Essays in International Finance: International Capital Flows, Equity and FX markets

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Declaration

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I declare that the first paper included in the main body of the thesis, 'Hot money in bank credit flows to emerging markets during the banking globalization era', is co-authored with my PhD supervisors Prof. Kate Phylaktis and Prof. Ana-Maria Fuertes and published in the Journal of International Money and Finance. I also declare that the second paper, 'On cross-border bank credit and the U.S. subprime crisis transmission to equity markets', is co-authored with my PhD supervisors Prof. Kate Phylaktis and Prof. Ana-Maria Fuertes.

Abstract

This thesis presents three papers in the field of international finance and provides a study of the international capital flows from a macro-finance perspective.

The first paper is an empirical investigation of the relative importance of hot money in bank credit and portfolio flows from the U.S. to 18 emerging markets over the period 1988-2012. We deploy state-space models à la Kalman filter to identify the unobserved hot money as the temporary component of each type of flow. The analysis reveals that the importance of hot money relative to the permanent component in bank credit flows has significantly increased during the 2000s relative to the 1990s. This finding is robust to controlling for the influence of push and pull factors in the two unobserved components. The evidence supports indirectly the view that global banks have played an important role in the transmission of the global financial crisis to emerging markets, and endorses the use of regulations to manage international capital flows.

The second paper examines the role played by cross-border equity, bond and bank credit flows versus international trade in the transmission of the U.S. subprime crisis to equity markets worldwide. We estimate vector autoregressive models with exogenous global factors using monthly data on 36 emerging and developed countries. The results from an eclectic methodology that includes causality tests, generalized impulse responses and forecast error variance decompositions indicate that the subprime crisis is mostly transmitted through bank credit rather than portfolio flows and international trade. The results are robust to altering the exogenous versus endogenous vectors of variables, to measuring equity prices in U.S. dollars or local currency, to averaging the data across countries versus averaging the parameters from individual country estimation, and to redefining the start date of the crisis. The findings endorse the use of banking regulation and capital controls as part of the policy toolkit to limit financial vulnerability.

Finally, the third paper examine the two steps and the prediction of Uncovered Equity Parity (UEP). Within a portfolio-rebalancing framework, UEP predicts that countries with strong equity markets should experience a currency depreciation, as higher total returns in domestic equity market will cause foreign investors to repatriate some of their investments to decrease their exchange rate exposure, leading to exchange rate depreciation. Using daily equity flow data including all the recorded trades of foreign investors for six Asian EMs from the 1990s to 2013, we find a positive rather than a negative relationship between currency and equity returns. We document that it is because the foreigners in aggregate chase returns rather than rebalance their portfolios in emerging markets, while foreign equity flows do cause exchange rate movements in the same direction. Thus, we unveil another side of UEP. Additionally, we find little evidence that foreign equity flows respond to past currency returns, suggesting that foreign equity investors only use local currency as a vehicle investing in emerging markets.

Abbreviations

List of some the abbreviations used in this thesis:

ADF	**Augmented Dickey Fuller test**
ADR	**American Depositary Receipts**
AR	**Auto Regressive**
BIS	**Bank for International Settlements**
CPI	**Consumer Price Index**
ELR	**Equity Local Returns**
EM	**Emerging Markets**
EU	**Eurozone Advanced Countries**
FX	**Foreign exchange rate**
FXR	**Foreign exchange rate returns**
GDP	**Gross Domestic Product**
GFC	**Global Financial Crisis**
GIRF	**General Impulse Response Function**
GSCI	**Goldman Sachs Commodity Index**
IMF	**International Monetary Fund**
ML	**Maximum Likelihood**
MSCI	**Morgan Stanley Capital International**
NF	**Net Flows**
OAE	**Other Advanced Economies**
RMSE	**Root Mean Square Error**
S.D.	**Standard Deviation**
S&P	**Standard and Poor**
SVAR	**Structural Vector Auto Regressive models**
TIC	**Treasury International Capital**
UEP	**Uncovered Equity Parity**
VAR	**Vector Auto Regressive models**
VARX	**Vector Auto Regressive models with exogenous variables**

Introduction

Background to the study

Researchers have shown for a long time interests in studying financial globalization, and the impact of increasing cross-border capital flows, which play an important role in international finance literature. In general, it is not uncommon to view financial globalization as a double-edged sword. On the one hand, international capital flows have the potential to bring a variety of benefits to the recipient countries, such as diversifying investors' portfolios, improving sharing of domestic households' consumption risks, and augmenting local savings and investment for future economic growth. On the other hand, international capital flows may be a channel of crisis transmission from one country to another and increase the vulnerability of a country to financial crises. The relationship between capital flows and crisis transmission is the main research objective of this thesis.

When people try to link international capital flows with financial crises, they look at two main dimensions of international capital flows, amount and composition. Coincidentally with the increase in international capital flows, in the last two decades, there have been many financial crises, such as the 1994 Mexican peso crisis, the 1997 Asian Financial Crisis, the 1999 Russian crisis, and the 2001 Latin American debt crisis (Kaminsky and Reinhart 1998; Kaminsky, 1999; Chari and Kehoe, 2003). International capital flows have recovered from the 1997 Asian Financial Crisis, and resurged again until the late 2000s Global Financial Crisis (GFC). For example, Milesi-Ferretti and Tille (2011) estimate that global capital flows increased rapidly from less than 7% of world GDP in 1998 to over 20% in 2007, but suffer large reversals in late 2008. At the same time, without significant changes in domestic macroeconomic fundamentals, worldwide equity markets experienced sharp falls in the aftermath of the U.S. subprime crisis. For example, Bartram and Bodnar (2009) document that "By the end of 2008, with few exceptions, most equity indices were at 50% or less of their end of 2006 levels." While this has been noted, an intriguing question remained about the GFC (Eichengreen et al., 2012). "How has the U.S. subprime crisis engulfed the entire world?" The perspective of international capital flows appears to be a promising avenue in answering this question.

Although there is some preliminary evidence observed on the association between international capital flows and financial crises, aggregating different capital flows may not be appropriate when one wishes to understand the connection between capital flows and a liquidity crunch in a crisis. The composition of international capital flows may be of vital importance, as it is well known that that distinct types of capital flows have distinct degrees of reversibility (Sarno and Taylor, 1999a, b; Levchenko and Mauro, 2007) and a more volatile form of capital will be more likely to fly out of the country in a crisis (see, e.g., Tong and Wei, 2011). Tong and Wei (2011) do not find a connection between a country's exposure to capital flows and the extent of the liquidity crunch experienced by its manufacturing firms when they only included total volumes of capital inflows. However, they argue this masks an important compositional effect, as a different but consistent pattern emerges when they disaggregate capital flows into three types (foreign direct investment, foreign portfolio flows and foreign loans).

Another key feature of the post-1990s trend in international capital flows up until the GFC is the dramatic resurgence of international bank credit flows relative to portfolio (equity and bond) flows, which has been characterized as banking sector globalization (Bank for International Settlements, 2009; Goldberg 2009). In terms of relative importance, official flows (such as official aids from the IMF or the World Bank) have become negligible, compared to the huge amount of private capital flows (bank credit, equity and bond flows). Using Bank for International Settlements (BIS) locational banking statistics, Milesi-Ferretti and Tille (2011) show that the holdings of cross-border bank credit at year-end has increased notably, especially, during the period 2000-2007 and reached about 60% of world GDP. Thus, banking flows were hit the hardest compared to other types of capital flows during the GFC (Milesi-Ferretti and Tille, 2011). Such recent developments in international capital flows and especially in bank credit flows raise questions such as whether the banking sector played a key role in the transmission of the crisis to emerging markets as the literature on bank globalization suggests (Aiyar, 2012; Cetorelli and Goldberg, 2011, 2012a, b; De Haas and Van Horen, 2013; Giannetti and Laeven, 2012).

Albeit less focused, but a plausible way to identify the crisis transmission role of international capital flows is to gauge their reversibility or temporariness, as it is difficult to imagine permanent international capital flows such as foreign direct investment and official aids from the IMF or the World Bank to be a transmission channel of financial crises. If a given type of capital flows served as a channel of crisis transmission to Emerging Markets (EMs), then it should appear to be dominated by a volatile and reversible component (which has the characteristics of hot money) at least during crises, so that it can assert material financial or economic influences on the original or the recipient countries and transmit crisis. Related to that is the first research question in this thesis: How has the relative amount of hot money in bank credit, and portfolio (equity and bond) flows evolved in recent years, particularly, in the run-up to the late 2000s GFC?

Of course, it is not enough to hold capital flows as a channel responsible for transmitting crises by analyzing the properties of the flows only. When quantifying the actual influences of a potential crisis-transmitting channel, a typical way is to include the equity returns of local markets, which is a key indicator of a financial crisis (e.g., Tong and Wei, 2011; Kamin and DeMacro, 2012; Forbes, 2013). Since all available information should be incorporated in the expected future profitability of firms in a country, the expected changes in real indicators should be captured by equity returns.

Moreover, it may not be a comprehensive analysis to identify each candidate for crisis-transmitting channel in isolation, as most of the literature has done, because there is the risk of omitting variables and the identified candidate of crisis-transmitting channel may proxy for other channels, which were omitted in the econometric specification. Not surprisingly, although there is a literature proposing various transmission channels of financial crises (international portfolio flows, bank credit flows, international trade and non-fundamental channels), the empirical evidence is preliminary and sometimes even contradictory (e.g., Kamin and DeMacro, 2012; Forbes, 2013). For example, Forbes (2013) explicitly points out that "Much of the earlier literature still does not answer the fundamental question of why a negative shock is transmitted internationally and through what channels contagion occurs".

However, this question is of interest to both academics and practitioners. Since 2009, there has been an increasing number of countries, which implemented reforms on the financial supervision and regulation of international capital flows in order to manage better the volatility of capital flows, e.g., Brazil, Taiwan, South Korea, Indonesia, and Thailand. Even the IMF has relaxed its opposition to capital controls and recommended them as one of various tools to limit financial vulnerability. Assessing the role played by different crisis transmission channels is crucial for the design of appropriate policy responses (e.g., Forbes, 2013). On the one hand, if the worldwide equity declines were predominantly induced by capital flows − such as "fire-selling" by panicked international portfolio investors or temporary bank liquidity withdrawals − providing liquidity or financial assistance could potentially have eased the post-crisis adjustment. On the other hand, if the U.S. subprime crisis spread to other countries through a reduction of international trade − materializing as economic losses for trade-relevant firms and, in turn, as stock value declines − capital mobility controls and liquidity injections would have been far less effective tools. A rather different scenario is where the U.S. subprime crisis transmission to worldwide equity markets might have been driven by a global meltdown in confidence (or pure contagion) in which case a greater emphasis should have been placed on structural reforms and on strengthening macroeconomic fundamentals to reduce vulnerabilities.

The literature on the U.S. subprime crisis transmission has led to a very unsettled debate, leaving a gap to fill. On the one hand, Claessens et al. (2010) and Blanchard et al. (2010) conclude that countries more integrated with global financial markets have suffered greater output losses during the crisis. Cetorelli and Goldberg (2012a, b, c) and Claessens et al. (2012) show that global banks and international trade linkages played a significant role in the spillover of the GFC, respectively. On the other hand, Rose and Spiegel (2010, 2011) find little evidence that international trade and financial linkages with the U.S. were the main channels of the subprime crisis transmission, which are roughly supported by Kamin and DeMarco (2012) and Bekaert et al. (2014). So far, there is little knowledge about the relative importance of each potential crisis-transmitting channel, especially regarding the transmission of the late 2000s U.S. subprime crisis to the rest of the world, which motivates my second research question in this thesis: Did the U.S. subprime crisis transmit to equity markets worldwide through financial channels such as equity, bond and bank credit flows, or through real economic linkages such as international trade, or additionally through non-fundamental channels?

Other than crisis transmission, the interactions between foreign equity flows and domestic asset markets have been a subject of many studies but the results are inconclusive. A relatively recent parity condition, the uncovered equity parity (UEP) condition, has been proposed in the international finance literature by Hau and Rey (2004, 2006). UEP states that, higher total returns in domestic equity market will cause foreign investors to repatriate some of their investments to decrease their exchange rate (thereafter FX) exposure, which will further lead to FX depreciation. Their empirical analysis on UEP is based on data on OECD countries (Hau and Rey, 2004, 2006). However, both Kim (2011) and Cho et al. (2014) find a positive rather than negative relationship between equity and currency returns when they extend the analysis to EMs. Cenedese et al. (2014) use a portfolio approach and find that on average FX movements do not offset equity return differentials in a cross-section of 43 countries (including both developed countries and EMs). The third and final paper of this thesis provides an explanation to the failure of UEP in EMs.

Overall, the last two decades have witnessed a series of financial crises accompanied by reversals of international capital flows and it is not uncommon to hold international capital flows responsible for transmitting the late 2000s U.S. subprime crisis to the rest of the world in the existing literature. However, there is a lack of evidence on the reversibility of international capital flows in the post 1990s bank globalization era and the relative role of financial (portfolio and bank credit flow) channels, real economic (international trade) channels, and pure contagion in the GFC. Additionally, there is little knowledge about the failure of UEP in EMs. So the analysis of this thesis is conducted empirically to fill these gaps.

Summary and contributions of the three papers

This section summarizes each of the three papers, stressing its contributions to the literature and outlining some of its results.

First Paper

The first paper of this thesis is designed to examine the evolution of the crisis-transmission role of international capital flows over time by probing whether the relative importance of hot money in bank credit and portfolio flows has changed during the period January 1988 - December 2012. It deploys unobserved component (or state-space) models à-la Kalman filter to gauge the temporariness of international capital flows from the U.S. to 9 Asian countries and 9 Latin American countries which have attracted substantial capital flows over the period 1988 to 1997. Over the recent sub-sample, 1998 to 2012, the first paper finds high temporariness in equity flows, bond flows and bank credit. The evidence supports indirectly the view that global banks have played an important role in the transmission of the global financial crisis to emerging markets, and endorses the use of regulations to manage international capital flows.

It makes two main contributions to the literature. The first contribution is methodological, as it extends the reduced-form state-space models in identifying hot money to ‘structural’ by including global (push) and domestic (pull) macro factors as potential drivers of both latent components, permanent and transitory. Theoretical models have been developed to show how crises in one area of the world economy prompt hot money to flow into other areas

(Korinek, 2011). However, there is no well-defined direct method for identifying the amount of hot money flowing into a country during a certain period. A skeptical but widely-used tool in the 1990s is accounting labels (Claessens et a., 1995; Levchenko and Mauro, 2007). Focusing instead on the time-series properties of observed capital flows, the reduced-form state-space models are utilized by Sarno and Taylor (1999a, b) to compare the size of their permanent and temporary components during the period 1988-1997. The first paper provides additional evidence on the temporariness of the capital flows by extending their reduced-form models. This constitutes a methodological novelty and can be motivated as an attempt to incorporate fundamentals (i.e., adding some economic 'structure' to the state-space decomposition) in the unobserved components analysis of capital flows. To our knowledge, no previous study that assesses the importance of the temporary (vis-à-vis the permanent) part of international capital flows has deployed 'structural' state-space models that control for push/pull factors.

The second contribution is in the banking literature, especially on banking globalization. Using data from 1988 to 1997, Sarno and Taylor (1999a, b) find bank credit flows are more permanent than temporary, and postulate that it is because that the terms of bank loans are usually fixed and the profitability of the corresponding bank will be seriously jeopardized if lending is suddenly withdrawn. However, the recent literature about rollover risk (Acharya et al., 2011; He and Xiong, 2012) supports a different view. Precisely because the terms of bank loans are fixed and their prices do not adjust automatically, private banks prefer to sign very short-term contracts. Once there are signs of financial distress, banks adjust the quantity of lending, for instance, by not rolling-over existing contracts or even retrieving previous loans. Moreover, based on this idea and the unprecedented resurgence of cross-border bank credit in the era of banking sector globalization, there is growing support for the view that bank lending played a role in the transmission of the GFC (Cetorelli and Goldberg, 2011; Giannetti and Laeven, 2012). This first paper examines the temporariness of three kinds of capital flows and finds that bank credit has gradually become temporary in the recent decade, reconciling the conflicts between the earlier evidence such as Sarno and Taylor (1999a, b) and the recent literature about rollover risk of banks (Acharya et al., 2011; He and Xiong, 2012) and banking globalization (Cetorelli and Goldberg, 2011; Giannetti and Laeven, 2012).

