

Importance of Foreign Ownership and Staggered Adjustment of Capital Outflows

November 2015


Özgür ÖZEL
M. Utku ÖZMEN
Erdal YILMAZ

© Central Bank of the Republic of Turkey 2015

Address:
Central Bank of the Republic of Turkey
Head Office
Research and Monetary Policy Department
İstiklal Caddesi No: 10
Ulus, 06100 Ankara, Turkey

Phone:
+90 312 507 54 02

Facsimile:
+90 312 507 57 33



The views expressed in this working paper are those of the author(s) and do not necessarily represent the official views of the Central Bank of the Republic of Turkey. The Working Paper Series are externally refereed. The refereeing process is managed by the Research and Monetary Policy Department.

Importance of Foreign Ownership and Staggered Adjustment of Capital Outflows

Özgür ÖZEL*, M. Utku ÖZMEN* and Erdal YILMAZ**+

Central Bank of the Republic of Turkey

Abstract

Global financial markets have experienced a liquidity glut since the beginning of the new millennium especially in the aftermath of the 2008-2009 global financial crisis. In this era, the flow of foreign funds to emerging markets have elevated, somewhat more to Turkey. This flow increased foreign investor holdings in emerging markets. This study puts forward the increased share of foreign investors as a potential stabilizer for local financial markets, because domestic investors' weak absorption capacity may create liquidity constraints acting as an obstacle for foreign outflows. In order to pin down the effect of foreign investor dominance, we present empirical evidence from a detailed stock-ownership data. The detailed micro level data not only helps us unveil the behavior of foreign investors, but also helps us to discuss macroeconomic implications of their micro level decisions. In addition, given that the foreigner's recent share in Turkish equity market is considerably high both from an historical viewpoint and from a cross section comparison with other emerging markets, the conclusions we reach regarding the market stabilization effect of foreigner share are unique. Overall, in an emerging market with high foreign ownership and low domestic absorption capacity at play, capital outflows might be staggered, rather than sudden.

JEL codes: C58, E44, F32, G11

Keywords: *capital outflows, staggered adjustment, liquidity constraint, absorption capacity, foreigner effect*

* **ÖZEL:** Economist, Research and Monetary Policy Dept. E-mail: ozgur.ozel@tcmb.gov.tr

* **ÖZMEN:** Economist, Research and Monetary Policy Dept. E-mail: utku.ozmen@tcmb.gov.tr

* **YILMAZ:** Economist, Research and Monetary Policy Dept. E-mail: erdal.yilmaz@tcmb.gov.tr

+Corresponding author. Address: Central Bank of the Republic of Turkey (CBRT), Research and Monetary Policy Department, İstiklal Caddesi, No: 10, 06100-Ulus, Ankara, Turkey.

Authors thank Yavuz Arslan for providing the data. Authors also thank Özge Akıncı, Tolga Tiryaki, seminar participants at the CBRT Research and Monetary Policy Department, the editor and the anonymous referee for valuable comments and suggestions. The views and opinions presented in this study belong to the authors and do not necessarily represent those of the Central Bank of the Republic of Turkey or its staff.

1. Introduction

In the last decade, important factors such as search for yield, accelerating financial innovation and inflating central bank balance sheets have motivated investors in advanced countries to increase their asset positions in emerging economies. Undeniably, the structural reform agenda of the emerging markets (EM) has also been a supportive pull factor until recently. The phenomenon of voluminous capital inflow to emerging markets has received attention from different branches of the literature. On the macro level, international economics and finance literature has mainly focused on determinants of flows in terms of pull and push factors, sudden stops and impact of capital flows on macro variables. On the micro level, micro finance literature focused on investor behavior in terms of investor types and their relationship with such concepts as market return, volatility, liquidity, etc. Overall, concerning fund flows, the macro perspective lacks micro structure as it focuses on aggregated data. Meanwhile, the micro perspective fails to identify macro implications. In this environment, this study aims to establish the link between micro and macro perspectives by studying the implications of micro market structure on the aggregate capital flows.

Specifically, this study is the first attempt, to our best knowledge, to answer the question of whether the share of foreign ownership in stock market affects capital flows to financial markets. In a corollary, the paper analyzes whether the high share of foreign ownership prevents/alleviates a sudden adjustment of capital outflows. The mechanism argued in this paper is as follows: Consider a market where foreign investors are considerably outnumbered by domestic investors, yet total portfolio size of foreigners is comparatively high. In case of a capital outflow, first "absorption capacity" kicks in: A small relative reduction in the portfolio of foreigners will require a much higher increase in the portfolio of domestic investors, and after a certain point the capacity of domestics may not absorb the entire supply. Afterwards, the "price effect" follows: Due to the weak absorption capacity and liquidity constraint, price may go down dramatically and thus the value of foreigners' portfolio reduces considerably and this leads to

"staggered adjustment", where foreigners exit in an extended time period due to both low liquidity and high liquidity premium. Thus, the macro implication of such a market structure is the staggered adjustment of capital outflows, rather than sudden movements in capital outflows.

Our results first show that the price effect in response to foreign capital movements is much higher for shares which are already foreign-dominant. Second, at distressed times accompanied by outflow pressure, the lowering prices invigorated by foreigner effect induces new foreign investors to bring in capital. However, the incoming inflows do not compensate the entire outflow. Third, we provide evidence for conditional herding during market turbulence times as the liquidity premium born by foreigners is much higher during such periods.

Thus, the contribution of this paper is providing micro-evidence from the Turkish stock market that capital outflows from emerging market countries with predominant foreigner presence would not be as "sudden" as in the past, but pose a "staggered adjustment pattern". However, the paper does not focus on ex-ante reasons for capital inflows, or cross-sectional variation of foreign ownership of specific stocks, but rather on the outflow pattern given high foreign ownership. Furthermore, the viewpoint presented is novel in that it is the first paper to voice the relationship between heightened foreign ownership ratio and market stability. In a recent study by Cerutti et al. (2015), market characteristics are put forward as determinants of capital flows in addition to pull and push factors. In this perspective, our results suggest that heightened foreign ownership ratio needs to be appended to the list of important market characteristics.

The richness of the data and the nature of the Turkish equity market provide an excellent laboratory to test the validity of our claims. The detailed micro level investor data not only helps us unveil the behavior of foreign investors, but also enables us to discuss macroeconomic implications of such micro level decisions. In addition, given that the foreigner's share in Turkish equity market is considerably high in the sample period (both from historical perspective and in terms of cross section comparison with other EMs), the conclusions we reach

about the market stabilization effect of foreign investor concentration are unique in that sense as well. The results might be generalized to all emerging markets to the extent of foreign investor dominance in the specific market at hand.

The rest of the paper is organized as follows: The following section reviews the related literature and the next one presents the data in a detailed fashion in order to shed light on stylized facts about the ownership structure of the Borsa Istanbul (BIST) equity market. Fourth section of the paper presents the empirical results and the last section concludes the study.

2. Overview of Related Literature

In the international macro literature, considerable efforts have been devoted to uncovering important push and pull factors for overall fund flows into emerging economies. In fact, the seminal paper of Calvo et al. (1993) coined the terms “pull” and “push” factors to represent the domestic and foreign, or better global, determinants of fund flows to emerging economies. The literature on identification of push and pull factors is considerably rich. Broadly speaking; push factors such as global liquidity and risk appetite; pull factors such as inflation, growth rate, interest rate differentials, country risk and institutional quality are found to be important determinants of capital flows to emerging markets. Overall in this strand of literature, push factors are found to be more prevalent compared to pull factors.

