE is in line with the panel bivariate results of Broner *et al.*, (2013). Broner *et al.*, (2013, footnote 11) notes that, their results are robust to inclusion of control variables such as the VIX. The results of this study suggest that this co-movement is, often, the case for the long-run.

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