Second Paper

The second paper examines the relative importance of portfolio and bank credit flows versus international trade and, residually versus the pure contagion channel, in transmitting the

U.S. subprime crisis to equity markets worldwide, by employing vector autoregressive models with exogenous variables (VARX). It adopts a center (the U.S.) and periphery (36 countries, both developed and emerging markets) perspective and take the crisis year – 2007 as a threshold and divide our monthly bilateral data between the U.S. and the 36 countries of our sample over the period 1988—2012 into two sub-samples. Inspired by Rey (2013), the second paper applies two six-variable vector autoregressive models with exogenous global factors to various country groups in two sub-samples. One system is formulated for capital flows and international trade in gross terms to model the joint dynamics of the U.S. Fed fund rate, gross equity flows, gross bond flows, gross bank credit, gross international trade and equity returns. The other system is similarly formulated for the vector of variables, but equity flows, bond flows, bank credit and international trade are in net terms. The findings suggest that the crisis is mostly transmitted through bank credit rather than portfolio flows and trade. The results are robust to aggregating the data across countries versus aggregating the coefficient estimates from individual country estimation, to measuring equity prices in U.S. or local currency, to scaling the flows by domestic GDP or market capitalization and to altering the exogenous variables.

The second paper makes three main contributions to the literature. Firstly, it provides a thorough study of the relative contributions of each potential channel to the transmission of the U.S. sub-prime crisis to the rest of world, while most of the previous studies either looked at each channel in isolation, or were not comprehensive about the types of financial channels. Specifically, it examines the relative importance of financial (portfolio and bank credit flow) channels, real economic (international trade) channels and, residually the pure contagion channel, in transmitting the U.S. subprime crisis to equity markets worldwide. The second paper considers the relative importance of financial (equity, bond and bank credit) flows and international trade channels to exhaust all major fundamental channels.

Secondly, the second paper studies the transmission role of capital flows and international trade in both net and gross terms and examines whether capital flows and international trade in net terms and in gross terms reveal different information about the crisis transmission. Most of the previous work on capital flows relied on proxies for net capital flows, which may obscure the behavior of gross inward and outward flows as they may offset each other in net terms (see, e.g., Binici et al., 2010; Contessi et al., 2013). However, recent research highlights that it is not only net international portfolio flows that determine crisis transmission but also their gross flow positions (Gourinchas and Rey, 2007; Forbes and Warnock, 2012).

Even if a country's current account is relatively balanced, it may mask large gross inflows that are balanced by large gross outflows and so the country is still vulnerable to shocks as gross capital flows are very volatile and pro-cyclical (Broner et al., 2013). The argument in bank credit is similar, as Shin (2012) points out focusing on the "Global Savings Glut" (net positions), there is the danger of missing the important "Global Banking Glut" (gross positions).

Thirdly, the second paper takes account of country heterogeneity in the degree of financial system development and integration with global financial markets, providing an answer to the question raised by Kamin and DeMacro (2012) whether countries with different characteristics – income level and geographical location – help to explain changes in the prices of their stocks. Kamin and DeMacro (2012) conjecture the untested hypothesis that the determinants of distress in emerging markets might differ significantly from those in industrial economies, and narrow their scope on the transmission of the U.S. crisis to the advanced economies. The second paper divides the advanced countries into Eurozone advanced countries (EU), other advanced economies (OAE), and adds another group of emerging markets (EM) which include some of the most dynamic and fastest-growing economies in the world, such as Mainland China, India and Brazil. According to geographical location, the second paper further classifies two groups of countries as Asia and Latin America, respectively.

Third Paper

The third paper examines UEP using daily equity flow data including all the recorded trades of foreign investors for six Asian EMs from the 1990s to 2013, with the corresponding equity and FX returns at the country level over the same period. Most of the previous papers abstract from capital flows and hold the sign (and/or the magnitude) of the correlation between the FX returns and equity return differentials (or the correlation between FX returns and equity local returns) as the indicator of the validity of UEP, which may not be innocuous. The key driver of UEP is portfolio-rebalancing, which can be a strategy adopted for a subset of foreign investors but may not be for all foreign investors in EMs. As a result, UEP may hold for the specific subset of foreign investors adopting the strategy of portfolio-rebalancing but not for all foreign investors in EMs. In fact, the capital flow literature (see, e.g., Griffin et al., 2004; Richards, 2005) suggests that international equity flows respond negatively to the push factors such as equity returns in developed countries (portfolio-rebalancing), but respond positively to the pull factors such as equity returns in EMs (return-chasing). If the foreign investors in aggregate chase equity returns in EMs, it should not be surprising to find that the FX and equity local returns are positively correlated in EMs.

In terms of contribution, the third paper unveils another aspect of UEP due to a different mechanism, and finds that UEP does not automatically guarantee a negative correlation between domestic equity and FX returns. The relationship between FX and equity local returns hinges on the overall behavior of foreign equity investors at the country level, i.e., whether they pursue a portfolio-rebalancing or return-chasing strategy. The former predicts a negative correlation, while the latter creates a positive correlation between FX and equity local returns. In other words, the third paper reconciles the mixed evidence on the prediction of UEP about the correlation between FX and equity local returns in previous literature.

Overall, the contributions of the thesis are several. The thesis contributes to the literature on international capital flows by empirically identifying the unobserved temporary and reversible component (i.e., hot money) across various categories of capital flows through unobserved component (or state-space) models à-la Kalman filter, which is often overlooked by academia but it is globally important especially during crises. It also extends the analysis to investigate the relative contributions of three main types of international capital flows versus international trade, to the decline in worldwide equity markets during the late 2000s GFC period. Furthermore, the thesis contributes to the literature on UEP by unveiling another side of UEP due to a different mechanism, return-chasing.

Besides the main contribution towards the academic literature, the analysis of international capital flows is of interest to traders and investors in asset markets. In fact, the effects of foreign capital flows on local asset markets are relevant to both domestic and foreign investors, especially during crises periods. Finally, from the regulators' perspective, it is especially important to improve their understanding of the dynamics of international capital flows, given their particular roles as the financial linkages across economies for policy-makers and for the economy of a country in general.

Structure of the thesis

This thesis presents an empirical investigation of international capital flows, its determinants, influences on local asset markets and related policy implications. The main body of the thesis is developed in the following three chapters, each one presenting each of the papers. These chapters are followed by some concluding remarks.

The first chapter is an empirical investigation whether the relative importance of hot money in bank credit and portfolio flows to EMs has changed over the 1988-2012 period. Building on the first paper, my second paper, presented in the second chapter directly confronts the potential crisis-transmitting roles of various kinds of international capital flows in the Global Financial Crisis. The third chapter presents the third paper, which is an empirical investigation of the failure of UEP in EMs.

These three papers either have been or will be submitted for publication to international academic journals. The first paper is forthcoming in the **Journal of International Money and Finance**. The second paper is conditionally accepted in the **Journal of International Money and Finance**. The papers have been presented at various academic conferences, such as the Université libre de Bruxelles Research Workshop, Brussels, Belgium, 2015, the Financial Management Association (FMA) annual conference in Nashville, USA, 2014, the European Central Bank and 4th Emerging Markets Group (ECB-EMG) conference, London, UK, 2014, the 8th International Workshop of Methods in International Finance Network (MIFN), Paris, France, 2014, the XXXIX Simposio of the Spanish Economic Association (SAEe) annual conference, Palma de Mallorca, Spain, 2014, the 12th INFINITI Conference, Prato, Italy, 2014, the 13th Annual Bank Research Conference, Arlington, USA, 2013, the 1st Paris Financial Management Conference, Paris, France, 2013 and various PhD Research Days and workshops at Cass Business School from 2013 to 2015.

Although the first two papers are co-authored with my supervisors, Professors Kate Phylaktis and Ana-Maria Fuertes, the bulk of the work was done by myself. The third paper is a solo paper.

3 Can Return-chasing Explain the Failure of Uncovered Equity Parity in Emerging Markets?

"The increasing size and equity content of current capital flows has not yet inspired a new financial market paradigm for exchange rate theory, in which exchange rates, equity market returns, and capital flows are jointly determined." (Hau and Rey, 2006)

3.1 Introduction

A relatively recent parity condition, the uncovered equity parity (UEP) condition, has been proposed in the international finance literature by Hau and Rey (2004, 2006). The main intuition behind UEP is one of portfolio-rebalancing (Hau and Rey, 2006, p277). Under the assumption of incomplete exchange rate (hereafter FX) risk hedging, UEP has two steps and one prediction: First, when the total returns of domestic equity holdings outperform foreign holdings (due to shocks from either equity or FX markets), foreign investors are exposed to higher relative FX exposure and decide to repatriate some of the domestic equity to decrease the FX risk. Second, the associated selling of domestic currency leads to domestic currency depreciation. Therefore, UEP predicts a (theoretically perfect) negative correlation between the performance of FX and equity returns in local currency.

UEP is of essential importance for at least two reasons. On the one hand, it asserts that foreign equity flows can explain FX movements, which have been notoriously difficult to predict using other macro-economic variable (for a seminal paper, see, Meese and Rogoff, 1983). On the other hand, from the perspective of international investing and portfolio management, it is also important for global investors, as in most cases investments in equity markets of different countries inevitably involve investments in corresponding FX markets.

Albeit of importance, only a few research papers empirically test UEP, perhaps because of the limited data availability of international capital flows[17]. While Curcuru et al. (2014) investigate the two steps of UEP but not its prediction, the other papers mostly abstract from capital flows and only examine its prediction, the negative correlation between the FX returns and equity return differentials, or the

[17] For instance, Cho et al. (2014) note “Unfortunately, testing these conjectures empirically is not easy, mainly because of the lack of appropriate data”.

correlation between FX returns and domestic equity returns in local currency (hereafter equity local returns). For instance, Hau and Rey (2006) propose UEP and show a negative correlation between equity return differentials and FX returns within a sample of 17 OECD countries vis-à-vis the US. Similar to UEP, Cappiello and De Santis (2007) propose a negative correlation between expected equity return differentials and expected FX returns and verify it using monthly data from the UK, Germany and Switzerland vis-à-vis the US. However, Kim (2011) find a positive correlation between equity local returns and FX returns in emerging markets (hereafter EMs), and suggest that it may be due to strong market risks. The failure of UEP in EMs has been confirmed by Cenedese et al. (2014) [18], who use a portfolio approach and find that on average FX movements do not offset equity return differentials in a cross-section of 43 countries (including both developed countries and EMs).

However, it may not be innocuous to abstract from capital flows and hold the sign (and/or the magnitude) of the correlation between the FX returns and equity return differentials (or the correlation between FX returns and equity local returns) as the indicator of the validity of UEP. The key driver of UEP is portfolio-rebalancing, which can be a strategy adopted for a subset of foreign investors but may not for all foreign investors in aggregate in EMs. As a result, UEP may hold for the specific subset of foreign investors adopting the strategy of portfolio-rebalancing but not for all foreign investors in aggregate in EMs. In fact, the capital flow literature (see, e.g., Griffin et al., 2004; Richards, 2005) suggests that international equity flows respond negatively to the push factors such as equity returns in developed countries (portfolio-rebalancing), but respond positively to the pull factors such as equity

[18] In the appendix section of a previous version, Cenedese et al. (2014) find a negative correlation between equity local returns and FX returns for almost every developed country but a positive correlation for almost every EM.

returns in EMs (return-chasing). If the foreign investors in aggregate chase equity returns in EMs, it should not be surprising to find that the FX and equity local returns are positively correlated in EMs.

So far, we are aware of only a couple of research papers, which have empirically tested UEP with capital flow data after Hau and Rey (2004, 2006). The first one is Curcuru et al. (2014), who test the two steps of UEP separately with data on U.S. investors' monthly equity positions across 42 markets from 1990 to 2010. Curcuru et al. (2014) cannot test the prediction of UEP on the correlation between FX returns and equity local returns, as it can only be tested with equity flow data of all foreign investors, rather than any subset of foreign investors in the country. The rationale is that the effects on FX markets of any subset of foreign investors may be offset by other subsets of foreign investors if they trade against each other. The other one is Cho et al. (2014), who construct quarterly net capital flow data for 9 developed and 12 emerging markets from 1996 to 2009 from Balance of Payments account data reported by the International Monetary Fund (IMF). The data set used in Cho et al. (2014) covers all foreign investors, but as they admitted "the data employed in this analysis are somewhat crude in terms of its frequency". Since equity and FX markets can fluctuate substantially even within a day, the problem of information loss can be really serious if the matched capital flow data are in low frequency such as monthly or quarterly. Accordingly, in this paper we examine the two steps and the prediction of UEP using daily equity flow data including all the recorded trades of foreign investors for six Asian EMs from the 1990s to 2013.

To the best of our knowledge, we are the first to examine both the two steps and the prediction of UEP. In line with the traditional literature on the relationship between international capital flows and asset returns, the main methodology in this paper is vector autoregressive models, including both reduced-form vector autoregressive models (VAR) and structural vector autoregressive models (SVAR).

We start by probing the contemporaneous relationship among flows, FX returns and equity local returns in our preliminary data analysis. We confirm a positive correlation between FX and equity local returns in EMs found in a few recent papers (Kim, 2011; Cho et al., 2014; Cenedese et al., 2014), which we term as the failure of UEP in EMs. Since the failure of UEP in EMs may arise from either the first step or the second step of UEP, we tackle both steps in turn.

The first step of UEP states that foreign equity investors rebalance away from (toward) countries whose equity/FX markets have recently performed well (poorly), but we find contradicting and asymmetric results in domestic equity and FX markets. On the one hand, foreign equity flows respond positively to the past equity local returns. On the other hand, foreign equity flows are insensitive to the past FX returns, echoing with the results of Curcuru et al. (2014) for U.S. equity investors. Thus, the hypothesis of portfolio-rebalancing is clearly rejected in both domestic equity and FX markets in our sample of six EMs.

Then we assess the motives behind the responses of foreign equity investors to past equity local returns by decomposing the current returns into an expected component and an unexpected component, and find that the responses of foreign equity investors are mainly due to the expected equity local returns. In other words, foreign equity investors chase expected equity local returns, and past equity returns signal expected current equity returns because of the momentum in equity returns. This would be consistent with the little evidence that foreign equity investors respond to past FX returns, as there is little momentum in FX returns.

As regards to the second step of UEP, we find a strong contemporaneous positive relationship between foreign equity flows and FX returns, and a weak inter-temporal relationship which implies that foreign equity flows may also have a positive and permanent impact on future FX returns.

This paper contributes to the literature in several directions. First of all, we unveil another side of UEP due to a different mechanism in the first step, and find that UEP does not automatically guarantee a negative correlation between domestic equity and FX returns. The relationship between FX and equity local returns hinges on the overall behavior of foreign equity investors in aggregate, i.e., whether they pursue a portfolio-rebalancing or return-chasing strategy. The former predicts a negative correlation, while the latter creates a positive correlation between FX and equity local returns. In other words, we reconcile the mixed evidence on the prediction of UEP about the correlation between FX and equity local returns in developed and emerging markets.

Second, we find distinct mechanism in FX markets from equity markets in the first step of UEP, as we find litter evidence that foreign equity flows respond to past FX movements, suggesting that foreign investors in aggregate in EMs mainly use exchange rates as a vehicle (Goldberg and Tile, 2008; Devereux and Shi, 2013). It is consistent with the vital assumption of incomplete hedging of FX risk in UEP, and the extremely low hedge ratios for foreign equity investment (e.g., Levich et al., 1999; Curcuru et al., 2014). Given the huge volatility in FX markets even at short horizons (see, e.g., Bank of International Settlements, 2013), it would be surprising to find that foreign equity investors systematically respond to past FX movements.