Moreover, recent studies on this strand of literature establish the time-varying nature of the effect of specific determinants of capital flows. Fratzscher (2012), verifying the relative importance of push factors to dominate in the whole sample used, however, shows that pull factors have in some periods (for instance between 2009-2010) heightened explanatory power to account for capital flows into emerging markets. The study by Duca (2012) is another recent example for time-varying analysis of the drivers of foreign portfolio equity flows. Erduman and Kaya (2014) estimate a time-varying regression model to identify the determinants of emerging market bond flows and put forward global liquidity and interest rate differentials as the most important push and pull factors, respectively.

This literature, unlike our paper, focuses on determinants of capital inflows, rather than outflows. However, it is an important complementary analysis for us in that it sheds light on macroeconomic rationale why entry to some emerging markets might be considerably higher than others.

A variant of this strand of literature focuses on various transmission channels of global and domestic factors on financial markets, e.g. Forbes and Rigobon (2002) and Bekaert et al. (2005). This strand links to contagion literature as defined by the transmission and exacerbation of shocks through inter-related (through trade, geography, financial links etc.) international and domestic markets. Examples in this realm include Claessens and Forbes (2001) and Bekaert et al. (2014).

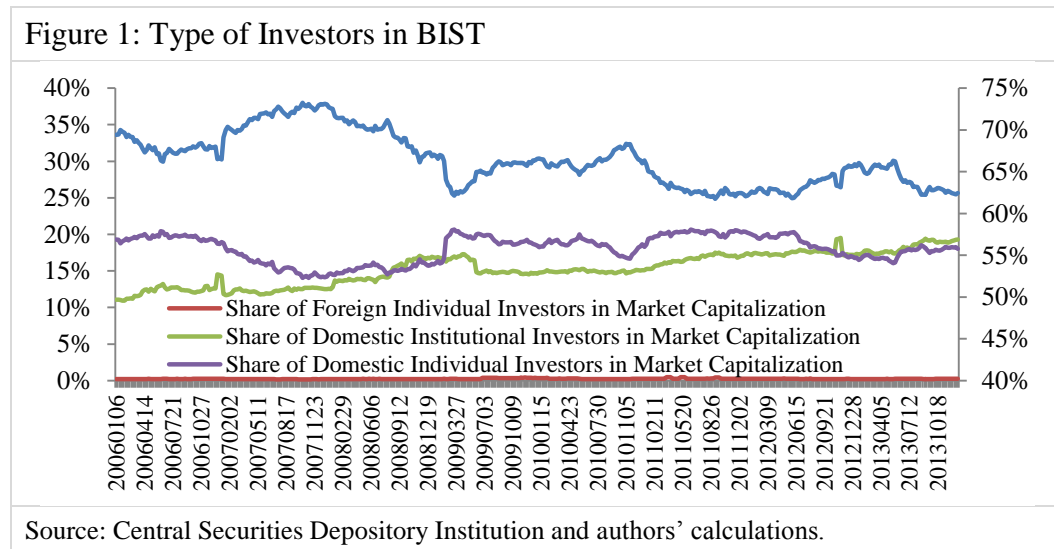
Another front in the international macro literature is on extreme capital movements. Calvo (1998) establishes the link between emerging market crises and sudden stops defined as large and mostly unexpected capital account contractions observed in periods of systemic turmoil. Calvo et al. (2008) estimate the probability of sudden stops as a function of macroeconomic imbalances arising in real exchange rate and excessive liability dollarization. Forbes and Warnock (2012) generalize the subject of extreme capital movements to include flights and retrenchments in order to see a broader picture including domestic investor behavior, as well. They find significant counter-movements of domestic investors vis-à-vis foreign investors resulting in lower volatility in financial markets of a sample of 58 countries over the 1980-2009 period. Our paper can be classified as an extension of this literature because we claim that the Turkish equity market, with considerable foreigner representation has a novel-stated trait of staggered capital adjustments rather than sudden stops. Moreover, we improve the analysis by focusing on micro investor behavior.

On the micro perspective, on the other hand, analyses of voluminous capital inflows have been studied on the domain of individual investors' portfolio allocation decisions. This literature is not particularly rich, especially because of the lack of detailed data on international fund allocation on investor basis. Raddatz and Schmuckler (2012) have managed to decompose the change in

emerging market funds' allocation weights into two, as emanating from fund manager and fund investor decisions. Furthermore, they concluded that asset allocation decisions were procyclical, i.e. a period of less favorable returns is more likely to precede fund outflows. Calvet et al. (2009); Froot and Ramadorai (2005) are other important studies focusing on individual or fund level asset allocation decision.

3. Data and Stylized Facts

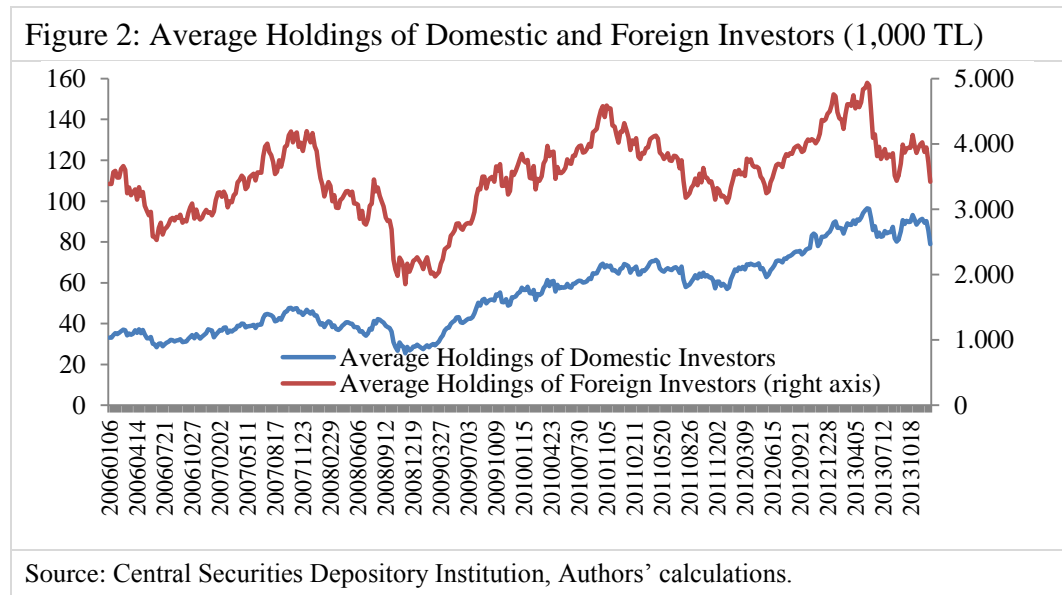
The main data set spans the January 2006 - December 2013 period on a weekly basis in terms of the decomposition of foreign and domestic individual and institutional investors. The source of the data is Central Securities Depository Institution, the authority keeping records of each investor's position in Turkish stock market BIST (Borsa Istanbul). The data includes weekly stock holdings (positions) of those investors, whose total equity portfolio value exceeds 50,000 Turkish lira (around 25,000 USD at the data period). Overall, the data includes weekly information about roughly 400 shares on individual investor basis. Such a detailed micro data set enables us to compute the share of investors in each security traded in BIST in four possible categories, namely in domestic/foreign and individual/institutional breakdown on a weekly basis. Figure 1 displays the dominance of foreign institutional investors in BIST.



A closer investigation of the data reveals that foreigners tend to hold shares with relatively larger market cap. The majority of both foreign and domestic investors are institutional investors. However, the total holdings of domestic individual investors are close to that of domestic institutional investors, whereas foreign individual investors are almost non-existent.¹

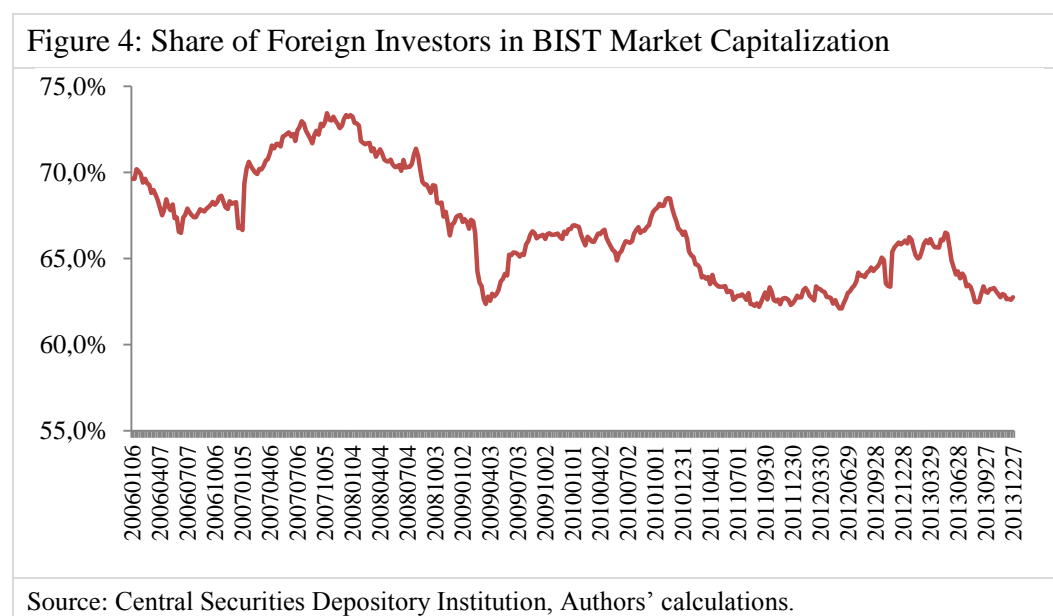
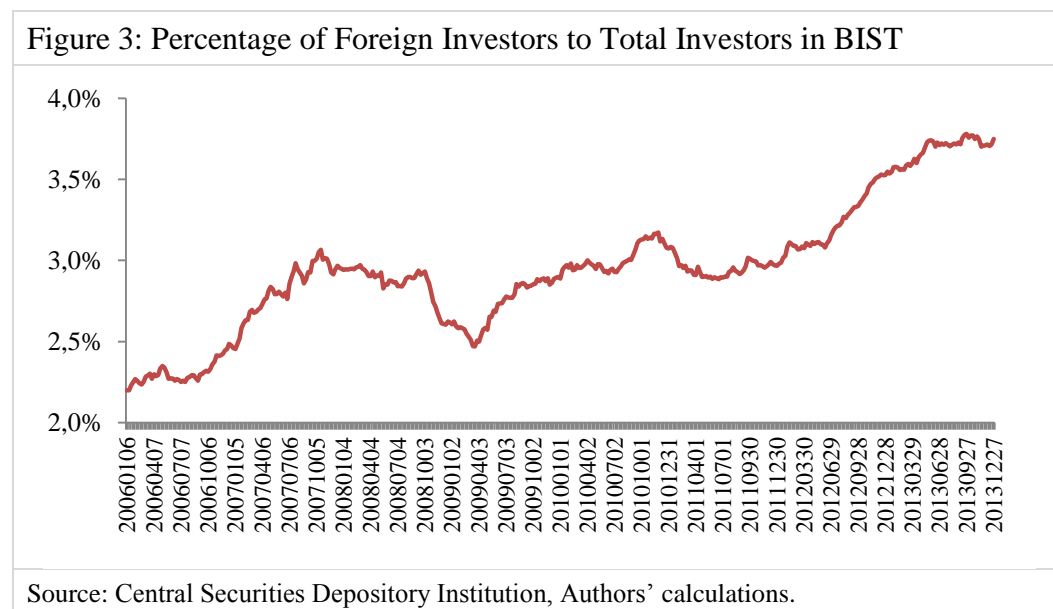
The data set classifies investors on residency basis. That is why there is no way to distinguish domestic investors that might be trading via accounts in abroad. Yet, BIST gains are exempt of withholding tax for both resident and nonresident investors. So we believe that there is not much incentive for domestic investors to trade via a nonresident company. Consequently, we assume all nonresident investors to be foreign.

A very important feature of the data is the disparity between the average holding per stock of foreign and domestic investors, as shown in Figure 2. A foreign investor holds, on average 44 times as large a portfolio as a domestic investor. This wedge is much more pronounced, if we concentrate only on shares, where foreigners have strictly positive investment.



¹ 50,000 TL lower-bound seems not to be exclusive for individual investors, when we compare the total free float market cap of BIST to the sum of total portfolio value of investor subcategories. In other words, we can conclude that the vast majority of individual investors, foreign or domestic, are holding a portfolio exceeding 50,000 TL.

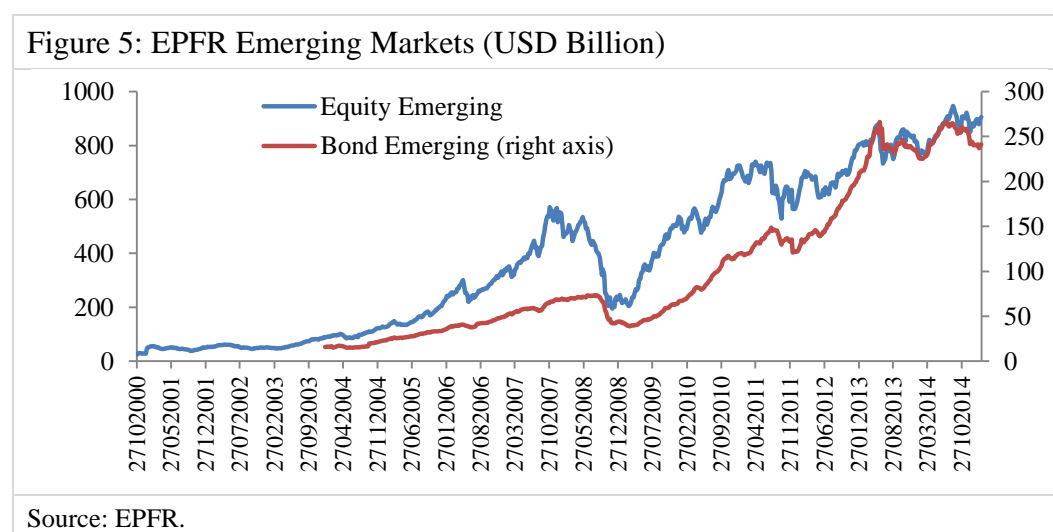
Actually, foreign investors are vastly outnumbered by domestic investors. Figure 3 reveals that of all BIST investors, foreigners comprise only 3.8 percent. Yet, as it is evident in Figure 4, foreign investors hold around two thirds of BIST total free float market capitalization.



When both Figure 3 and 4 are evaluated together, we conclude that during the time span of the data period the new-entering foreign investors have on average a smaller allocation to Turkey, because as the number of foreign investors are

increasing, the share of foreign holdings are diminishing indicating that some larger players are leaving the market or decreasing their exposure, whereas smaller foreign players are entering.