Third, we provide additional evidence on the second step of UEP, as we find a strong contemporaneous positive relationship between foreign equity flows and FX returns, and a weak inter-temporal relationship which implies that foreign equity flows may also have some positive and permanent impact on future FX returns. Permanent impacts on FX returns are usually due to private information incorporated in currency order flows[19] (e.g., Evans and Lyons, 2002a, b, c). Given the difficulty in

[19]Although net capital flows and order flows are similar in nature, they are completely two things. While net capital flows is the net of foreigners' net purchases from the residents and the residents' net purchases from foreigners in domestic markets, order flows is the "net of buyer-initiated and seller

forecasting FX dynamics at short horizons (e.g., Meese and Rogoff, 1983) and the inactive trading pattern of foreign equity investors (Richards, 2005, p5), it is hard to imagine that foreign equity investors hold private information about FX markets. A more likely explanation is that the net foreign equity flows and the currency order flows are closely aligned as documented in UEP[20]. The only difference between our analysis and the one in Hau and Rey (2004, 2006) is that we find it in a return-chasing rather than portfolio-rebalancing framework.

Finally, we contribute to another unsettled debate whether foreign investors pursue a return-chasing or a portfolio-rebalancing strategy regarding equity local returns (e.g., Curcuru et al., 2011). Previous results either come from low frequency such as monthly data (e.g., Curcuru et al., 2011), or from a short span of daily data one decade ago (e.g., Griffin et al., 2004; Richards, 2005). We find that foreign equity investors in aggregate pursue a return-chasing rather than portfolio-rebalancing strategy regarding equity local returns in EMs, in consistence with most of the studies (e.g., Griffin et al., 2004; Richards, 2005). However, we do not exclude the possibility that a specific group of investors such as the U.S. equity investors in Curcuru et al. (2011) might pursue a portfolio-rebalancing strategy.

The rest of the paper unfolds as follows. In the next section, we discuss the related literature. Section 3.3 outlines the data and preliminary data analysis. Section

initiated orders"(Evans and Lyons, 2002a). There are at least two kinds of order flows in the existing literature: currency order flows, equity order flows.

[20]Hau and Rey (2004, p127) note that "Yet simple portfolio shifts could also give rise to order flow without any role for information asymmetries. Within the portfolio-rebalancing framework and conditional on exogenous equity return and exchange-rate shocks, it is plausible that net capital flows and order flows are closely aligned. Conditional on an exogenous appreciation of his foreign wealth for example, the home investor is likely to initiate the selling of foreign assets as well as the selling of foreign currency balances."

3.4 examines the first and the second step of UEP in turn. Section 3.5 compares our explanation with the other existing explanations in literature, while Section 3.6 checks robustness. Section 3.7 concludes with a summary.

3.2 Literature review

Corresponding to the two steps of UEP, our paper mainly relates to two strands of international finance literature dealing, with the reactions of foreign investors to past equity local returns and FX returns, and with the impacts of foreign equity flows on FX returns, respectively.

We start with the strand of literature on the reactions of foreign investors to past equity local returns, which is still unsettled. In a seminal paper, Bohn and Tesar (1996) use an intertemporal international capital-asset-pricing model to decompose the net purchases of U.S. equity investors in other markets into: 1) transactions that are necessary to maintain a balanced portfolio of securities, so-called "portfolio-rebalancing", and 2) net purchases that are triggered by time-varying investment opportunities. They find U.S. transactions in other markets are primarily driven by the latter effect, as U.S. investors tend to move into markets where returns are expected to be high and retreat from markets when expected returns are low, so-called "return-chasing". Since then, return-chasing has been seen as a stylized fact, confirmed by subsequent studies (Froot et al., 2001; Griffin et al., 2004; Richards, 2005; Froot and Ramadorai, 2008) and incorporated in theoretical models (Brennan and Cao, 1997; Guidolin, 2005; Albuquerque et al., 2007, 2009; Dumas et al., 2014). However, as criticized by Curcuru et al. (2011), most of the previous empirical studies[21] use bilateral flow data and cannot perfectly control for the effects from the

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[21]Two noteworthy exceptions are Froot et al. (2001) and Froot and Ramadorai (2008), who use daily portfolio holdings data over the period from 1994 to 1998 from State Street Company and find that US equity investors chase equity local returns as well.

changes in financial wealth of the investors. Using monthly portfolio holdings data and portfolio-based techniques, Curcuru et al. (2011) find that U.S. equity investors neither chase equity returns nor buy past losers, but sell past winners, a form of partial rebalancing.

With less literature about the effects of past FX returns on flows, the case here is no clearer at all. For instance, Adler and Dumas (1983) suggest that foreign equity investors will hedge their equity purchases against currency risk and take no actions regarding past FX movements. More importantly, in this case foreign equity investors have no essential impact on FX markets and UEP degenerates into the simple interactions between equity local returns and equity flows without a role of FX (Froot et al., 2001; Griffin et al., 2004; Richards, 2005). However, surveys of investors suggest that international equity positions are typically unhedged (e.g., only 8% according to Levich et al., 1999). This is not only true in national statistics but also at the level of individual equities (Curcuru et al., 2014, p90). Hau and Rey (2004, 2006) suggest that foreign equity investors will repatriate some of the investment when FX appreciates, in stark contrast with the "currency carry trade" literature (Lustig and Verdelhan, 2007; Burnside et al., 2008; Brunnermeier et al., 2008; Lustig et al., 2011), which states that investors should increase their allocations to the currencies that have performed well and these currencies would continue to appreciate. Menkhoff et al. (2014) find that FX investors can either be positive feedback investors or negative feedback investors via currency order flows. Curcuru et al. (2014) find evidence that U.S. equity investors do not react to currency movements.

There are few research papers analyzing the impact of foreign equity flows on FX returns, although many about the impacts of foreign equity flows on equity local returns (e.g., Froot et al., 2001; Griffin et al., 2004; Richards, 2005; Froot and Ramadorai, 2008). Perhaps the only one is Hau et al. (2010), who find a downward sloping demand curve in FX markets and a FX impact of the equity flows arising from the redefinition of the Morgan Stanley Capital International (MSCI) Global Equity Index in 2001 and 2002. While Froot and Ramadorai (2005) find currency flows of intuitional investors can only cause short-term price pressures in FX markets, studies on microstructure generally suggest that currency order flows can cause permanent rather than temporary FX returns due to incorporated private information (e.g., Evans and Lyons 2002a, b, c; Hau et al. 2002; Killeen et al. 2006). Bridging the studies on macroeconomic and microstructure studies, Hau and Rey (2004) explicitly point out that, as a part of UEP, net foreign equity flows and currency order flows are closely aligned. While Hau and Rey (2006) and Curcuru et al. (2014) find evidence of a positive contemporaneous correlation between foreign flows and FX returns, foreign equity flows may also have a permanent impact on future FX returns in the same direction (Hau and Rey, 2004). It is difficult to detect this inter-temporal relationship within low-frequency data, while our daily data put us in a better position to investigate the potential effects of past foreign equity flows on FX returns.

3.3 Data

In this section, we report the source, description, the comparison of our data with data sets used in previous literature, and the preliminary analysis of our data sets.

3.3.1 Description of data

Our data set mainly consists of net equity flows, FX returns, and equity local returns in daily frequency for six Asian EMs.[22] Our capital flow data set has two main advantages, which makes it an ideal candidate to test UEP. On the one hand, since

[22] As claimed by Richards (2005): "The sample size of six markets is large enough to provide results that are potentially fairly general, yet is small enough to allow more attention to market-specific data and modeling issues than might be possible in datasets with a larger number of markets."

the data set includes all the recorded trades of foreign investors from the stock exchanges, it has a broader coverage than data covering only one group of investors – for example, U.S. investors in studies using data from U.S. Treasury (e.g., Brennan and Cao, 1997; Hau and Rey, 2004, 2006) or Federal Reserve (Curcuru et al., 2011, 2014), or mutual funds (e.g., Hau and Rey, 2008) or customers of a particular custodian (Froot et al., 2001, Froot and Ramadorai, 2005, 2008). On the other hand, daily data allow a "precise" analysis of the short-term effects and determinants of foreign flows (Richards, 2005, p.7)[23]. If foreign equity flows cause returns or respond systematically to recent returns in FX or domestic equity markets, these linkages should be captured in our data.

Our data of daily net equity flows in the six East Asian markets are obtained via the exchanges of the markets, Bloomberg and CEIC databases.[24] A small number of obvious errors have been observed by cross-checking different databases. We drop a small percentage of unreliable earlier sample and the winsorize the data at 99% level. The final sample begins from September 9, 1996 for Indonesia (JSX), June 30, 1997 for Korea (Kospi), March 15, 1999 for Korea (Kosdaq)[25] and Philippines (PSE), January 1, 2001 for Taiwan (TWSE)[26], and December 1, 1997 for Thailand (SET).

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[23] In the terminology of Richards (2005), this data set is "precise" as it records the actual trade dates. Proprietary data for flows such as the one used in Froot, et al. (2001) are based on contractual settlement dates, and the trade dates are inferred from settlement conventions in each country.

[24] Similar data sets have been used in Richards (2005) or Griffins et al, (2004) but with a much shorter span (around three years). Details of CEIC database can be found as follows (http://www.ceicdata.com). Richards (2005) provides a detailed description of the data of capital flows.

[25] The first five are traditional "main boards", while Kosdaq is a "second board" focusing on start-up and technology-related companies in Korea. Both the first five markets and Kosdaq have been studied in Richards (2005) as well.

[26] For Taiwan (TWSE), we have data from Oct 25, 2000 but only used data from January 1, 2001 due to two reasons. On the one hand, there is Saturday trading in Taiwan on the first, third and fifth

The ending date is December 30, 2013 for all markets. Foreign investors in these markets must register with the local exchange or regulator, and brokers must report the nationality of the buyer and seller in each transaction that occurs. The resulting data capture the trading of all registered foreign investors. We also obtain the daily market capitalization of each market from Bloomberg and scale daily net purchases of foreigners by local market capitalization so that the scaled flows we actually use are in percentages [27, 28].

Equity local returns (in %) are constructed as "log returns" of the main capitalization-weighted index of stocks traded on these markets in local currency. Ideally, UEP should be tested with the time-varying holding weight of each individual local stock for every foreign investor, so that researchers can calculate the portfolio returns earned by all foreign investors in aggregate. While the directly measured returns series based on foreign investors' holdings do not exist, the literature suggests using publicly available country-level equity indices comprising of the largest and most liquid firms in each country, as foreigners tend to hold the largest and most liquid domestic stocks (see Curcuru et al., 2014 and the relevant references therein). We use the daily closing prices of Jakarta JSX Composite Index in Indonesia, the Kospi Index and the Kosdaq Index in Korea, the PSE Composite

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Saturdays of each month in 2000. On the other hand, the 75% foreign investment ownership limit has been removed at the end of 2000.

[27] Following Froot et al. (2001) and Richards (2005), we do not include net purchases by foreigners of American Depositary Receipts (ADRs) or country funds in foreign markets, equity futures or other derivatives in the domestic markets.

[28] In daily frequency and over such a long span, we are only able to obtain data for the six markets which have floating exchange rates. We are aware that Ulku and Weber (2014) use data from May 4, 2004 to April, 30 2012 for a European country — Turkey from the Central Registry Agency and Clearing and Custody Bank of Turkey. Unfortunately we find difficulties in accessing that data. Yet, the regional movement of capital flows in Europe and Asia may not be the same.

Index in the Philippines, the TWSE/TAIEX Index in Taiwan, and the Bangkok SET Index in Thailand, respectively. Unlike some of other indices provided by international providers such as Morgan Stanley Capital International (MSCI)[29] and Standard and Poor's (S&P) indices, these indices are actually the "headline" indices available to investors on a real-time basis.

Daily FX returns (in %) are constructed as the "negative log returns" of the daily exchange spot rate data. The conventional market quotation is the number of local currency per U.S. dollar, and positive FX returns mean local currency appreciation. We are aware that local currency can be priced by currencies other than the U.S. dollar (e.g., Cho et al., 2014), but the case should be similar due to the famous triangle arbitrage in FX markets. As a result, the local currency is priced by the U.S. dollar all over this paper. Importantly, the exchange rates are neither under fixed nor managed float exchange rate system over our sample period for these countries. We choose the spot exchange rates exactly corresponding to the closing time of domestic equity markets from the WMR/Reuters database via DataStream, Bloomberg and local exchanges.

In comparison with the data sets used in previous literature, we employ a relatively high frequency (daily) and long span (more than one decade) data set including all the recorded trades of foreign investors for six Asian emerging equity markets, allowing a very precise examination of UEP. In contrast, many previous papers use monthly FX and equity returns data without considering capital flows, such as Cappiello and De Santis (2007), Kim (2011) and Cenedese et al. (2014). Only a few papers have tried the capital flow data but the data in these papers are less suitable for UEP than our data.

For instance, after introducing their equity and FX data, Hau and Rey (2006,

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[29] Our results hold when we use MSCI equity index data.

p298) note that "portfolio flow data are more difficult to obtain". Hau and Rey (2004, 2006) use monthly bilateral equity flows between the U.S. and OECD developed countries from the U.S. Treasury International Capital (TIC) database, acknowledging the famous shortcoming that equity transactions in TIC database are recorded by the nationality of the person with whom the transaction is carried, not by the country that originally issued the security (Hau and Rey, 2006, p299).

Cho et al. (2014) try to explain the magnitude of the correlation between FX and equity local returns by using quarterly Balance of Payment data from the International Financial Statistics (IFS) reported by the IMF to construct net capital flows. Cho et al. (2014) explicitly note "Since we are using data over quarterly intervals, information loss would be more serious than when we use finer data, for example, over monthly intervals. Not only the number of observations is reduced, but also inter-temporal changes in variables within the quarter are netted out, making the power of statistical tests smaller. Therefore, we conjecture that if we are able to use data at higher frequency, we might be able to obtain more significant results".

3.3.2 Preliminary data analysis

The properties of the three variables that are the focus of our analysis – net flows (NF_{it}), equity local returns (ELR_{it}) and FX returns (FXR_{it}), – are shown in Table 3.1 over the period from various starting dates in the 1990s to December 30, 2013, since the sample period differs for each market.

We report the starting date of the sample, the mean, median, and standard deviation of net flows and returns, the first five autocorrelation estimates for each series, and the contemporaneous correlation coefficients between net flows and equity local returns, equity local returns and FX returns, and net flows and FX returns, respectively.

The mean values of net flows (NF_{it}) are all positive, indicating that over the whole sample there are more purchases than sales by foreign equity investors in these six EMs. In contrast, the mean values of FX returns (FXR_{it}) and equity local returns (ELR_{it}) can be both positive and negative, which demonstrates the heterogeneity of our data. However, the median values are all positive, implying the profitability of investing in EMs. The standard deviation of net flows (NF_{it}) varies across markets, from 0.013% for Philippines (PSE) to three times as much (0.040%) for Taiwan (TWSE), which is consistent with Griffin et al. (2004) to find that in all markets most daily foreign net activity is generally less than 0.1% of market capitalization.

Consistent with previous literature on capital flows (Froot et al., 2001; Griffin et al., 2004; and Richards, 2005), we find substantial positive autocorrelation in daily net flows (NF_{it}), with a median first-order autocorrelation coefficient of 0.451. The autocorrelation in net flows declines slowly and is significant over the past 5 lags in general, perhaps due to motives to mitigate market impacts or the heterogeneous information processing speeds of different types of investors (Griffin et al., 2004). Daily returns in equity markets are also significantly autocorrelated with its first lag, with a median first-order autocorrelation coefficient of 0.100 for equity local returns (ELR_{it}). In contrast, daily FX returns (FXR_{it}) are not correlated with its first lag except for Thailand (SET), with a median first-order autocorrelation coefficient of -0.002. Unlike equity local returns, there is little momentum in FX returns, and previous day's FX returns provide little information for the current FX returns.

The last three columns show contemporaneous correlation between net flows and equity local returns, equity local returns and FX returns, and net flows and FX returns, respectively. While UEP suggests that the correlation coefficient between past equity local returns and current foreign equity flows should be negative, we find a positive contemporaneous correlation between equity local returns and flows. In particular, within each market there is a strong positive same-day correlation between daily net flows and equity local returns, with a median correlation coefficient of 0.304, consistent with previous literature on capital flows and equity local returns (e.g., Froot et al., 2001; Griffin et al., 2004; Richards, 2005). Interestingly, for every market there is also a statistically significant positive correlation between equity local returns and FX returns ranging from 0.20 (Indonesia and Thailand) to 0.31 (Taiwan), with a median correlation coefficient of 0.269. The prediction of a negative correlation between equity local returns and FX returns is clearly rejected here, and the size of the correlations is comparable to the results from previous literature (e.g., the size of pairwise correlation between weekly equity local returns and FX returns varies from 0.121 (Czech) to 0.485 (Mexico) in EMs in panel B of Table III in Cho et al., 2014). We also use various measures of global returns (S&P 500, Nasdaq, Philadelphia Semiconductor, MSCI World, MSCI EM) used in Richards (2005) to construct return differentials and confirm the failure of the prediction of UEP in EMs. Although it is unclear whether the failure of UEP in EMs arises from its first step (portfolio-rebalancing) or its second step (equity flows cause FX returns), we also find a statistically significant positive same-day correlation between daily net flows and FX returns with a median correlation coefficient of 0.103, providing some preliminary support for the second step of UEP.

3.4 Empirical assessment of UEP in EMs

In this section, we examine the two steps of UEP in turns. We start by examining whether foreign equity investors pursue a portfolio-rebalancing strategy regarding the past equity local returns and past FX returns as suggested by the first step of UEP. After that, we examine the motives behind the behaviors of foreign equity investors, i.e., do foreign equity investors chase returns in EMs indeed? Finally, we examine whether foreign equity flows cause FX returns as suggested by the second step of UEP.

3.4.1 The first step of UEP: Do foreign equity investors rebalance?

The first step of UEP indicates that foreign equity investors in aggregate pursue a portfolio-rebalancing strategy regarding the past total equity returns (including equity local returns and FX returns) in EMs, which itself has two parts. One part is that foreign equity investors pursue a portfolio-rebalancing strategy regarding the past equity local returns in EMs. The second part is that foreign equity investors also rebalance from the FX returns in EMs. Curcuru et al. (2014) find no support for the second part but strong support for the first part, which cannot explain the failure of UEP in EMs. We examine these two parts step-by-step.

In line with the previous literature on international capital flows and domestic equity returns such as Froot et al. (2001), Griffin et al. (2004) and Richards (2005), we utilize a structural vector autoregressive models (SVAR) with 5 lags (motivated below) for each country where we cast the joint dynamics of the variables for Net Flows (NF_{it}) and Equity Local Returns (ELR_{it}) in model (3.1) below. The VAR is structural as we include contemporaneous equity local returns into the flows equation (3.1b), which is a key setup to test the first step of UEP. We are particularly interested in whether the past equity local returns positively or negatively predict flows over and above the predictions of lagged flows, after controlling for the contemporaneous equity local returns. [30]

$$ELR_{i,t} = \alpha_{ELR} + \sum_{d=1}^{5}\phi_{1,1,d} * ELR_{i,t-d} + \sum_{d=1}^{5}\phi_{1,2,d} * NF_{i,t-d} + u_{i,t}^{ELR} \quad (3.1a)$$

[30] The SVAR here only allows for a contemporaneous effect of returns on flows, which is different from the typical SVAR with only the contemporaneous flows in the returns equation, stemming from Hasbrouck (1991). We ask how the past returns affect flows, while most literature focuses on how the past flows affect returns. As pointed out by Ulku and Weber (2013, p.2734), while the set-up in Hasbrouck (1991) may be legitimate under a dealer system without frictions with tick data, flows may also be affected by contemporaneous returns with daily or less frequent data due to intra-period feedback trading (Brenan and Cao, 1997).

$$NF_{i,t} = \alpha_{NF} + \sum_{d=0}^{5}\phi_{2,1,d} * ELR_{1,t-d} + \sum_{d=1}^{5}\phi_{2,2,d} * NF_{i,t-d} + u_{i,t}^{NF} \quad (3.1b)$$

$$\text{where} \begin{bmatrix} u_{i,t}^{ELR} \\ u_{i,t}^{NF} \end{bmatrix} \approx N\left[0,\ \mathbf{D}_i^{ELR,NF}\right],\ \mathbf{D}_i^{ELR,NF} = \begin{bmatrix} \sigma_{u,i,ELR}^2 & 0 \\ 0 & \sigma_{u,i,NF}^2 \end{bmatrix}$$

However, there is a risk of missing variables associated with this set-up. To the extent that FX returns are contemporaneously correlated with equity local returns, as we have shown in the preliminary analysis, a positive or negative relationship between foreign flows and domestic equity (FX) returns could simply be proxying for a FX (equity) effect. (Griffin et al., 2004, p652). This conjecture is plausible but there is little evidence about it. To test this conjecture, we follow Griffin et al. (2004, p652) and add five lags of FX returns as an exogenous variable into the SVAR and compare the results from the model (3.2) below with the ones from model (3.1):

$$ELR_{1,t} = \alpha_{ELR} + \sum_{d=1}^{5}\phi_{1,1,d} * ELR_{1,t-d} + \sum_{d=1}^{5}\phi_{1,2,d} * NF_{i,t-d} + \sum_{d=1}^{5}\phi_{1,3,d} * FXR_{1,t-d} + u_{i,t}^{ELR} \quad (3.2a)$$

$$NF_{i,t} = \alpha_{NF} + \sum_{d=0}^{5}\phi_{2,1,d} * ELR_{1,t-d} + \sum_{d=1}^{5}\phi_{2,2,d} * NF_{i,t-d} + \sum_{d=1}^{5}\phi_{2,3,d} * FXR_{1,t-d} + u_{i,t}^{NF} \quad (3.2b)$$

$$\text{where} \begin{bmatrix} u_{i,t}^{ELR} \\ u_{i,t}^{NF} \end{bmatrix} \approx N\left[0,\ \mathbf{D}_i^{ELR,NF}\right],\ \mathbf{D}_i^{ELR,NF} = \begin{bmatrix} \sigma_{u,i,ELR}^2 & 0 \\ 0 & \sigma_{u,i,NF}^2 \end{bmatrix}$$

We order the equity local returns before flows, so that we can make sure that flows do not affect equity local returns contemporaneously through a simple Choleski factorization. No matter whether including an exogenous variable or not, our SVAR systems are exact identified and can be estimated separately for each country as seeming unrelated regressions (SURs). Before presenting the empirical results from various models, we check that all eigenvalues having moduli less than one so that our SVARs are stationary. Unlike Froot et al. (2001), we do not restrict the autoregressive coefficients to be the same across countries, as the degree of freedom is not a problem for us. By the Hannan–Quinn Information Criterion, the lag length is suggested to be from 2 to 5, and 5 in most of cases. As a result, we set the lag length at 5 as Griffin et al, (2004) and Richards (2005), which means that we are examining weekly effects with daily data as five trading days forming one week.

Table 3.2 shows the results from the equity local returns equation for the bivariate SVAR of foreign equity flows and equity local returns with no exogenous variable in Panel A, and for the bivariate SVAR of foreign equity flows and equity local returns including FX returns as an exogenous variable in Panel B, respectively. We report the estimates of the contemporaneous net flows and the past net flows up to 5 lags, adjusted R^2 and the p-value of Granger causality test for the hypothesis: Past equity local returns do not Granger-cause flows. In general, the results from Panel A and Panel B are similar.

The results in both Panel A and Panel B of Table 3.2 show that past equity local returns positively predict flows over and above the predictions of lagged flows, as the sum of the coefficients of past equity local returns is positive, after controlling for the contemporaneous equity local returns. In fact, the estimated coefficients of one-day lagged equity local returns are all positive and strongly significant. For instance, in both Panel A and Panel B of Table 3.2, the estimated coefficients of one-day lagged equity local returns are highly significant, ranging from 0.001 (PSE) to 0.005 (Kospi). In all six markets, Granger causality tests strongly reject the null hypothesis that past equity local returns do not Granger-cause flows with p-values less than 0.001. The adjusted R^2 ranges from 0.105 (PSE) to 0.516 (TWSE) in Panel A, and 0.104 (PSE) to 0.516 (TWSE) in Panel B, which is comparable to the existing literature on the interaction of foreign equity flows and equity local returns (Griffin et al., 2004; Richards, 2005).

Figure 3.1 presents the responses of flows to a one-standard deviation innovation in past equity local returns using general impulse response functions (GIRFs). We only report the results based on equation (3.2b), as the results based on equation (3.1b) are similar. The GIRFs are invariant to the ordering of the variables in the VARX so that there is no need of assumptions on the sequence of shocks (Pesaran and Shin, 1998). Over a 10-day period, we find that the current equity local returns have a positive and significant influence even on the next day's foreign equity flows in all 6 sample markets, which is consistent with our previous results.

Now we deal with the second part whether foreign equity investors in aggregate rebalance from the FX returns in EMs. Similarly, we estimate the following bivariate SVAR model of foreign equity flows and FX returns:

$$FXR_{i,t} = \alpha_{FXR} + \sum_{d=1}^{5}\phi_{1,1,d} * FXR_{i,t-d} + \sum_{d=1}^{5}\phi_{1,2,d} * NF_{i,t-d} + u_{i,t}^{FXR} \quad (3.3a)$$

$$NF_{i,t} = \alpha_{NF} + \sum_{d=0}^{5}\phi_{2,1,d} * FXR_{i,t-d} + \sum_{d=1}^{5}\phi_{2,2,d} * NF_{i,t-d} + u_{i,t}^{NF} \quad (3.3b)$$

$$\text{where} \begin{bmatrix} u_{i,t}^{FXR} \\ u_{i,t}^{NF} \end{bmatrix} \approx N\left[0,\ \mathbf{D}_i^{FXR,NF}\right],\ \mathbf{D}_i^{FXR,NF} = \begin{bmatrix} \sigma_{u,i,FXR}^2 & 0 \\ 0 & \sigma_{u,i,NF}^2 \end{bmatrix}$$

To make sure that the relationship between past FX returns and net flows is not just a proxy of the relationship between past equity local returns and net flows, we add five lags of equity local returns as an exogenous variable into the SVAR system as below:

$$FXR_{i,t} = \alpha_{FXR} + \sum_{d=1}^{5}\phi_{1,1,d} * FXR_{i,t-d} + \sum_{d=1}^{5}\phi_{1,2,d} * NF_{i,t-d} + \sum_{d=1}^{5}\phi_{1,3,d} * ELR_{i,t-d} + u_{i,t}^{FXR} \quad (3.4a)$$

$$NF_{i,t} = \alpha_{NF} + \sum_{d=0}^{5}\phi_{2,1,d} * FXR_{i,t-d} + \sum_{d=1}^{5}\phi_{2,2,d} * NF_{i,t-d} + \sum_{d=1}^{5}\phi_{2,3,d} * ELR_{i,t-d} + u_{i,t}^{NF} \quad (3.4b)$$

$$\text{where} \begin{bmatrix} u_{i,t}^{FXR} \\ u_{i,t}^{NF} \end{bmatrix} \approx N\left[0,\ \mathbf{D}_i^{FXR,NF}\right],\ \mathbf{D}_i^{FXR,NF} = \begin{bmatrix} \sigma_{u,i,FXR}^2 & 0 \\ 0 & \sigma_{u,i,NF}^2 \end{bmatrix}$$

Table 3.3 shows the results from the foreign equity flows equations for a bivariate SVAR of foreign equity flows and FX returns with no exogenous variable in Panel A, and with past equity local returns as an exogenous variable in Panel B, respectively. Like equity local returns, we also find a strong positive association between contemporaneous FX returns and foreign equity flows. However, the results about the effects of past FX returns on flows diverge in Panel A and Panel B. Excluding equity local returns, both estimated coefficients and Granger causality tests presented in Panel A suggest that past FX returns positively predict flows over and above the predictions of lagged flows from five out of six markets except JSX. For instance, in Panel A of Table 3.3, the estimated coefficients of one-day lagged FX returns for the five markets are strongly significant and ranging from 0.002 (Kospi, Kosdaq or PSE) to 0.006 (TWSE). Except JSX, the null hypothesis that Past FX returns do not Granger-cause flows are rejected in Granger causality test for other 5 markets at conventional 5% level (marginally rejected in TWSE).

However, this is no longer the case once we include equity local returns as an exogenous variable in our VAR framework. As it is shown in Panel B of Table 3.3, once the equity local returns are included, both the strong evidence from the estimated coefficients of one-day lagged FX returns and the Granger tests become insignificant. For instance, the estimated coefficients of one-day lagged FX returns becoming insignificant for all six markets in Panel B. Now the Granger tests can not reject the null hypothesis that past FX returns do not Granger-cause flows for all six markets at conventional level, while actually there is a substantial increase in every respective adjusted R^2 from Panel A to Panel B, invalidating the previous evidence in Panel A of Table 3.3. Clearly, past FX returns only serve as a proxy capturing the effects of past equity local returns on flows when past equity local returns are excluded. Once equity local returns are included, there is little effect of past FX returns on flows, but only the effects of past equity local returns on flows. Figure 3.2 shows the responses of flows to a one-standard deviation innovation in FX returns with equity local returns in its 5 lags as an exogenous variable based on equation (3.4b) using GIRFs. We find that past FX movements have an insignificant influence on flows in most of the cases, which further supports our previous estimates.

Overall, we find the net flows of all foreign investors respond positively to past equity local returns in our sample of six EMs, which is in contrast to the evidence of portfolio-rebalancing by U.S. equity investors in Curcuru et al. (2014).[31] But we find little evidence that foreign equity flows react to past currency movements, which is consistent with the very recent evidence of U.S. equity investors identified by Curcuru et al. (2014). The lack of sensitivity of foreign investors towards currency movements suggests that foreign equity investors in these six EMs only use FX as a vehicle (see, e.g., Goldberg and Tile, 2008; Devereux and Shi, 2013).

3.4.2 The motives behind the responses: Do foreign equity investors chase returns?

The above results are violating the first step and key driver of UEP (portfolio-rebalancing). As a result, it seems reasonable to attribute the failure of UEP in EMs (the positive correlation between equity local returns and FX returns in EMs) to the positive correlation between past equity local returns and foreign equity flows in EMs. Thus, as a natural next step, we ask the following questions: what is the exact motivation behind the positive responses of foreign equity investors to the shocks in past equity local returns? Is it return-chasing?

Literature has offered two hypotheses to explain the positive correlation between past equity local returns and foreign equity flows. The first one is the so-called "return-chasing" hypothesis, which indicates that foreign investors react to past positive returns with positive inflows in order to chase high expected returns

[31] The difference between our results and the results of Curcuru et al. (2014) may be due to the fact that they only consider the US investors but we consider all foreign investors in aggregate. Even if US investors are somewhat informed or pursue portfolio-rebalancing strategy (as found in Curcuru, et al., 2011, 2014), the foreigners from the other countries other than the US may still pursue a return-chasing strategy because of less information, momentum, sentiment or other reasons.

(Bohn and Tesar, 1996). This may arise because foreign investors extract information from past returns (Richards, 2005) if there is momentum in returns (Bekaert, et al., 2002).

The second hypothesis is what we term the macroeconomic news/sentiment hypothesis: Good (bad) news regarding the equity market leads to positive (negative) returns and to flows into (out of) equity markets (Ben-Rephael, et al., 2011).

We compare these two hypotheses in two ways. We first discuss the two hypotheses using the results we already obtained from the previous sub-section. If the return-chasing hypothesis dominates, there should be stronger forecasting power of the past equity local returns than the past FX returns on flows, as in the preliminary data analysis we find there is far less momentum in the FX returns which means that it is much more difficult for the investors to chase returns in the FX markets. If the macroeconomic news/sentiment hypothesis dominates, we conjecture that the past FX returns should have more forecasting power, as the FX markets are more liquid and easier to transmit news/sentiment (Bank for International Settlements, 2013). As we use the same flows series in equity and FX markets, the difference of results can only arise from the different properties of equity local returns and FX returns. The findings in the previous sub-section that the foreign equity flows respond to the past equity local returns (Table 3.2) but not to the past FX returns (Table 3.3), suggest a dominating role for the return-chasing hypothesis rather than the macroeconomic news/sentiment hypothesis.

However, one issue here is that investors may not extract information from past equity local returns to form expectations about future returns. Instead, there is a possibility that foreign investors may just react positively to past equity local returns but not future expected returns. For instance, Bekaert et al. (2002, p298) note that "high past returns need not signal high future returns, unless momentum is an important determinant of expected return".