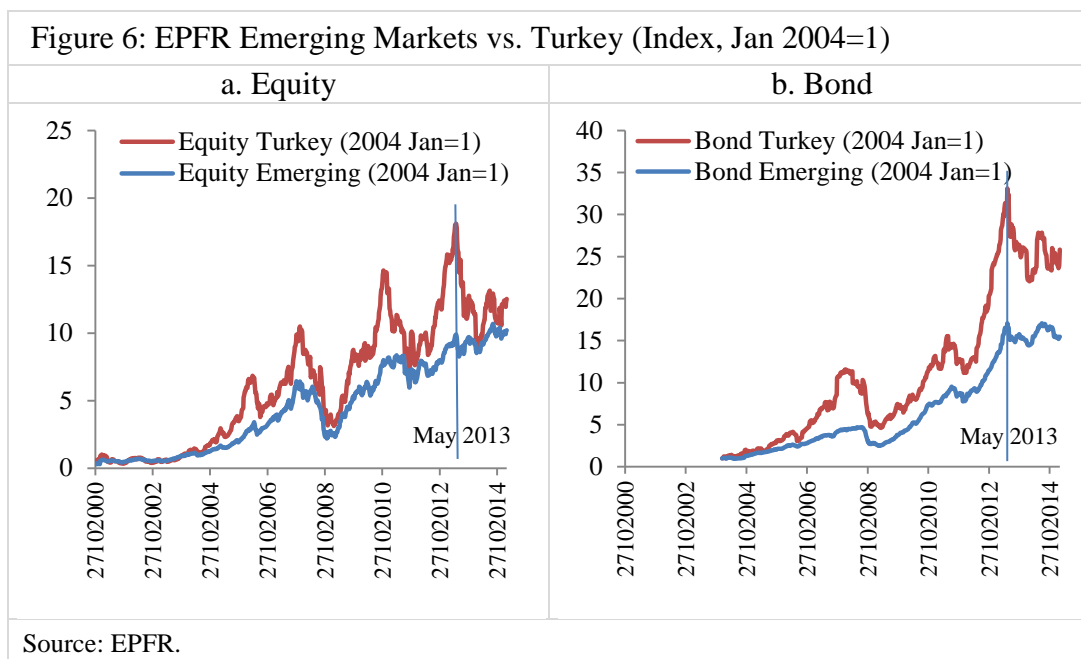
Besides, we use Emerging Portfolio Fund Research (EPFR) data to provide the big picture on portfolio flows to emerging market countries. Although EPFR data covers 5 to 20 percent of the total market capitalization in bond or equity markets for most countries, Jotikasthira et al. (2009) showed that EPFR data is fairly representative to account for total portfolio flow trends. Based on this, foreign portfolio flows to emerging equity markets have increased exponentially since 2004 (Figure 5). Our EPFR domestic currency denominated bond data, having a more recent starting date, displays a similar rapid increase in foreign investor holdings.



Turkey has experienced somewhat stronger inflows into equity market, but considerably stronger inflows into its bond market compared to other emerging markets until May 2013 “taper-tantrum” (Figure 6). Thereafter, Turkey faced weaker capital inflows compared to other EM countries.² This observation is in

² The EPFR data includes stock market returns, currency appreciation/depreciation or changes in bond prices due to nominal interest rate fluctuations. However, for robustness check we have used Turkish Balance of Payments (BOP) statistics, which are adjusted for currency and asset returns. BOP statistics reveal that during the period of analysis cumulative equity and bond portfolio inflows have never fallen below zero. Similarly, when we deflate EPFR equity and bond holdings, we still verify slowing portfolio inflows to Turkey in post May-2013 period.

line with the findings of Cerutti et al. (2015) as emerging countries may respond to push factors heterogeneously.



Another salient feature of the Turkish equity market is the low size of free float market cap compared to its peers even corrected for the size of GDP. For instance, in 2012 Turkish stock market comprised 0.58 percent of total global free float market cap, whereas Brazil equity market, Brazil being thrice as big as Turkey in terms of GDP, comprised 2.37 percent. This might be one reason why foreigners' share in Turkish stock market is high compared to its peers. The asset allocation decision of foreign investors with the same absolute value of intended investment would result in higher share of foreigner holding in BIST due to its smaller free float market cap.

Foreign investors representing only around 3% of total BIST investor base hold around 62-70% of total equity value over the whole sample period. According to Ülkü (2015), the same ratio is around 50% for Hungary and Czech Republic, whereas it is around 25–35% in Asian markets. In this respect, Turkey has a relatively higher foreign representation compared to its peers.

Furthermore, foreign investors hold a higher proportion of the shares in leading stocks. For instance, in the last week of our data, while the overall foreign

ownership is 63%, the foreign ownership in the top-10 shares in terms of free float market cap is 73% on average. For these shares, the ratio of transaction volume to free float market cap is higher compared to others. This suggests that foreign investors do their best to overcome the liquidity constraint by investing in relatively more liquid shares. Yet, although individual foreign investors acquire more liquid shares, on the aggregate level their strong presence poses an externality for others in terms of liquidity constraint especially at distressed times.

A valid question would be whether foreign investors have over-invested into the Turkish equity market by disregarding the complications that might arise due to high overall foreign ownership. This might be the case as the liquidity constraint arising due to this channel has not been voiced before. Another important point leading to high foreign ownership might be Turkey's strong growth path, especially until the end of 2011 and the current strong growth potential compared to other EM countries. This relative attractiveness might have led foreign investors to heavily buy Turkish shares. Furthermore, since Turkish free float market cap to the GDP ratio is lower compared to its peers, the same amount of inflow would result in higher foreign investor share in terms of market cap.

4. Empirical Analysis and Results

Our arguments suggest that strong foreign investor presence is associated with liquidity constraints. Unfortunately, there is no direct way to observe the liquidity constraint because we do not have data on foreign investors' unfulfilled sell orders at market price. Realized transaction volume is not enough to gauge the degree of the liquidity constraint. For long-term investors liquidity is less of a concern. On the other hand, there is a coordination problem for more frequently optimizing investors: Liquidity might be ample on individual basis, but arises as an important bottleneck in case of herding accompanied by low transaction volume during distressed times.

Although foreign investors prefer shares with relatively high liquidity, it is unlikely for comparatively small-sized domestic investors to serve as a deep-pocket counter-party to cover the supply in case foreign investors post massive

sell orders.³ We claim that, this phenomenon of inadequate absorption capacity of domestic investors leads foreign investors to sell in a longer time-span than dictated by their otherwise optimal portfolio allocation decision because the selling pressure coupled with low liquidity results in considerable discounts, where at some point selling might become non-optimal.⁴ In order to analyze the claimed price effect, consider the following specification:

$$\Delta P_stock_{i,t} = c + \alpha \Delta ForSh_{i,t} + \beta \Delta ForSh_{i,t} * D(ForMaj)_{i,t} + X_t' \beta + f_i + \varepsilon_{i,t} \quad (1)$$

where, $\Delta P_stock_{i,t}$ is the return of stock i at period t ; $\Delta ForSh_{i,t}$ is the change in the foreign ownership ratio of stock i at period t . $D(ForMaj)_{i,t}$ is a dummy variable taking the value of 1 if foreigner share is greater than 50% for share i at time t . Here, α represents the foreign price effect in domestic majority shares and $\alpha + \beta$ is the foreign price effect observed in foreign majority shares. Meanwhile, X is a vector of control variables including domestic monetary policy shock⁵, the percentage changes in JP Morgan MSCI Index and VIX Index. f_i shows stock specific fixed effects and $\varepsilon_{i,t}$ is the error term. An increase in the monetary policy variable is associated with a tighter monetary policy, which is deemed contractionary for economic activity. Given the presence of stock-specific factors, the model is estimated with fixed-effects panel data regression methods. Obviously, some shares might be both foreign and domestic-dominant throughout the sample period. The salient features of data used for regression analysis are presented in the following table:

³ Furthermore, anecdotal evidence suggests that foreign investors' voluminous selling is a strong bearish signal for domestic investors, so that they are less likely to buy in large quantities when foreigners are scaling down their portfolio.

⁴ Alternatively, foreign investors are not able to short in the futures market, or buy put options because similar liquidity problems arise during turbulent times.

⁵ The domestic monetary policy shock is received from Kılınç and Tunç (2014) study, where the authors extract the monetary policy shock through a SVAR model for Turkey. We are thankful to the authors for sharing the data to be used in our analysis.

Table 1: Descriptive Statistics

Variables	Obs	Mean	Std. dev.	Min	Max
Share price (Percent Change)	33765	0.10	13.27	-98.93	99.55
Foreign share (Difference)	33765	-0.04	2.73	-72.91	83.08
MSCI_Emerg (Difference)	33765	2.26	56.68	-246.15	147.14
VIX (Difference)	33765	0.01	4.87	-10.23	30.94
Monetary policy shock	31183	0.00	0.56	-1.42	2.23

The strong price effect of foreign investor behavior is evident in Table 2. The table consists of five columns. The regression in the first column shows the impact of the change in foreign share and the interaction of the change foreign share with foreign majority dummy variable on stock return. The second column controls for global risk appetite (represented by the VIX Index), emerging market stock market performance (measured in terms of JP Morgan MSCI Index), and domestic monetary policy shocks. The third column further includes a linear time trend. The last two columns include stock per year fixed effects in order to account for slow moving changes in stock-specific characteristics.

Table 2: Responsiveness of Stock Prices to Changes in Foreign Ownership Ratio
Dependent variable: Percent change in share prices

Variables:	(1)	(2)	(3)	(4)	(5)
D(Foreign share)	0.49*** (0.07)	0.50*** (0.07)	0.50*** (0.07)	0.48*** (0.07)	0.48*** (0.07)
D(Foreign share) *Foreign Majority	0.37** (0.15)	0.29** (0.13)	0.29** (0.13)	0.23* (0.13)	0.24* (0.13)
D.MSCI_Emerg		0.06*** (0.00)	0.06*** (0.00)	0.05*** (0.00)	0.05*** (0.00)
D.VIX		-0.44*** (0.02)	-0.41*** (0.02)	-0.43*** (0.02)	-0.42*** (0.02)
Monetary policy shock		-0.24* (0.13)	-0.22* (0.13)	-0.83*** (0.14)	-0.59*** (0.14)
Time trend			0.03*** (0.00)		-0.23*** (0.02)
Stock*Year fixed effects	0.49*** No	0.50*** No	0.50*** No	0.48*** Yes	0.48*** Yes
Constant	0.11*** (0.01)	0.12*** (0.01)	-1.42*** (0.13)	-2.48*** (0.03)	-0.80*** (0.18)
Observations	33,765	31,183	31,183	31,183	31,183
R-squared	0.016	0.172	0.175	0.266	0.269

Robust standard errors in parentheses. All specifications report fixed effects panel regressions. Sample period is January 2006-December 2013. *** p<0.01, ** p<0.05, * p<0.1

Depending on the econometric specification, the foreigner effect (the impact of 1% increase in foreign ownership on the return) in domestic-majority shares lies around 0.50 (α) percentage points. Meanwhile, the foreigner effect is significantly higher for foreign-majority shares ranging between 0.71 and 0.86 ($\alpha + \beta$). Negative monetary policy shocks and increases in the VIX index are associated with negative returns, and Turkish equities move in tandem with other emerging market stock indices. All control variables have the expected sign. Furthermore, in all specifications the coefficients for VIX and MSCI are statistically significant and stable. On the other hand, the impact of monetary policy shock is amplified when stock per year fixed effects are introduced.

A rich set of control variables would have been included in the analysis in tandem with the ones already used. As is well-known and thoroughly analyzed in the literature for various countries and sample periods; P/E ratio, degree of market capitalization, book-to-market ratio, company size etc. are important determinants of stock returns. In a recent study for Turkey, Eraslan (2013) tests the validity of the Fama and French three-factor asset pricing model on BIST by using monthly excess stock returns over the period from 2003 to 2010. In terms of realized returns large firms and low book-to-market ratio companies perform better than the others during the sample period. Based on the literature, we could have included other controls on top of macroeconomic common factors already used (MSCI, VIX and monetary policy shocks). However, fixed effects estimation does the desired job to capture stock specific determinants that are not changing within time. Furthermore, we have included “stock per year fixed effects” in order to control for slow moving stock-specific characteristics.

The coefficients on the “foreigner effect” reveal that unconditionally, i.e. in the absence of a particular impactful event, foreigners have to assume a high liquidity premium both in entry and the exit. More precisely, in case foreigners increase their weight by 1% in a share where they are already the major owner, they drive up the price by around 0.8 percentage points, whereas the liquidity premium born by foreigners is around 0.5 percentage points, if domestic investors are the major

owners. The same price effect is present in the case of exit, so that foreigners drive prices down when they exit the market. The relatively high and statistically significant liquidity premium associated with the strong presence of foreign investors acts as an important stabilizer for the BIST, in that foreigner investors incur higher costs while entering and exiting the market so that swift portfolio adjustments become less likely.

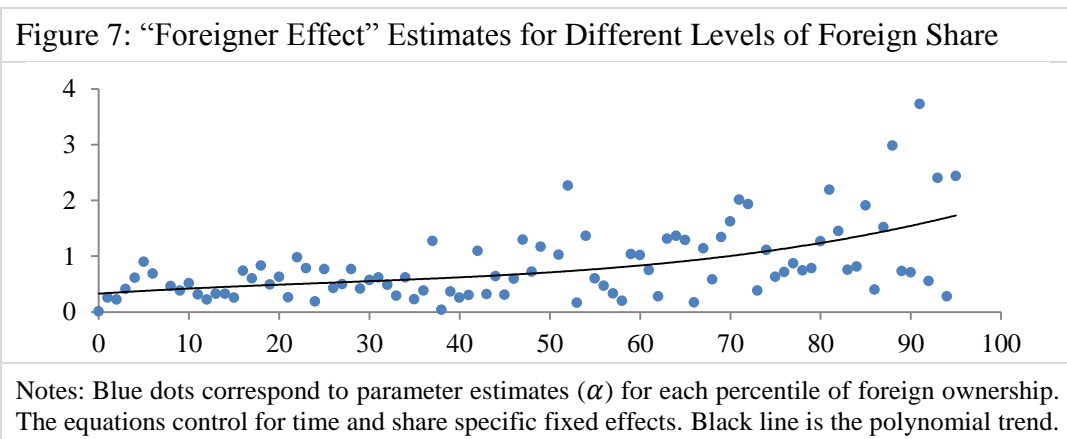
Although our results are fairly robust for the change in foreign investors' share on stock prices, one may consider to what extent foreign capital flows depend on past returns. A recent work by Ülkü and İvizlerli (2015) employing a structural VAR analysis reports both the cumulative impulse response of net flows to a shock in local returns and the cumulative impulse response of local returns to a shock in net flows. While the former displays statistical significance only contemporaneously, the latter is significant up to 10 lags. The findings hint the direction of transmission and thus support the above regression, where the foreign share is treated as the explanatory variable.