As a result, we further verify the return-chasing hypothesis by decomposing the current equity local returns (FX returns) into an expected component and an unexpected component, and checking the explanatory power of both components on current flows. If the return-chasing hypothesis is dominating, we should find the expected component to have a far better explanatory power on flows than the unexpected component. Otherwise, it means that the macroeconomic news/sentiment hypothesis is dominating. It is not uncommon to see that macroeconomic news or sentiments to be denoted by the unexpected components of returns in literature. For instance, via a simple decomposition, Campbell (1991) show that the unexpected equity returns equal to cash flow news plus expected-return news. Similarly, Engle and Ng (1993) use an unexpected drop in returns as a proxy for bad news and an unexpected rise for good news. Although macroeconomic news or sentiment in returns may contain both an expected component and an unexpected component, it should be only the unexpected component which affects returns and flows (Ross et al., 1999).

We follow Richards (2005) and construct a series for "expected" returns on day t based on the return regressions in the VAR systems, using only variables predetermined up to day t-1, i.e., excluding same-day returns and flows, and a series for "unexpected" returns derived as actual returns less expected returns. The expected returns represent the information in past returns may be extracted by the foreign investors, and the unexpected returns represent the macroeconomic news or sentiment.[32]

To be specific, we use the following simple reduced-form VAR model with 5

[32] Our decomposition is plausible, but may not be the only way to distinguish the expected and the unexpected returns, or the return-chasing hypothesis and the macroeconomic news/sentiment hypothesis. We also decompose the returns by estimating a simple AR (1) model and take the predicted part as the expected returns and the residuals as unexpected returns, and get very similar results.

lags to obtain expected equity local returns and unexpected equity local returns.

$$\mathrm{NF}_{i,t} = \alpha_{\mathrm{NF}} + \sum_{d=1}^{5}\phi_{1,1,d} * \mathrm{NF}_{i,t-d} + \sum_{d=1}^{5}\phi_{1,2,d} * \mathrm{ELR}_{i,t-d} + \varepsilon_{i,t}^{\mathrm{NF}} \quad (3.5a)$$

$$\mathrm{ELR}_{i,t} = \alpha_{\mathrm{ELR}} + \sum_{d=1}^{5}\phi_{2,1,d} * \mathrm{NF}_{i,t-d} + \sum_{d=1}^{5}\phi_{2,2,d} * \mathrm{ELR}_{i,t-d} + \varepsilon_{i,t}^{\mathrm{ELR}} \quad (3.5b)$$

$$\text{where } \begin{bmatrix} \varepsilon_{i,t}^{\mathrm{NF}} \\ \varepsilon_{i,t}^{\mathrm{ELR}} \end{bmatrix} \approx \mathrm{N}\left[0,\ \Sigma_i^{\mathrm{NF,ELR}}\right],\ \Sigma_i^{\mathrm{NF,ELR}} = \begin{bmatrix} \sigma_{\varepsilon,i,\mathrm{NF}}^2 & \rho_{i,\mathrm{NF,ELR}}\sigma_{\varepsilon,i,\mathrm{NF}}\sigma_{\varepsilon,i,\mathrm{ELR}} \\ \rho_{i,\mathrm{NF,ELR}}\sigma_{\varepsilon,i,\mathrm{NF}}\sigma_{\varepsilon,i,\mathrm{ELR}} & \sigma_{\varepsilon,i,\mathrm{ELR}}^2 \end{bmatrix}$$

Similarly, we use the following simple reduced-form VAR model with 5 lags to obtain expected FX returns and unexpected FX returns.

$$\mathrm{NF}_{i,t} = \alpha_{\mathrm{NF}} + \sum_{d=1}^{5}\phi_{1,1,d} * \mathrm{NF}_{i,t-d} + \sum_{d=1}^{5}\phi_{1,2,d} * \mathrm{FXR}_{i,t-d} + \varepsilon_{i,t}^{\mathrm{NF}} \quad (3.6a)$$

$$\mathrm{FXR}_{i,t} = \alpha_{\mathrm{FXR}} + \sum_{d=1}^{5}\phi_{2,1,d} * \mathrm{NF}_{i,t-d} + \sum_{d=1}^{5}\phi_{2,2,d} * \mathrm{FXR}_{i,t-d} + \varepsilon_{i,t}^{\mathrm{FXR}} \quad (3.6b)$$

$$\text{where } \begin{bmatrix} \varepsilon_{i,t}^{\mathrm{NF}} \\ \varepsilon_{i,t}^{\mathrm{FXR}} \end{bmatrix} \approx \mathrm{N}\left[0,\ \Sigma_i^{\mathrm{NF,FXR}}\right],\ \Sigma_i^{\mathrm{NF,FXR}} = \begin{bmatrix} \sigma_{\varepsilon,i,\mathrm{NF}}^2 & \rho_{i,\mathrm{NF,FXR}}\sigma_{\varepsilon,i,\mathrm{NF}}\sigma_{\varepsilon,i,\mathrm{FXR}} \\ \rho_{i,\mathrm{NF,FXR}}\sigma_{\varepsilon,i,\mathrm{NF}}\sigma_{\varepsilon,i,\mathrm{FXR}} & \sigma_{\varepsilon,i,\mathrm{fxr}}^2 \end{bmatrix}$$

After obtaining the expected and the unexpected equity local returns from model (3.5), we substitute the equity local returns in model (3.1) and (3.2) with its (un)expected component and re-estimate the model (3.1) and (3.2) to quantify the effects of its (un)expected equity local returns on foreign equity flows. The results are presented in Table 3.4. Similarly, we substitute the FX returns in model (3.3) and (3.4) with its expected and unexpected FX components obtained from model (3.6) to quantify the effects of the expected and the unexpected FX returns on foreign capital flows, with the results presented in Table 3.5.

Table 3.4 shows the results of explanatory power of the expected (unexpected) equity local returns on foreign equity flows in Panel A (Panel B), respectively. Clearly, flows are affected by both the expected and unexpected equity local returns according to the statistical significance of estimated coefficients of returns (the only exception is TWSE). More importantly, in terms of economic significance, in every case the magnitude of the effect from the expected component is much bigger than the one from the unexpected equity local returns. For instance, in the results from the simple bivariate VAR with no exogenous variable on the left-hand-side of Table 3.4, the estimated coefficients of the expected contemporaneous returns in Panel A range from 0.008 (PSE) to 0.172 (SET), roughly 10 times as much for the ones of the unexpected return in Panel B ranging from 0.001 (PSE) to 0.014 (TWSE), which attribute the major part of the effects of the past equity local returns on flows, to the expected returns rather than the unexpected returns associated with macroeconomic news or sentiment. When we include past FX returns as an exogenous variable, we find similar results which are reported on the right-hand-side of Table 3.4.

Similarly, Table 3.5 shows the results of explanatory power of expected (unexpected) FX returns on foreign equity flows in Panel A (Panel B), respectively. According to the statistical significance, flows are positively affected by the unexpected FX returns in every case, and the magnitude of coefficients is comparable to the ones of coefficients of unexpected equity local returns in Table 3.5. That is to say, flows are affected by unexpected FX returns as well as the unexpected equity local returns, although the magnitude of the effects from both of them is relatively small. It makes sense as the macroeconomic news/sentiment hypothesis should also work in FX markets if it works in the domestic equity markets. However, in stark contrast, we find little evidence that flows are affected by the expected FX returns (only in TWSE and SET). It may not be surprising to find that flows do not chase returns in FX markets given the fact that FX returns are notoriously difficult to forecast. Overall, we conclude the main explanation for the effects of past equity local returns on flows is the return-chasing hypothesis.[33]

3.4.3 The second step of UEP: Do foreign equity flows cause FX returns?

Preliminary data analysis also suggests a positive contemporaneous correlation between foreign equity flows and FX returns in our sample of six EMs. However, it is unclear whether it is only a contemporaneous relationship, or an inter-temporal relationship (e.g., foreign equity flows predict FX returns over and above the predictions of lagged FX returns). Using monthly data, Curcuru et al. (2014) "do not know the timing of purchases within a month and so cannot perfectly disentangle" a contemporaneous relationship from an inter-temporal relationship, as the inter-temporal changes in variables within the month are netted out. Our data set in daily frequency is in a much better position regarding this question.

To examine the second step of UEP whether foreign equity flows cause FX returns in the same direction in EMs, we estimate the following bivariate SVAR, which is in line with the previous literature on flows and exchange rates such as Hau and Rey (2004), Froot and Ramadorai (2005) and Love and Payne (2008), and focus on the FX returns equation from now onwards:

$$\mathrm{NF}_{i,t} = \alpha_{\mathrm{NF}} + \sum_{d=1}^{5} \phi_{1,1,d} * \mathrm{NF}_{i,t-d} + \sum_{d=1}^{5} \phi_{1,2,d} * \mathrm{FXR}_{i,t-d} + u_{i,t}^{\mathrm{NF}} \tag{3.7a}$$

$$\mathrm{FXR}_{i,t} = \alpha_{\mathrm{FXR}} + \sum_{d=0}^{5} \phi_{2,1,d} * \mathrm{NF}_{i,t-d} + \sum_{d=1}^{5} \phi_{2,2,d} * \mathrm{FXR}_{i,t-d} + u_{i,t}^{\mathrm{FXR}} \tag{3.7b}$$

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[33] We try to replicate Table 4 in page 10 of Richards (2005) but include both realized and implied global equity volatility and FX volatility obtained from hourly data. While we find that both the past global equity and FX volatility have a negative effect on flows into EMs, the explanatory power of past global equity/FX volatilities cannot be beat past equity local returns. Consistent with Richards (2005), we find the best explanatory power comes from previous day's Nasdaq returns for Kosdaq and TWSE, previous day's Philadelphia Semiconductor Index returns for Kospi, domestic returns for the rest three markets, which suggests foreign investors also extract information from the markets outside of the EMs.

$$\text{where} \begin{bmatrix} u_{i,t}^{NF} \\ u_{i,t}^{FXR} \end{bmatrix} \approx N\left[0, \mathbf{D}_i^{NF,FXR}\right], \ \mathbf{D}_i^{NF,FXR} = \begin{bmatrix} \sigma_{u,i,NF}^2 & 0 \\ 0 & \sigma_{u,i,FXR}^2 \end{bmatrix}$$

To make sure that the relationship between net flows and FX returns is not just a proxy of the relationship between net flows and equity local returns, we add five lags of equity local returns as an exogenous variable into the SVAR system as below:

$$NF_{i,t} = \alpha_{NF} + \sum_{d=1}^{5}\phi_{1,1,d} * NF_{i,t-d} + \sum_{d=1}^{5}\phi_{1,2,d} * FXR_{i,t-d} + \sum_{d=1}^{5}\phi_{1,3,d} * ELR_{i,t-d} + u_{i,t}^{NF} \qquad (3.8a)$$

$$FXR_{i,t} = \alpha_{FXR} + \sum_{d=0}^{5}\phi_{2,1,d} * NF_{i,t-d} + \sum_{d=1}^{5}\phi_{2,2,d} * FXR_{i,t-d} + \sum_{d=1}^{5}\phi_{2,3,d} * ELR_{i,t-d} + u_{i,t}^{FXR} \qquad (3.8b)$$

$$\text{where} \begin{bmatrix} u_{i,t}^{NF} \\ u_{i,t}^{FXR} \end{bmatrix} \approx N\left[0, \mathbf{D}_i^{NF,FXR}\right], \ \mathbf{D}_i^{NF,FXR} = \begin{bmatrix} \sigma_{u,i,NF}^2 & 0 \\ 0 & \sigma_{u,i,FXR}^2 \end{bmatrix}$$

The results for the FX returns equation from the bivariate SVAR without exogenous variable and with equity local returns as an exogenous variable are shown in Panel A and Panel B of Table 3.6, respectively. We report the estimates of the contemporaneous net flows and the past net flows up to 5 lags, adjusted R^2 and the p-value of Granger causality test for the hypothesis: Past flows do not Granger-cause FX returns. In general, the results from Panel A and Panel B are similar. From estimated coefficients of flows, we can see that flows have an overall positive influence on FX returns, as the sum of the coefficients of both contemporaneous and past foreign equity flows are always positive. However, most of the positive influence comes from the contemporaneous flows, with the estimated coefficient ranging from 1.831 (SET) to 3.908 (JSX) in Panel A, and from 1.688 (SET) to 3.811 (Kospi). There are slight reversals as there are some negative coefficients of past flows sometimes. The adjusted R^2 ranges from 0.009 (PSE) to 0.116 (TWSE) in Panel B, which is no less to the explanatory power of currency order flows in the existing literature (e.g., from 0.0036 (GBP/EUR) to 0.006 (USD/EUR) in Table 5 of

Love and Payne, 2008). The Granger-causality tests reject the null hypothesis that past flows do not Granger-cause current FX returns for half of our sample countries at 15% level (Indonesia, Taiwan and Thailand)[34]. In other words, we find a strong contemporaneous positive relationship between foreign equity flows and FX returns, and a weak inter-temporal relationship which implies that foreign equity flows may also have a positive and permanent impact on future FX returns.

Figure 3.3 presents the responses of FX returns to a one-standard-deviation innovation in foreign equity flows using general impulse response functions (GIRFs). We only report the results based on equation (3.8b), as the results based on equation (3.8a) are similar. Except Indonesia (JSX), we cannot find substantial reversals in the other 5 EMs. We find that the responses of FX returns become insignificant from the next trading day for Indonesia (JSX), Korea (Kospi), Korea (Kosdaq) and Philippines (PSE) but last for almost one week for Taiwan (TWSE) and Thailand (SET). More important, over a 10-day period, we find that the median cumulative response on FX returns of a one-standard-deviation shock in foreign net flows is 3.86% based on equation (3.7b) and 4.16% based on equation (3.8b), which means that it is not only statistically significant but also economically significant. Overall, our results strongly support the second step of UEP: foreign equity flows have a strong positive and significant influence on FX returns.

3.5 Comparison with other explanations

In this section, we discuss other explanations of the failure of UEP proposed in the existing studies and compare them with our return-chasing explanation. To the best

[34] The weak evidence may be due to the information loss in net equity flows. Compared to order flows, net equity flows have no information about the signs of the trade, i.e., the initiated side of the trades.

of our knowledge, we are only aware of the following two other explanations[35]: 1) market risk (Kim, 2011), and 2) flight-to-quality (Cho et al., 2014).

Using data for 4 EMs (Singapore, Korea, Malaysia and Thailand), Kim (2011) argue that the positive correlation between FX and equity local returns in EMs might be explained by market risks in EMs, due to "incomplete institutional reforms, weaker macroeconomic fundamentals, more volatile economic conditions, shallow financial markets and imperfect market integration". We hold the belief that market risk may not be enough to fully explain the failure of UEP in our sample of six EMs, for the following three reasons.

First of all, it is less intuitive how can market risks affect the sign of the corrections between FX and equity local returns. It is more likely that market risks affect the magnitude rather than the sign of the correlations, such as in the case of Cho et al. (2014).

Moreover, we find an obvious upward time trend in the 250-trading-day (one calendar year) moving correlations between equity local returns and FX returns in six EMs in Figure 3.4, while Kim (2011, p1492) suggests that the magnitude of the correlation coefficients should have decreased, as "the market risk after the liberalization of financial markets is expected to decrease gradually along the path of market integration". Appendix A shows that the upward trend does not change no matter we calculate 125-trading-day (half a year), 63-trading-day (one calendar quarter) or 21-trading-day (one calendar month) moving correlations. However, the upward supports our return-chasing explanation as it has become increasingly safer and easier for the foreign investors to chase returns along the path of market integration.

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[35] In the latest version, Cenedese et al. (2014) find that global equity volatility risk can only partially explain the cross-sectional failure of UEP, which motives our further robustness tests controlling for VIX and/or other global shocks.

Finally, Kim (2011) suggests that the magnitude of the correlations in relatively more developed EMs (Singapore and Korea), which is generally associated with less market risks, should be smaller than the ones in relatively less developed EMs (Malaysia and Thailand). However, over the full sample we find in the preliminary analysis that the magnitude of the correlation coefficients in the relatively more developed EMs such as Kospi, Kosdaq and TWSE (0.30, 0.29 and 0.31, respectively) are larger than in the relatively less developed EMs such as JSX, PSE and SET (0.20, 0.24 and 0.20, respectively)[36]. Again, this fact supports our return-chasing explanation as the relatively more developed EMs are more attractive to the foreign investors in terms of chasing returns.