A finer analysis presents a more striking “foreigner effect”. Figure 7 reports the outcome of the following regression run for each percentile of foreign ownership:

$$\Delta P_{stock_{i,t}} = c + \alpha * \Delta Foreign_{share_{i,t}} + f_i + d_t + \varepsilon_{i,t} \quad (2)$$

for each Foreign_{share} = 1,2, ...,100

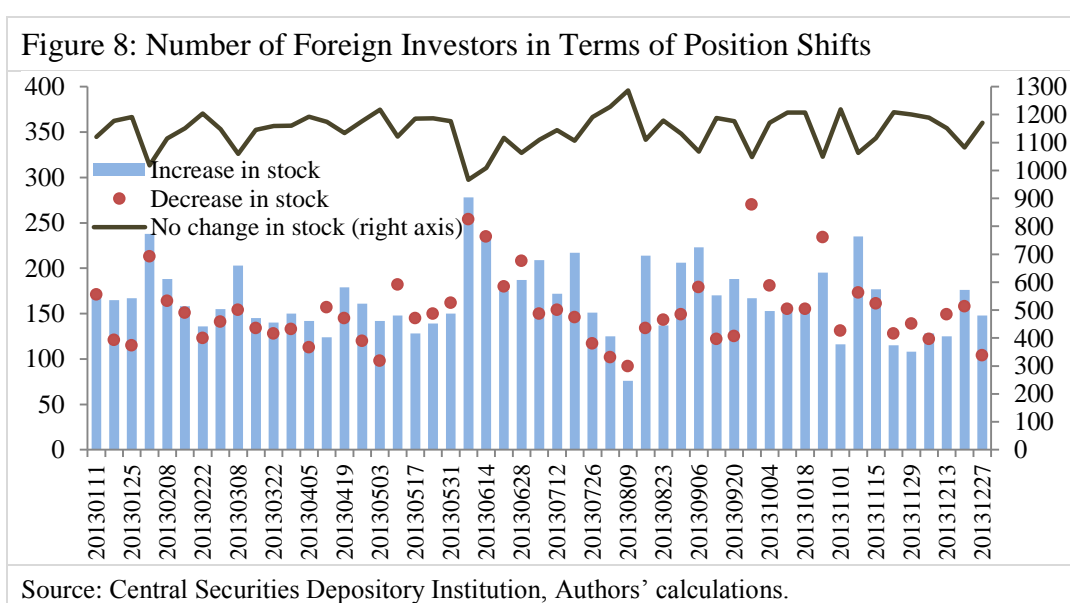
It is evident that up until a threshold of 50%, the “foreigner effect” is linear with a small positive trend, whereas after this level it climbs up exponentially.



It is very challenging to set-up a well calibrated theoretical portfolio allocation problem of foreign investors to mimic their optimal asset allocation decisions. The most important reasons for this can be reckoned as the lack of full asset allocation data of specific investors and the hardship to unify optimization constraints arising from differing fund prospectus, i.e. investment criteria. Although our data set is considerably rich, we are informed only about foreign investors' equity investments in Turkey. From that perspective our analysis assumes that foreign investors will react to specific shocks similarly. In other words, we have no conjecture about the optimization pattern of foreign investors in Turkey, because of the failure to identify their individual optimization problem, risk preferences and other constraints mandated by their choices, rules and regulations. Furthermore, since we do not have foreign investors' asset allocation among different countries and asset classes, inferring their optimization problem appears to be a challenging task.

We are very much aware of the caveats to classify all foreign investors under the same behavioral pattern. The lack of an adequate theoretical model on individual investor basis precludes us from building and calibrating a representative or heterogeneous agent portfolio optimization model. In this respect, we will focus on how empirical evidence relates to our contentions about foreign investors' entry and exit patterns in Turkey. As a result, this paper treats foreign investors as a single group behaving the same way when confronted with similar shocks. Figure 8 sheds light on some foreign investor "types" in the Turkish equity market as evidenced from a highly traded stock. Specifically, the majority appears not to resort to frequent portfolio optimization. This is evident in one of the most liquid stocks in BIST, where we have checked the change of position of individual investors by tracking the unique identifier code coined by the data provider. On the other hand, some incumbent investors unwind their position, and some incumbent or new investors scale up their asset position on a weekly basis. The figure reveals that on average there are 1462 foreign investors and 1100 of them are not changing their position in this stock from one week to the next.

Accordingly, as some foreign investors scale down, others (new entrants or incumbent investors) increase their exposure in the same week. However, at a given time the majority of foreign investors have preferred to stay put without changing their position from one week to the other. This is consistent with the evidence that on a typical day around 80% of the total trading volume is conducted by domestic investors.⁶ In other words, data shows that although on average 2/3 of the free float market cap is held by foreign investors, on average they account for 1/5th of the total daily transaction volume.



However, the figure above needs to be treated carefully because it gives an idea about foreign investors' *unconditional* herding behavior. In other words, on a typical week, although the majority of foreign investors do not rebalance their position, some investors increase their position while others scale down their investment or exit the market. The non-adjusting majority are presumed to comprise long-term investors that are valuing company fundamentals and Turkey's macroeconomic and institutional quality. Turkey has been granted investment grade by Fitch and Moody's, is an EU candidate and international business disputes arising in Turkey can be brought to international arbitration. Furthermore the global liquidity glut and expectations of dovish monetary policy

⁶ Source: Central Securities Depository Institution.

stance partially supported by moderate forward guidance of prominent central banks might be the leading causes for the majority of foreign investors not frequently changing their equity positions in Turkey.

The mechanism for frequently optimizing investors is closely related to the value of Turkish lira. Again unconditionally, i.e. in the absence of events with drastic effects on the markets, in case some foreign investors scale down and transfer their holdings abroad after converting to another currency, the depreciated Turkish lira gives an incentive for other investors to enter or increase their investment further. On the other hand, *conditional* on market distress, foreign investors might herd and thereby might be subject to a higher liquidity premium.

Herding behavior of foreign investors is well documented in the literature. Choe et al. (1999) document foreign investors' herding pattern by conducting a formal test developed by Wermers (1999), where the latter finds herding of mutual funds to be more pronounced in small market-cap stocks in the US. These results are in line with the analysis of the current study because our dataset shows that foreign investors in Turkish equity market prefer to invest in relatively more liquid shares to facilitate a possible sell-off, but still conditional on market distress, there is herding relative to already shallow liquidity, so that the cost of exit rises substantially. This herding might have a more pronounced effect given that foreigners' exit is regarded as a bearish signal by domestic investors.

In order to analyze the liquidity premium at distressed times, we consider the following specification:

$$\Delta EquityPortfolio_t = c + \alpha * Net Foreign Purchases_t + \varepsilon_t \quad (3)$$

where, $\Delta EquityPortfolio_t$ is the change in the market value of the equity portfolio of the foreign investors at time t , $Net Foreign Purchases_t$ is the net stock purchases of foreign investors at time t . In other words, the dependent variable is the change in the total portfolio value of foreign investors, whereas the independent variable represents the total net value of shares bought/sold. The data

covers January 2006-September 2014 period at weekly frequency. The source of the data is Central Bank of the Republic of Turkey (CBRT).

In Table 3, the first column implies that on a given week in the full sample period, a net foreign purchase/sale worth of 1 USD is associated with an increase/decrease of 4.04 USD in foreigners' total equity portfolio. This unconditional result changes dramatically in the rest of the analysis, where the sample is split at May 2013, when Turkey has faced a market turbulence for two reasons. First, in May 2013 FED hinted the Quantitative Easing (QE) might be gradually ended in the near future. This has affected all emerging markets negatively. Domestic developments during this period also added to the uncertainty. In other words, May 2013 has been quite unfavorable for Turkish markets in terms of both the push and the pull factors regarding foreign fund flows Columns 2-3 repeat the same analysis in two separate subsamples of before and after May 2013. The coefficients in each sub-period differ considerably.

The following columns conduct a finer analysis. Columns 6-7 focus on net purchases broken down in terms of before and after the critical May 2013 turbulence. When net purchases are analyzed, we see that the purchases in the second subsample are associated with a higher liquidity premium, in other words foreigners had to pay more to acquire shares in this period.

The last two columns focus on net sales, again separately on two sub-periods. The coefficients change substantially between the sub-periods supporting the view that conditional on market turbulence foreigners are herding and the liquidity is drying. According to column 8, as a net sale worth of 1 USD had been associated with a decrease of 3.18 USD in foreigners' total equity portfolio before May 2013, the same figure has jumped to 8.45 after May 2013 as shown in column 9. The columns of Table 3 focusing on net sales reveal that the inadequate absorption capacity of domestic investors kicks in at times when foreign investors are net sellers.

Table 3: Responsiveness of Foreigner's Portfolio Values to their Net Purchases

Dependent variable: Change in Portfolio Value of Foreigners in Equity Market

Variables	Full Sample	Pre-May 2013	Post-May2013	Net Purchase	Net Sale	Net Purchase Pre-May2013	Net Purchase Post-May2013	Net Sale Post-May2013	Net Sale Post-May2013
Net Purchases	4.04*** (0.38)	3.71*** (0.39)	6.11*** (1.27)	2.35*** (0.49)	3.65*** (1.04)	2.19*** (0.5)	3.97** (1.95)	3.18*** (1.02)	8.45* (4.52)
Constant	-148.26 (93.97)	-86.12 (97.15)	-463.14 (294.91)	382.99*** (130.89)	-596.99*** (226.96)	408.37*** (133.67)	72.88 (516.59)	-579.11** (228.18)	-216.01 (863.94)
Observations	505	430	75	315	190	275	40	155	35
R-squared	0.185	0.176	0.242	0.067	0.061	0.064	0.098	0.06	0.096

Notes: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

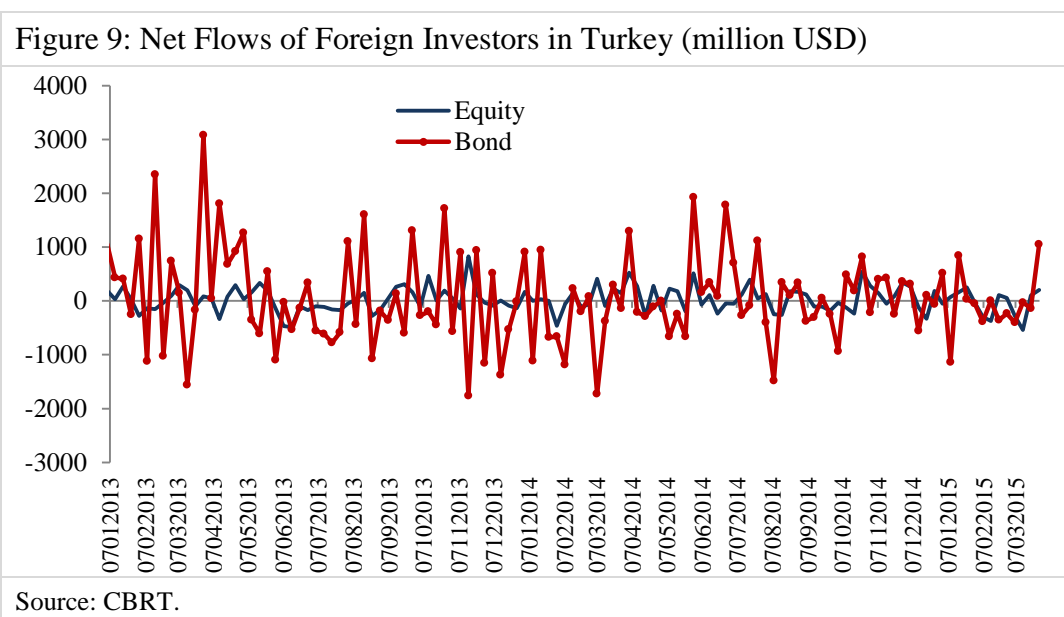
Full sample: January 2005- September 2014

Source: CBRT, authors' calculations.

As another evidence on this vein, we have checked the percentage change in number of shares owned by foreign and domestic investors in one of the heavily traded stocks on 17 May 2013 and 6 June 2013, just before and after the developments leading to end-May 2013 turbulence. During this period foreign investors have decreased the number of this particular stock they own just by 4 percent, whereas this corresponded to a 22 percent increase in number of shares held by domestic investors, accompanied by a dramatic decline of 39% of the share price.

The inadequate absorption capacity of domestic investors in BIST mainly stems from low saving rate of the country and domestic investors' preferences towards other assets, especially real estate, foreign currency and gold.

There is evidence from Turkish lira denominated government bond market about how liquidity might affect foreign investors' optimization. Figure 9 presents the net foreign flows to Turkish domestic government bond and equity markets. Evidently foreigners can enter and exit the domestic bond market much easily compared to the equity market. Although bonds and equities have different pricing dynamics, we make this comparison because both markets are subject to the same macroeconomic shocks. In this respect, the bond market might be an indicator of investor appetite for Turkish financial assets.



The Turkish government bond market is dominated by domestic investors, specifically by local commercial banks (some of them are affiliated with foreign banks, but they cannot be regarded akin to foreign portfolio investors because foreign direct investors have a different optimization problem than foreign portfolio investors). Although bonds belong to a different instrument class than equities, in terms of foreign inflows both bonds and equities are affected by similar pull/push factors. So, if foreigners would like to sell Turkish assets, we would observe foreign investor selling pressure in both markets, but liquidity constraint would be less binding in the bond market for foreign investors.

Figure 9 supports this view, in that both purchases and sales of foreigners in local bond market are much larger compared to those in the equity market, although foreigners' absolute investment is around 60 billion USD in both markets. Since the bond market is not foreigner-dominated foreign investors can enter and exit the market more easily.

5. Conclusion

In the past, sudden stops were preceded by strong capital inflows. Following the 2008-2009 global financial crisis, portfolio inflows towards developing countries have accelerated. This rapid inflow era has increased the foreign investors' representation in emerging equity and bond markets. This paper questions whether the phenomenon of "sudden" outflow of capital in the literature would be modified to "staggered adjustment" in markets with foreign dominance. In other words, we would like to investigate, whether a negative shock to EM universe such as US monetary tightening would result in an abrupt decline in foreign asset position, or whether in such a case foreigners would be able to exit at a slower pace in a market where foreigners have already made large portfolio investments. The answer to this question is important because a slower exit would result in staggered adjustment in such EM financial markets compared to a situation, where foreign ownership is lower. To the best of our knowledge, this study is the first to investigate this phenomenon using a detailed data set.

We would like to give a broader answer to that question by investigating the situation in the entire EM universe. However, we are not able to acquire a detailed data on foreign investor positions except for Turkey. The Turkish equity market is a good laboratory for our research question, as it has a high foreign investor ownership ratio compared to its peers. Our results suggest that the liquidity premium born by foreign investors is an increasing function of foreign ownership in BIST equity market. In case foreign investors desire to exit the Turkish equity market rapidly, they will find it extremely hard to sell off because there is not enough liquidity in the market. So, they would be able to sell less than what they optimally would like to because of the high price sacrifice. The results might be generalized to all emerging markets to the extent of foreign investor dominance in the specific market at hand.