Cho et al. (2014) propose the flight-to-quality phenomenon as an explanation of the positive correlation between quarterly FX and equity local returns, as “When we partition the sample into up markets and down markets, we find that net capital flows are sensitive to overall stock market conditions only in down markets, consistent with the flight-to-quality arguments”.

In order to distinguish from flight-to-quality, we follow Cho et al. (2014) and partition our sample of daily data into global up (when the returns of MSCI World index is positive) and down (when the returns of MSCI World index is negative) periods but find both positive correlations between flows and local equity returns, and between FX and equity local returns in global up periods as well as in global down periods in the four two columns of Panel A of Table 3.7. Alternatively, we redefine global up markets as the period when the local equity returns and the returns of MSCI EM index is positive and global down markets as the period when the local

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[36] In fact, Richards (2005, p5) documents that the annual turnover ratio (the annual turnover divided by the previous day’s market capitalization) in Kospi, Kosdaq and TWSE (is 2.32, 9.85 and 2.08, respectively), is much higher than JSX, PSE and SET (0.38, 0.07 and 1.05, respectively), while the same ratio is only 0.89 for New York Stock Exchange in 2001. We confirm this result using recent data.

equity returns or the returns of MSCI EM index is negative, and find similar results in the later four columns of Panel A of Table 3.7.

In order to not shatter the continuity of our sample, in Panel B of Table 3.7, we further divide our sample into an earlier Asian Financial Crisis and Dotcom Crisis subsample (from various starting date to Oct 9, 2002), a non-crisis subsample (from Oct 9, 2002 to Aug 9, 2007), and a recent Global Financial Crisis subsample (from Aug 9, 2007 to Dec 30, 2013) and find similar results. As a result, we conclude that our results do not fully rely on flight-to-quality and our explanation applies in general.

3.6 Robustness tests

In this section, we discuss the robustness of our analysis. In particular, we consider the following four possible concerns: 1) the model reliability, 2) using return differentials, 3) the changes in financial wealth, and 4) the regional co-movement effect.

One concern of our analysis is the reliability of our estimates. We first perform the following robustness tests: using flows without winsorization, or using 1-day lagged flow data. We also introduce S&P 500 returns, or Nasdaq returns, or Philadelphia Semiconductor index returns as in Richards (2005), or proxies for global developed market information (MSCI World index returns), global emerging market information (MSCI EM index returns) and global risk appetite (VIX) as Ulku and Weber (2014) into our VAR models once a time as control variables. As shown from Panel A to Panel H in Appendices from 3B to 3H, all key results stay, essentially, unchanged. Our results are also robust to various combinations of different control variables, alternative order of variables and alternative number of lags, but we do not report the results for space constraints.

Another concern arises because we use raw returns and Hau and Rey (2006) use return differentials between U.S. and foreign stock indices. While Hau and Rey (2006) build their theory in a world with two countries and an exogenous setting of portfolio-rebalancing regarding return differentials, there are more than two countries in this real world and it is not straight forward which country should be used as the benchmark (Richards, 2005, p8), especially when we focus on all the foreign investors rather than only the investors from the U.S. [37] As it is shown in Panel C of Table 3.7, we find positive and significant correlations between flows and equity returns differentials, and between FX returns and equity return differentials in most of the cases when we use different benchmarks (S&P 500, Nasdaq, Philadelphia Semiconductor index, MSCI world index, MSCI EM index) to construct equity returns differentials. In particular, we find three negative and significant correlations between FX returns and equity returns differentials when we use MSCI EM index to construct equity returns differentials, which is probably due to some kind of portfolio-rebalancing regarding the MSCI EM returns. [38]

Since we use flow data rather than portfolio data, like most of the literature, our analysis is also subject to the critique from Curcuru et al. (2011): flow data are influenced by changes in financial wealth. Like most of the literature about the interaction between international capital flows and domestic equity returns (Froot et al., 2001; Griffin et al., 2004; Richard, 2005), we scaled our flow data by local equity market capitalization in our main analysis. Alternatively, we also try to control for the changes in financial wealth of investors by normalizing our flows variable by

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[37] For instance, Kim (2011) finds significant different results using Japan rather than the U.S. as a benchmark economy. Cho et al. (2014) also find significant different results once Japan is included.

[38] For instance, Richards (2005, p8) explicitly points out: "Much investment in emerging markets occurs not via managers with a global mandate but rather via specialist managers investing only in emerging markets. Hence if portfolio rebalancing effects are important, the relevant return might not be a global mature markets return, but rather the return on a basket of emerging market equities." See also the relevant references cited by Richards (2005).

trading volume instead of local equity market capitalization, or scaling flows by the average of absolute flows of previous 21/63/125 trading days. As shown from Panel I to Panel L in Appendices from 3B to 3H, all key results stay unchanged.

Since our six sample countries are geographically close, there might be a common regional effect behind the flows and returns. In unreported results, we have found strong co-movements in flows, FX returns and equity local returns, with the average correlation coefficients between net flows into different markets of approximately 0.21, while the average correlation coefficients of FX returns and equity local returns between different markets are 0.33 and 0.47, respectively. In an unreported principal component analysis, we find that the first principal component is able to explain 36%, 47% and 56% of the variations in net flows, FX returns and equity local returns, respectively, which suggests that there are regional/global co-movements within flows, FX returns and equity local returns. We take the co-movements into account by employing the fixed-effect panel-VAR regression[39]. Generally, all previous results are confirmed by the panel-VAR approach. In Figure 3.5, we find foreign equity flows have significant positive influence on FX returns, and equity local returns have a significant positive influence on future foreign equity flows. However, the influence of equity local returns on future FX returns, and the influence of FX returns on future foreign equity flows are insignificant.

3.7 Conclusion

Within the portfolio-rebalancing framework, UEP suggests that the equity local returns and FX returns are negatively correlated. Motived by the failure of UEP in EMs, this paper examines the mechanisms underlying UEP as well as its prediction, using daily foreign equity flows, equity local returns and FX returns data for six

[39] As there are many more observations over time than across countries in our study, we prefer using a fixed-effect panel-VAR regression to Arellano-Bond estimation in the dynamic panel.

Asian markets from the 1990s to 2013. Previous literature either only investigates the mechanisms underlying UEP (Curcuru et al., 2014), or only examines its prediction (Kim, 2011; Cho et al., 2014; Cenedese et al., 2014). We find evidence unsupportive of some mechanisms underlying UEP. For example, we find little evidence that foreign equity investors in aggregate react to currency movements, suggesting that foreign investors in aggregate in EMs mainly use exchange rates as a vehicle (e.g., Goldberg and Tile, 2008; Devereux and Shi, 2013), which is consistent with the evidence found in Curcuru et al. (2014) for U.S. equity investors. Furthermore, foreign equity investors in aggregate pursue a return-chasing rather than portfolio-rebalancing strategy regarding equity local returns in EMs, which leads to a positive correlation between the equity local returns and FX returns in EMs. However, we do find strong support for the rest of UEP: we find a strong contemporaneous positive relationship between foreign equity flows and FX returns, and a weak inter-temporal relationship which implies that foreign equity flows may also have a positive and permanent impact on future FX returns.

The main contribution of this paper is that we unveil another side of the UEP: UEP does not automatically guarantee a negative correlation between equity local returns and FX returns. Instead, UEP provides one explanation of the relationship but may not be the only one. The relationship between FX and equity local returns hinges on the overall behavior of foreign equity investors in aggregate, i.e., whether they pursue a portfolio-rebalancing or return-chasing strategy. The former predicts a negative correlation, while the latter creates a positive correlation between FX and equity local returns. In other words, we reconcile the mixed evidence on the prediction of UEP about the correlation between FX and equity local returns in previous literature. By doing so, we contribute to the notoriously difficult question on the prediction of FX movements.

Our results are complementary rather than contradictory to the previous literature on UEP. In particular, we find that foreign equity investors in aggregate pursue a return-chasing strategy, but we do not exclude the possibility that a specific group of investors such as the U.S. equity investors might pursue a portfolio-rebalancing strategy regarding equity local returns in EMs, which is of course possible, so long as they form a small part of the total number of foreign investors. It is also possible that the foreign equity investors pursue a portfolio-rebalancing strategy regarding equity local returns in developed markets, which we are refrained from commenting due to data limitation.

The findings of this paper have important implications for policy-makers, academics and investors. For policy-makers in EMs, they should not only pay attention to the equity markets when there are net foreign equity flows, but also to the FX markets as foreign equity flows have a positive influence on FX markets as well. For academics, we show that there is some association between the movements in equity and FX markets, but the mechanisms underlying it are not clear, which is a fruitful future research direction. For instance, there is a possibility that equity local returns and FX returns are uncorrelated, if all foreign investors in aggregate do not react to the movement in equity local returns. For investors, our results suggest that the FX hedging strategy might be helpful to foreigners' equity investments in EMs, as FX movements do not offset equity local return but add additional risks to the total portfolio returns in EMs.

Table 3.1 Descriptive statistics.

This table provides descriptive statistics of the three main economic variables, i.e.: net flows (NF_{it}), equity local returns (ELR_{it}) and FX returns (FXR_{it}) in daily frequency for six equity markets from various starting dates to the end of 2013. Net flows are defined as (buy value) - (sell value) by foreign investors, scaled by previous day's market capitalization. Equity prices are expressed in local currency and both equity local returns and FX returns are in percentage terms. For each country the table shows the starting date of the sample, the mean, median, and standard deviation of net flows and returns, the first five autocorrelation estimates for each series, and the contemporaneous correlation between net flows and equity local returns, equity local returns and FX returns, and net flows and FX returns, respectively. The end date for all countries is December 30, 2013. * and bold mean that the correlation coefficient is significant at the 5% level or better here.

Country	Start Date		Mean	Median	Std.Dev.	lag 1	lag 2	lag 3	lag 4	lag 5	corr(NF*ELR)	corr(ELR*FXR)	corr(NF*FXR)
		NF	0.006	0.002	0.026	**0.18***	0.11	0.09	0.09	0.06			
Indonesia (JSX)	Sept. 9, 1996	ELR	0.049	0.100	1.696	**0.14***	0.02	-0.03	-0.02	-0.02	**0.29***	**0.20***	**0.05***
		FXR	-0.039	0.000	1.724	-0.02	0.08	-0.01	-0.03	-0.03			
		NF	0.004	0.001	0.039	**0.48***	**0.32***	**0.26***	**0.23***	**0.22***			
Korea (Kospi)	Jun. 30, 1997	ELR	0.024	0.086	1.942	**0.06***	-0.04	-0.02	-0.04	-0.04	**0.31***	**0.30***	**0.11***
		FXR	-0.004	0.022	1.054	0.02	**-0.10***	-0.01	**-0.07***	**-0.11***			
		NF	0.003	0.001	0.029	**0.42***	**0.26***	**0.22***	**0.22***	**0.20***			
Korea (Kosdaq)	Mar. 15, 1999	ELR	-0.013	0.130	2.053	**0.14***	0.04	0.03	0.02	-0.02	**0.19***	**0.29***	**0.08***
		FXR	0.004	0.026	0.716	-0.02	0.03	-0.04	0.02	-0.03			
		NF	0.001	0.000	0.013	**0.17***	**0.14***	**0.11***	**0.10***	**0.08***			
Philippines (PSE)	Mar. 15, 1999	ELR	0.031	0.035	1.384	**0.12***	0.00	-0.04	-0.02	-0.04	**0.17***	**0.24***	**0.06***
		FXR	-0.004	0.000	0.446	-0.03	-0.04	0.03	-0.04	-0.01			
		NF	0.006	0.006	0.040	**0.51***	**0.33***	**0.26***	**0.22***	**0.18***			
Taiwan (TWSE)	Jan. 1, 2001	ELR	0.019	0.053	1.413	**0.05***	0.02	0.01	-0.01	-0.02	**0.51***	**0.31***	**0.32***
		FXR	0.003	0.000	0.265	0.03	0.02	-0.01	0.02	**0.06***			
		NF	0.001	0.000	0.030	**0.56***	**0.38***	**0.29***	**0.25***	**0.21***			
Thailand (SET)	Dec. 1, 1997	ELR	0.031	0.034	1.641	**0.07***	**0.05***	0.00	-0.01	0.00	**0.37***	**0.20***	**0.13***
		FXR	0.006	0.000	0.529	**0.12***	-0.03	**-0.05***	0.02	**0.11***			

Table 3.2 Explanatory power of equity local returns on foreign equity flows.

This table shows the results from the flows equations for a bivariate structural vector autoregressive models (SVAR) of foreign equity flows and equity local returns (ELR) with no exogenous variable in Panel A, and with FX returns as an exogenous variable in Panel B, respectively. The VAR is structural as we include contemporaneous equity local returns in the flows equation. The SVARs are estimated separately for each country with five lags. The L. is the lag operator. We report t-statistics computed using maximum likelihood estimates of covariance matrix in parentheses, while *, ** and *** indicates statistical significance at the 10%, 5% and 1% level, respectively. We report adjusted R2 and the p-values of Granger causality test for the hypothesis: Past equity local returns do not Granger-cause flows.

	Panel A: Without exogenous variable						Panel B: With past FX returns as an exogenous variable					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
EquityLocalReturns	0.004***	0.005***	0.002***	0.001***	0.014***	0.006***	0.004***	0.005***	0.002***	0.001***	0.014***	0.006***
	(18.88)	(21.91)	(10.13)	(10.03)	(38.73)	(26.12)	(18.83)	(21.98)	(10.23)	(9.91)	(38.69)	(25.96)
L.EquityLocalReturns	**0.002*** **	**0.005*** **	**0.002*** **	**0.001*** **	**0.004*** **	**0.004*** **	**0.002*** **	**0.005*** **	**0.002*** **	**0.001*** **	**0.004*** **	**0.004*** **
	(8.25)	(18.00)	(8.44)	(7.60)	(8.39)	(19.09)	(8.34)	(17.92)	(8.16)	(7.55)	(8.31)	(18.60)
L2.EquityLocalReturns	0.001**	-0.001***	-0.001***	0.001***	0.001	-0.001***	0.001**	-0.001***	-0.001***	0.001***	0.001	-0.001***
	(2.20)	(-3.91)	(-6.33)	(3.48)	(1.37)	(-3.53)	(2.52)	(-3.46)	(-5.38)	(3.43)	(1.40)	(-3.59)
L3.EquityLocalReturns	0.000	-0.000	-0.001***	0.000***	0.001	-0.001***	0.000	-0.000	-0.001***	0.000***	0.001	-0.001***
	(1.23)	(-0.96)	(-2.99)	(3.22)	(1.18)	(-2.99)	(1.39)	(-0.56)	(-3.13)	(3.10)	(1.60)	(-2.91)
L4.EquityLocalReturns	-0.001**	-0.000	-0.000	0.000	-0.000	-0.001***	-0.000**	-0.000	-0.000	0.000*	-0.000	-0.001***
	(-2.42)	(-1.15)	(-0.45)	(1.56)	(-0.75)	(-4.20)	(-2.07)	(-1.06)	(-0.11)	(1.79)	(-0.86)	(-3.96)
L5.EquityLocalReturns	-0.000	-0.000	-0.000	0.000	-0.000	-0.001***	-0.000	-0.000*	-0.000	0.000	-0.001	-0.001***
	(-0.33)	(-1.45)	(-1.01)	(0.61)	(-1.15)	(-3.39)	(-0.38)	(-1.73)	(-1.07)	(0.68)	(-1.30)	(-3.13)
Adj. R2	0.149	0.391	0.252	0.105	0.516	0.479	0.149	0.391	0.253	0.104	0.516	0.479
Granger	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Table 3.3 Explanatory power of FX returns on foreign equity flows.

This table shows the results from the flows equations for a bivariate structural vector autoregressive models (SVAR) of foreign equity flows and FX returns (FXR) with no exogenous variable in Panel A, and with equity local returns as an exogenous variable in Panel B, respectively. The VAR is structural as we include contemporaneous FX returns in the flows equation. Both SVARs are estimated separately for each country with five lags. The L. is the lag operator. We report t-statistics computed using maximum likelihood estimates of covariance matrix in parentheses, while *, ** and *** indicates statistical significance at the 10%, 5% and 1% level, respectively. We report adjusted R2 and the p-values of Granger causality test for the hypothesis: Past FX returns do not Granger-cause flows.