References

- Bekaert, Geert, Campbell R. Harvey, and Christian Lundblad. "Does financial liberalization spur growth?" *Journal of financial Economics* 77.1 (2005): pp. 3-55.
- Bekaert, Geert, Michael Ehrmann, Marcel Fratzscher and Arnaud Mehl. "The global crisis and equity market contagion." *The Journal of Finance* (2014): pp. 2597-2649.
- Calvet, Laurent E., John Y. Campbell, and Paolo Sodini. *Measuring the financial sophistication of households. National Bureau of Economic Research* (2009): No. 14699.
- Calvo, Guillermo A. "Capital flows and capital-market crises: the simple economics of sudden stops." *Journal of Applied Economics* (1998): Vol. 1, No. 1, pp. 35-54.
- Calvo, Guillermo A., Leonardo Leiderman, and Carmen M. Reinhart. "Capital inflows and real exchange rate appreciation in Latin America: the role of external factors." *International Monetary Fund* (1993): pp. 108-151.
- Calvo, Guillermo A., Alejandro Izquierdo, and Luis-Fernando Mejía. "Systemic sudden stops: the relevance of balance-sheet effects and financial integration." *National Bureau of Economic Research* (2008): Working paper No. 14026.
- Cerutti, E., Claessens, S., Puy, M. D. (2015). "Push Factors and Capital Flows to Emerging Markets: Why Knowing Your Lender Matters More Than Fundamentals" *International Monetary Fund* (2015): Working paper No.15-127.
- Choe, Hyuk, Bong-Chan Kho, and Rene M. Stulz. "Do foreign investors destabilize stock markets? The Korean experience in 1997." *Journal of Financial Economics* 54.2 (1999): pp. 227-264.

- Claessens, Stijn, and Kristin Forbes. "International financial contagion: The theory, evidence and policy implications." *Conference "The IMF's role in emerging market economies: Reassessing the adequacy of its resources"*, Amsterdam (2004).
- Duca, Marco Lo. "Modelling the time varying determinants of portfolio flows to emerging markets." *ECB Working Paper Series* (2012) Working Paper No: 1468
- Eraslan, Veysel. "Fama and French Three-Factor Model: Evidence from Istanbul Stock Exchange" *Business and Economics Research Journal* Vol.4 Number 2 (2013): pp. 11-22
- Erduman, Yasemin, and Neslihan Kaya. "Determinants of Bond Flows to Emerging Markets: How Do They Change Over Time?" *CBRT Working Paper* (2014): No.14/28
- Forbes, Kristin J., and Roberto Rigobon. "No contagion, only interdependence: measuring stock market comovements." *The Journal of Finance* (2002): pp. 2223-2261.
- Forbes, Kristin J., and Francis E. Warnock. "Capital flow waves: Surges, stops, flight, and retrenchment." *Journal of International Economics* (2012): pp. 235-251.
- Fratzscher, Marcel. "Capital flows, push versus pull factors and the global financial crisis." *Journal of International Economics* (2012): pp. 341-356.
- Froot, Kenneth A., and Tarun Ramadorai. "Institutional portfolio flows and international investments." *Review of Financial Studies* (2008): pp. 937-971.
- Jotikasthira, Ch., Lundblad, Ch.T., Ramadorai, T. "Asset fire sales and purchases and the international transmission of financial shocks." *CEPR Discussion Paper* (2009): No. 7595.

- Kılınç, Mustafa and Cengiz Tunç “Identification of Monetary Policy Shocks in Turkey: A Structural VAR Approach” *CBRT Working Paper* (2014): No. 14/23.
- Raddatz, Claudio, and Sergio L. Schmukler. "On the international transmission of shocks: Micro-evidence from mutual fund portfolios." *Journal of International Economics* (2012): pp. 357-374.
- Ülkü, Numan. “The interaction between foreigners' trading and stock market returns in emerging Europe” *Journal of Empirical Finance* (2015): Vol.33 pp. 243-262
- Wermers, Russ. "Mutual fund herding and the impact on stock prices." *The Journal of Finance* (1999): pp.581-622.

Central Bank of the Republic of Turkey

Recent Working Papers

The complete list of Working Paper series can be found at Bank's website

(<http://www.tcmb.gov.tr>).

Sources of Asymmetry and Non-linearity in Pass-Through of Exchange Rate and Import Price to Consumer Price Inflation for the Turkish Economy during Inflation Targeting Regime

(Süleyman Hilmi Kal, Ferhat Arslaner, Nuran Arslaner Working Paper No. 15/30 November 2015)

Selective Immigration Policy and Its Impacts on Natives: A General Equilibrium Analysis

(Şerife Genç İleri Working Paper No. 15/29 November 2015)

How Does a Shorter Supply Chain Affect Pricing of Fresh Food? Evidence from a Natural Experiment

(Cevriye Aysoy, Duygu Halim Kırılı, Semih Tümen Working Paper No. 15/28 October 2015)

Decomposition of Labor Productivity Growth: Middle Income Trap and Graduated Countries

(Gökhan Yılmaz Working Paper No. 15/27 October 2015)

Estimating Income and Price Elasticity of Turkish Exports with Heterogeneous Panel Time-Series Methods

(İhsan Bozok, Bahar Şen Doğan, Çağlar Yüncüler Working Paper No. 15/26 October 2015)

External Shocks, Banks and Monetary Policy in an Open Economy: Loss Function Approach

(Yasin Mimir, Enes Sunel Working Paper No. 15/25 September 2015)

Tüm Yeni Açılan Krediler Eşit Mi? Türkiye’de Konut Kredisi ve Konut Kredisi Dışı Borç ile Özel Kesim Tasarruf Oranı

(Cengiz Tunç, Abdullah Yavaş Working Paper No. 15/24 September 2015)

A Computable General Equilibrium Analysis of Transatlantic Trade and Investment Partnership and Trans-Pacific Partnership on Chinese Economy

(Buhara Aslan, Merve Mavuş Küçük, Arif Oduncu Working Paper No. 15/23 September 2015)

Export Behavior of the Turkish Manufacturing Firms

(Aslıhan Atabek Demirhan Working Paper No. 15/22 August 2015)

Structure of Debt Maturity across Firm Types

(Cüneyt Orman, Bülent Köksal Working Paper No. 15/21 August 2015)

Government Subsidized Individual Retirement System

(Okan Eren, Şerife Genç İleri Working Paper No. 15/20 July 2015)

The Explanatory Power and the Forecast Performance of Consumer Confidence Indices for Private Consumption Growth in Turkey

(Hatice Gökçe Karasoy, Çağlar Yüncüler Working Paper No. 15/19 June 2015)

Firm Strategy, Consumer Behavior and Taxation in Turkish Tobacco Market

(Oğuz Atuk, Mustafa Utku Özmen Working Paper No. 15/18 June 2015)

International Risk Sharing and Portfolio Choice with Non-separable Preferences

(Hande Küçük, Alan Sutherland Working Paper No. 15/17 June 2015)

A Theory of Intra-Firm Group Design

(Semih Tümen Working Paper No. 15/16 June 2015)

Government Spending Multiplier in Turkey

(Cem Çebi Working Paper No. 15/15 June 2015)

Kayıt Dışı Ekonomide Beceri Edinme ve Okul Eğitimi: Yükselen Ekonomilerden Kanıtlar

(Semih Tümen Working Paper No. 15/14 May 2015)