	Panel A: Without exogenous variable						Panel B: With past equity local returns as an exogenous variable					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
FXReturns	0.001***	0.004***	0.003***	0.002***	0.042***	0.004***	0.001***	0.004***	0.003***	0.002***	0.042***	0.004***
	(3.75)	(6.97)	(4.59)	(3.76)	(19.45)	(5.47)	(2.83)	(7.61)	(4.96)	(3.85)	(19.64)	(4.83)
L.FXReturns	**0.000**	**0.002*** **	**0.002*** **	**0.002*** **	**0.006** **	**0.003*** **	**-0.000**	**-0.000**	**0.000**	**0.001**	**0.003**	**0.001* **
	(0.61)	(4.78)	(3.22)	(3.46)	(2.45)	(4.32)	(-1.64)	(-0.76)	(0.31)	(1.41)	(1.38)	(1.79)
L2.FXReturns	-0.000	0.000	-0.002***	0.001	0.002	-0.000	-0.000*	0.001	-0.001**	-0.000	0.001	-0.000
	(-1.56)	(0.97)	(-2.85)	(1.50)	(0.97)	(-0.47)	(-1.95)	(1.12)	(-1.99)	(-0.94)	(0.55)	(-0.31)
L3.FXReturns	-0.000	-0.001	-0.000	0.001*	-0.004*	-0.001	-0.000	-0.001*	0.000	0.000	-0.005**	0.000
	(-0.21)	(-1.45)	(-0.21)	(1.86)	(-1.72)	(-1.20)	(-0.05)	(-1.79)	(0.58)	(0.54)	(-2.03)	(0.06)
L4.FXReturns	-0.000	-0.001	-0.001	0.000	0.000	-0.000	-0.000	0.000	-0.001	-0.000	0.000	0.000
	(-1.33)	(-1.31)	(-1.12)	(0.43)	(0.16)	(-0.03)	(-1.02)	(0.10)	(-0.83)	(-0.52)	(0.03)	(0.14)
L5.FXReturns	-0.000	-0.000	-0.000	0.000	-0.001	-0.002***	-0.000	0.000	0.000	-0.000	-0.000	-0.002**
	(-0.45)	(-0.01)	(-0.26)	(0.21)	(-0.30)	(-2.66)	(-0.44)	(0.36)	(0.23)	(-0.34)	(-0.09)	(-2.50)
Adj. R2	0.052	0.271	0.212	0.061	0.356	0.339	0.079	0.328	0.236	0.084	0.367	0.393
Granger	0.392	0.000	0.001	0.005	0.073	0.000	0.168	0.391	0.371	0.577	0.273	0.096

Table 3.4 Explanatory power of expected and unexpected equity local returns on foreign equity flows.

This table shows the results from the flows equations for a bivariate structural vector autoregressive models (SVAR) of foreign equity flows and expected (unexpected) equity local returns without (with) FX returns as an exogenous variable in Panel A (Panel B). The VAR is structural as we include contemporaneous expected (unexpected) equity local returns in the flows equation. The SVAR is estimated separately for each country with five lags. The L. is the lag operator. We report maximum likelihood estimates of t-statistics in parentheses, while *, ** and *** indicates statistical significance at the 10%, 5% and 1% level, respectively. We report adjusted R^2 and the p-values of Granger causality test for the hypothesis: Past expected (unexpected) equity local returns do not Granger-cause flows.

	Without exogenous variable						With past FX returns as an exogenous variable					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
	Panel A: Flows equations with expected equity local returns											
ExpectedEquityLocalReturns	**0.017*** **	**0.036*** **	**0.016*** **	**0.008*** **	**0.041* **	**0.172*** **	**0.018*** **	**0.036*** **	**0.016*** **	**0.008*** **	**0.041* **	**0.167*** **
	(10.83)	(13.81)	(9.72)	(7.32)	(1.68)	(18.99)	(10.92)	(13.05)	(9.25)	(6.79)	(1.66)	(18.27)
L.ExpectedEquityLocalReturns	0.004**	-0.001	-0.011***	0.004***	0.005	-0.056***	0.004***	-0.002	-0.010***	0.004***	0.007	-0.055***
	(2.27)	(-0.51)	(-6.34)	(3.20)	(0.21)	(-6.06)	(2.61)	(-0.84)	(-5.51)	(3.09)	(0.27)	(-5.97)
L2.ExpectedEquityLocalReturns	0.006***	-0.002	-0.007***	0.004***	0.021	0.052***	0.006***	-0.002	-0.007***	0.004***	0.021	0.050***
	(3.41)	(-0.79)	(-4.00)	(4.02)	(1.20)	(5.36)	(3.49)	(-0.64)	(-4.09)	(3.63)	(1.19)	(5.14)
L3.ExpectedEquityLocalReturns	-0.001	0.000	-0.001	0.003***	-0.017	0.005	0.000	0.000	-0.001	0.003***	-0.015	0.004
	(-0.35)	(0.17)	(-0.79)	(2.59)	(-1.43)	(0.56)	(0.03)	(0.09)	(-0.57)	(2.60)	(-1.33)	(0.40)
L4.ExpectedEquityLocalReturns	0.004***	0.009***	0.003*	0.003***	0.006	-0.020***	0.005***	0.009***	0.003	0.003***	0.005	-0.019***
	(2.73)	(3.58)	(1.89)	(2.99)	(0.58)	(-3.69)	(2.79)	(3.56)	(1.63)	(2.77)	(0.48)	(-3.47)
L5.ExpectedEquityLocalReturns	-0.001	0.004*	-0.001	0.003**	0.007	0.006**	-0.001	0.005**	-0.001	0.003**	0.007	0.006**
	(-0.54)	(1.79)	(-0.74)	(2.39)	(0.84)	(2.34)	(-0.60)	(2.18)	(-0.65)	(2.44)	(0.81)	(2.32)
Adj. R2	0.079	0.292	0.231	0.075	0.279	0.389	0.079	0.280	0.231	0.068	0.280	0.356
Granger	0.000	0.002	0.000	0.000	0.548	0.000	0.000	0.020	0.000	0.000	0.487	0.421
	Panel B: Flows equations with unexpected equity local returns											
UnexpectedEquityLocalReturns	**0.004*** **	**0.005*** **	**0.002*** **	**0.001*** **	**0.014*** **	**0.006*** **	**0.004*** **	**0.005*** **	**0.002*** **	**0.001*** **	**0.014*** **	**0.006*** **
	(18.89)	(21.91)	(10.15)	(9.99)	(38.79)	(26.77)	(18.84)	(21.99)	(10.25)	(9.87)	(38.76)	(26.62)
L.UnexpectedEquityLocalReturns	0.003***	0.005***	0.002***	0.001***	0.004***	0.005***	0.003***	0.005***	0.002***	0.001***	0.004***	0.005***
	(10.93)	(18.88)	(9.81)	(8.85)	(8.46)	(20.42)	(10.95)	(18.71)	(9.47)	(8.70)	(8.38)	(19.79)
L2.UnexpectedEquityLocalReturns	0.001***	-0.001***	-0.001***	0.001***	0.001	-0.001***	0.001***	-0.001***	-0.001***	0.001***	0.001	-0.001***
	(3.69)	(-4.75)	(-5.00)	(4.29)	(1.25)	(-2.92)	(3.99)	(-4.28)	(-4.09)	(4.20)	(1.28)	(-3.07)
L3.UnexpectedEquityLocalReturns	0.000	-0.001***	-0.001***	0.000***	0.000	-0.001***	0.000	-0.001***	-0.001***	0.000***	0.001	-0.001***
	(1.06)	(-3.45)	(-3.40)	(2.97)	(0.92)	(-3.52)	(1.27)	(-3.01)	(-3.42)	(2.83)	(1.34)	(-3.39)
L4.UnexpectedEquityLocalReturns	-0.001***	-0.001***	-0.000	0.000	-0.001	-0.001***	-0.001***	-0.001***	-0.000	0.000	-0.001	-0.001***
	(-3.16)	(-2.82)	(-0.60)	(1.29)	(-1.18)	(-4.46)	(-2.77)	(-2.73)	(-0.26)	(1.48)	(-1.26)	(-4.29)
L5.UnexpectedEquityLocalReturns	-0.000	-0.001***	-0.000	-0.000	-0.001*	-0.001***	-0.000	-0.001***	-0.000	-0.000	-0.001**	-0.001***
	(-1.45)	(-3.40)	(-1.39)	(-0.30)	(-1.91)	(-3.61)	(-1.40)	(-3.68)	(-1.37)	(-0.21)	(-2.06)	(-3.47)
Adj. R2	0.149	0.391	0.252	0.104	0.516	0.484	0.150	0.391	0.253	0.104	0.517	0.483
Granger	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Table 3.5 Explanatory power of expected and unexpected FX returns on foreign equity flows.

This table shows the results from the flows equations for a bivariate structural vector autoregressive models (SVAR) of foreign equity flows and expected (unexpected) FX returns without (with) equity local returns as an exogenous variable in Panel A (Panel B). The VAR is structural as we include contemporaneous expected (unexpected) FX returns in the flows equation. The SVAR is estimated separately for each country with five lags. The L. is the lag operator. We report t-statistics computed using maximum likelihood estimates of covariance matrix in parentheses, while *, ** and *** indicates statistical significance at the 10%, 5% and 1% level, respectively. We report adjusted R^2 and the p-values of Granger causality test for the hypothesis: Past expected (unexpected) FX returns do not Granger-cause flows.

	Without exogenous variable						With past equity local returns as an exogenous variable					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
Panel A: Flows equations with expected FX returns												
ExpectedFXReturns	**-0.002**	**0.002**	**-0.020**	**-0.018*** **	**0.083** **	**0.020*** **	**-0.002**	**-0.001**	**0.005**	**-0.003**	**0.089** **	**0.009***
	(-0.96)	(0.65)	(-1.22)	(-3.05)	(2.25)	(3.99)	(-0.98)	(-0.34)	(0.31)	(-0.43)	(2.39)	(1.88)
L.ExpectedFXReturns	-0.000	0.006*	0.008	-0.010*	-0.094**	-0.007	-0.000	0.004	0.014	-0.000	-0.092**	-0.007
	(-0.11)	(1.75)	(0.48)	(-1.73)	(-2.55)	(-1.38)	(-0.16)	(1.29)	(0.80)	(-0.00)	(-2.51)	(-1.51)
L2.ExpectedFXReturns	-0.005**	0.003	-0.005	0.006	0.034	-0.003	-0.005**	-0.000	-0.029	0.008	0.036	-0.003
	(-2.20)	(0.97)	(-0.27)	(1.04)	(0.88)	(-0.67)	(-2.16)	(-0.07)	(-1.64)	(1.41)	(0.94)	(-0.64)
L3.ExpectedFXReturns	-0.002	0.000	-0.013	0.023***	-0.067*	0.003	-0.002	0.003	-0.023	0.019***	-0.070*	0.002
	(-0.74)	(0.14)	(-0.84)	(4.02)	(-1.83)	(0.65)	(-0.91)	(1.12)	(-1.57)	(3.28)	(-1.93)	(0.45)
L4.ExpectedFXReturns	0.000	-0.001	0.017*	0.005	-0.012	-0.018***	0.000	-0.003	0.013	0.003	-0.011	-0.015***
	(0.02)	(-0.38)	(1.77)	(0.98)	(-0.34)	(-3.59)	(0.09)	(-0.93)	(1.34)	(0.54)	(-0.32)	(-3.10)
L5.ExpectedFXReturns	-0.001	0.004	0.018**	-0.002	0.025	0.004	0.001	0.007**	0.014	-0.002	0.018	0.005
	(-0.42)	(1.44)	(2.09)	(-0.34)	(1.06)	(0.85)	(0.37)	(2.27)	(1.60)	(-0.38)	(0.74)	(1.20)
Adj. R2	0.049	0.258	0.206	0.059	0.280	0.331	0.076	0.320	0.232	0.083	0.291	0.390
Granger	0.298	0.089	0.174	0.001	0.106	0.013	0.874	0.125	0.195	0.015	0.137	0.113
Panel B: Flows equations with unexpected FX returns												
UnexpectedFXReturns	**0.001*** **	**0.004*** **	**0.003*** **	**0.002*** **	**0.042*** **	**0.005*** **	**0.001*** **	**0.004*** **	**0.003*** **	**0.002*** **	**0.042*** **	**0.004*** **
	(3.74)	(7.02)	(4.58)	(3.74)	(19.50)	(6.02)	(2.83)	(7.69)	(4.96)	(3.84)	(19.68)	(5.56)
L.UnexpectedFXReturns	0.000	0.002***	0.002***	0.002***	0.006***	0.005***	-0.000*	-0.000	0.000	0.001	0.004*	0.002***
	(0.52)	(4.74)	(3.11)	(3.27)	(2.72)	(5.93)	(-1.69)	(-0.75)	(0.21)	(1.21)	(1.66)	(3.22)
L2.UnexpectedFXReturns	-0.000	-0.000	-0.002***	0.000	0.002	0.000	-0.000	-0.000	-0.001*	-0.001	0.001	0.000
	(-1.13)	(-0.20)	(-2.71)	(1.05)	(0.93)	(0.61)	(-1.51)	(-0.12)	(-1.78)	(-1.35)	(0.48)	(0.43)
L3.UnexpectedFXReturns	-0.000	-0.001**	-0.000	0.001	-0.005**	-0.001*	-0.000	-0.001**	0.000	0.000	-0.005**	-0.000
	(-0.18)	(-2.56)	(-0.24)	(1.41)	(-2.10)	(-1.66)	(-0.13)	(-2.31)	(0.44)	(0.27)	(-2.39)	(-0.35)
L4.UnexpectedFXReturns	-0.000*	-0.001**	-0.001	0.000	0.001	0.000	-0.000	-0.000	-0.001	-0.000	0.001	0.000
	(-1.67)	(-2.52)	(-1.33)	(0.09)	(0.46)	(0.23)	(-1.33)	(-0.96)	(-0.88)	(-0.75)	(0.36)	(0.58)
L5.UnexpectedFXReturns	-0.000	-0.001	-0.000	-0.000	0.002	-0.001	-0.000	-0.000	0.000	-0.000	0.002	-0.001
	(-0.57)	(-1.52)	(-0.33)	(-0.21)	(0.84)	(-1.49)	(-0.58)	(-0.72)	(0.07)	(-0.61)	(1.03)	(-1.52)
Adj. R2	0.052	0.271	0.212	0.061	0.356	0.339	0.080	0.329	0.236	0.084	0.367	0.395
Granger	0.453	0.000	0.002	0.017	0.018	0.000	0.166	0.170	0.492	0.498	0.082	0.027

Table 3.6 The price impact of foreign equity flows on FX returns.

This table shows the results from the FX returns equations for a bivariate structural vector autoregressive models (SVAR) of foreign equity flows and FX returns with no exogenous variable in Panel A, and with equity local returns as an exogenous variable in Panel B, respectively. The VAR is structural as we include contemporaneous flows in the FX returns equation. Both SVARs are estimated separately for each country with five lags. The L. is the lag operator. We report t-statistics computed using maximum likelihood estimates of covariance matrix in parentheses, while *, ** and *** indicates statistical significance at the 10%, 5% and 1% level, respectively. We report adjusted R^2 and the p-values of Granger causality test for the hypothesis: Past flows do not Granger-cause FX returns.

	Panel A: Without exogenous variables						Panel B: With past equity local returns as an exogenous variable					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
Flows	**3.908*** **	**3.361*** **	**2.087*** **	**2.258*** **	**2.507*** **	**1.831*** **	**2.985*** **	**3.811*** **	**2.290*** **	**2.345*** **	**2.550*** **	**1.688*** **
	(3.75)	(6.97)	(4.59)	(3.76)	(19.45)	(5.47)	(2.83)	(7.61)	(4.96)	(3.85)	(19.64)	(4.83)
L.Flows	0.604	-0.404	0.242	-0.264	-0.579***	1.005***	-0.643	-0.453	0.196	-0.111	-0.367**	0.755*
	(0.57)	(-0.78)	(0.50)	(-0.43)	(-3.93)	(2.69)	(-0.58)	(-0.82)	(0.40)	(-0.18)	(-2.20)	(1.88)
L2.Flows	1.120	0.611	0.147	0.064	0.058	-0.193	1.025	0.058	-0.100	0.221	0.090	-0.284
	(1.06)	(1.17)	(0.31)	(0.10)	(0.39)	(-0.52)	(0.93)	(0.10)	(-0.20)	(0.36)	(0.53)	(-0.71)
L3.Flows	2.367**	0.086	0.982**	0.318	-0.057	-0.772**	3.204***	0.769	1.040**	0.350	-0.025	-0.858**
	(2.24)	(0.17)	(2.04)	(0.52)	(-0.39)	(-2.06)	(2.91)	(1.39)	(2.12)	(0.57)	(-0.15)	(-2.13)
L4.Flows	-4.144***	0.534	-0.710	0.540	-0.327**	0.129	-2.337**	0.650	-0.505	0.552	-0.392**	0.325
	(-3.92)	(1.03)	(-1.47)	(0.89)	(-2.22)	(0.34)	(-2.12)	(1.18)	(-1.03)	(0.90)	(-2.35)	(0.81)
L5.Flows	-0.084	-0.089	-0.212	0.895	-0.078	-0.029	0.311	-0.542	-0.124	0.943	-0.118	0.175
	(-0.08)	(-0.18)	(-0.47)	(1.49)	(-0.58)	(-0.09)	(0.29)	(-1.09)	(-0.27)	(1.55)	(-0.78)	(0.51)
Adj. R2	0.015	0.046	0.011	0.009	0.115	0.049	0.024	0.052	0.014	0.009	0.116	0.049
Granger	0.001	0.567	0.246	0.502	0.000	0.040	0.021	0.383	0.389	0.444	0.003	0.133

Table 3.7 Robustness checks on correlations.

This table shows the robustness results on the correlations between our three key variables, i.e.: foreign net flows (NF_{it}), FX returns (FXR_{it}) and equity local returns (ELR_{it}) in daily frequency for six equity markets. Panel A shows correlations between FX returns and equity local returns during global up and down periods according to different definitions. Panel B shows the correlations between FX returns and equity local returns in crisis and non-crisis subsamples. Panel C shows the correlations between FX returns and equity return differentials using different benchmarks. Stars mean that the correlation coefficient is significant at the 5% level or better.

Panel A: Correlations between FX returns and equity local returns during global up and down periods

	Up perid (when the returns of MSCI world index are positive, replicating Cho et al., 2014)		Down perid (when the returns of MSCI world index are negative, replicating Cho et al.,2014)		Up perid (when equity local returns are positive)		Down perid (when equity local returns are negative)		Up perid (when the returns of MSCI EM index are positive)		Down perid (when the returns of MSCI EM index are negative)	
	corr(NF*ELR)	corr(ELR*FXR)	corr(NF*ELR)	corr(ELR*FXR)	corr(NF*ELR)	corr(ELR*FXR)	corr(NF*ELR)	corr(ELR*FXR)	corr(NF*ELR)	corr(ELR*FXR)	corr(NF*ELR)	corr(ELR*FXR)
Indonesia (JSX)	0.3109*	0.2039*	0.2725*	0.2088*	0.2344*	0.1988*	0.1894*	0.2365*	0.3157*	0.1179*	0.2713*	0.1472*
Korea (Kospi)	0.2583*	0.2258*	0.2506*	0.2707*	0.2185*	0.2203*	0.2024*	0.2782*	0.2383*	0.1604*	0.2223*	0.2513*
Korea (Kosdaq)	0.0980*	0.2273*	0.2196*	0.2783*	0.0943*	0.1737*	0.0648*	0.2538*	0.1534*	0.1083*	0.2067*	0.2809*
Philippines (PSE)	0.1606*	0.3401*	0.2328*	0.2383*	0.1147*	0.1843*	0.1686*	0.1890*	0.1599*	0.2404*	0.2149*	0.1830*
Taiwan (TWSE)	0.3701*	0.2530*	0.5381*	0.2688*	0.2230*	0.1694*	0.4687*	0.1879*	0.3427*	0.1981*	0.4855*	0.2263*
Thailand (SET)	0.3340*	0.1584*	0.3741*	0.2017*	0.2485*	0.2006*	0.2869*	0.1437*	0.3567*	0.1489*	0.2911*	0.1294*

Panel B: Correlations between FX returns and equity local returns during Asian Financial Crisis and Dotcom crisis, non-crisis and Global Financial Crisis periods

	Asian and Dotcom Crisis (before Oct 9, 2002)			Non-crisis (from Oct 9, 2002 to Aug 9, 2007)			Global Financial Crisis (after Aug 9, 2007)		
	corr(NF*ELR)	corr(ELR*FXR)	corr(NF*FXR)	corr(NF*ELR)	corr(ELR*FXR)	corr(NF*FXR)	corr(NF*ELR)	corr(ELR*FXR)	corr(NF*FXR)
Indonesia (JSX)	0.3239*	0.1832*	0.0692*	0.2688*	0.3872*	0.0719*	0.3005*	0.3460*	0.0928*
Korea (Kospi)	0.3132*	0.2331*	0.0647*	0.2336*	0.1810*	0.1147*	0.3962*	0.5346*	0.2463*
Korea (Kosdaq)	0.1396*	0.1811*	0.0936*	0.2234*	0.1667*	0.0406	0.3086*	0.4882*	0.1457*
Philippines (PSE)	0.2847*	0.2104*	0.0737*	0.1492*	0.1832*	0.0719*	0.1365*	0.3114*	0.0527*
Taiwan (TWSE)	0.3922*	0.1378*	0.1427*	0.4851*	0.2472*	0.3209*	0.6007*	0.4143*	0.4207*
Thailand (SET)	0.3947*	0.2148*	0.1144*	0.3912*	0.1235*	0.1886*	0.3609*	0.2806*	0.1723*

Panel C: Correlations between FX returns and equity return differentials (ΔELR) with different benchmarks

	S&P500		Nasdaq		Philadelphia Semiconductor index		MSCI World		MSCI EM	
	corr(NF*ΔELR)	corr(ΔELR*FXR)	corr(NF*ΔELR)	corr(ΔELR*FXR)	corr(NF*ΔELR)	corr(ΔELR*FXR)	corr(NF*ΔELR)	corr(ΔELR*FXR)	corr(NF*ΔELR)	corr(ΔELR*FXR)
Indonesia (JSX)	0.2343*	0.1254*	0.2026*	0.1001*	0.1546*	0.0628*	0.2476*	0.1282*	0.1848*	0.0597*
Korea (Kospi)	0.2690*	0.2073*	0.2278*	0.1731*	0.1615*	0.1217*	0.2607*	0.1942*	0.1493*	0.0703*
Korea (Kosdaq)	0.1617*	0.1599*	0.1302*	0.1254*	0.0968*	0.0867*	0.1531*	0.1178*	0.1086*	-0.0590*
Philippines (PSE)	0.1292*	0.1139*	0.1136*	0.0866*	0.0925*	0.0494*	0.1363*	0.0585*	0.0977*	-0.1085*
Taiwan (TWSE)	0.3682*	0.1712*	0.3053*	0.1490*	0.2023*	0.1014*	0.3414*	0.1241*	0.1295*	-0.0836*
Thailand (SET)	0.3047*	0.1429*	0.2599*	0.1101*	0.1896*	0.0574*	0.2938*	0.1136*	0.1447*	0.0149

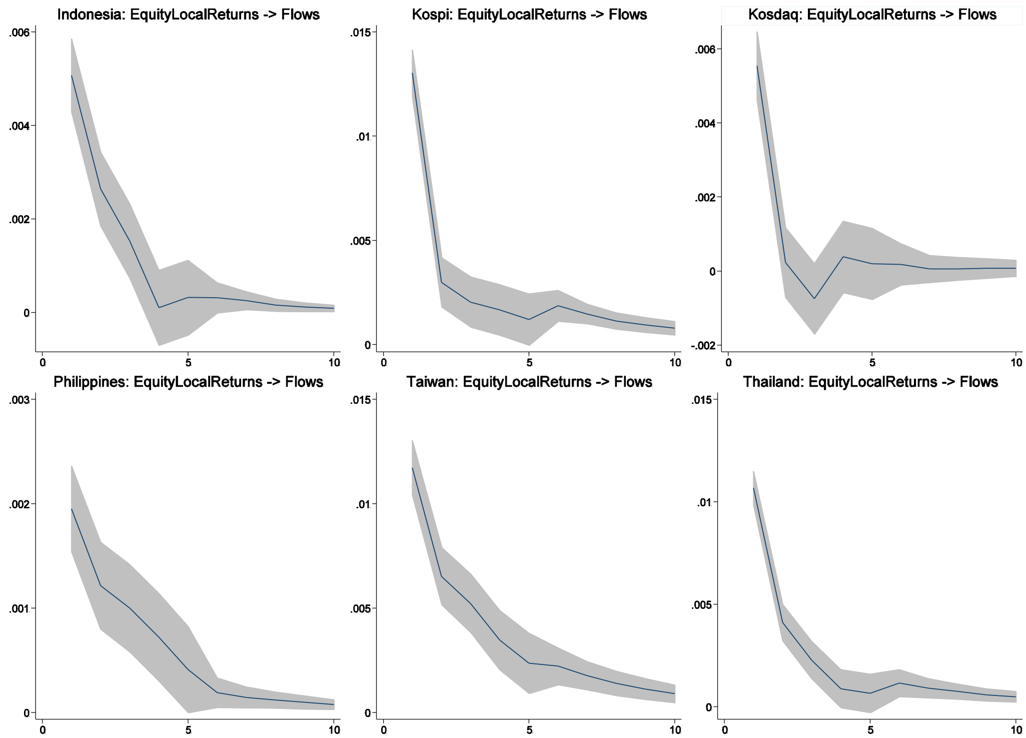


Figure 3.1 Responses of foreign equity flows to equity local returns shocks.

This figure shows the responses of foreign equity flows to a one-standard-deviation innovation in equity local returns using general impulse response function from the next trading day. The estimates are obtained from a structural bivariate vector autoregressive models (SVAR) of foreign equity flows and equity local returns with FX returns in its past 5 lags as an exogenous variable. The VAR is estimated for each market separately with 5 lags, using daily data from various starting dates to the end of 2013. The grey area is 95% confidence intervals based on asymptotic standard errors.

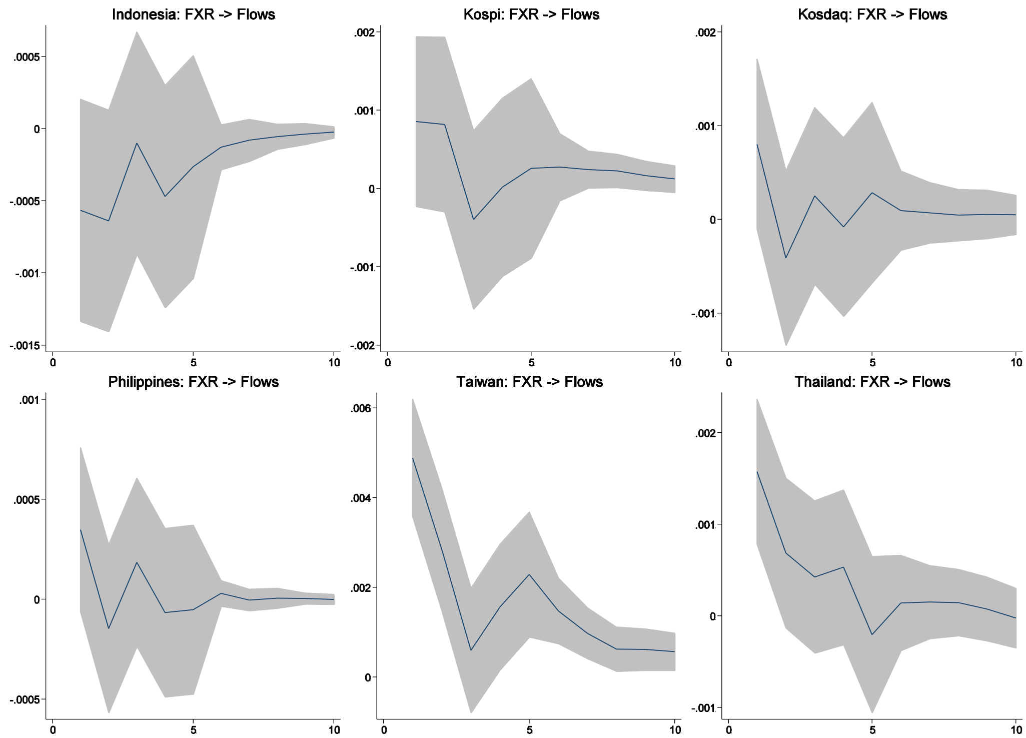


Figure 3.2 Responses of foreign equity flows to FX shocks.

This figure shows the responses of foreign equity flows to a one-standard-deviation innovation in FX returns using general impulse response function from the next trading day. The estimates are obtained from a structural bivariate vector autoregressive models (SVAR) of foreign equity flows and FX returns with equity local returns in its past 5 lags as an exogenous variable. The VAR is estimated for each market separately with 5 lags, using daily data from various starting dates to the end of 2013. The grey area is 95% confidence intervals based on asymptotic standard errors.

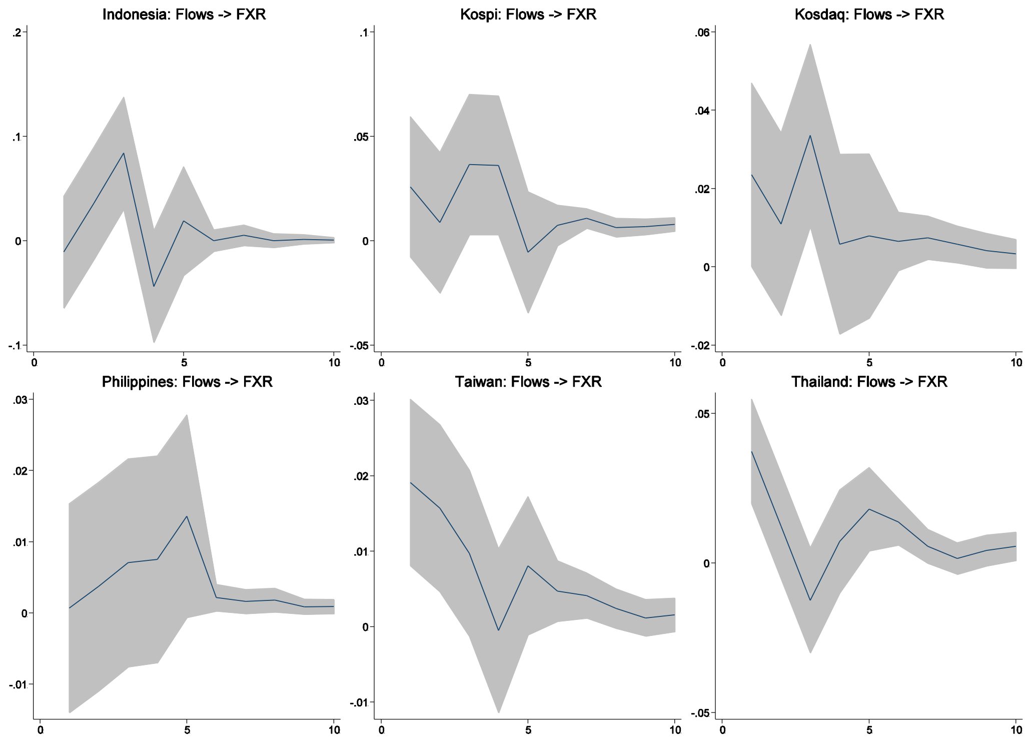


Figure 3.3 Responses of FX returns to foreign equity flows shocks.

This figure shows the responses of FX returns (FXR) to a one-standard-deviation innovation in foreign equity flows using general impulse response function from the next trading day. The estimates are obtained from a structural bivariate vector autoregressive models (SVAR) of foreign equity flows and FX returns with equity local returns in its past 5 lags as an exogenous variable. The VAR is estimated for each market separately with 5 lags, using daily data from various starting dates to the end of 2013. The grey area is 95% confidence intervals based on asymptotic standard errors.

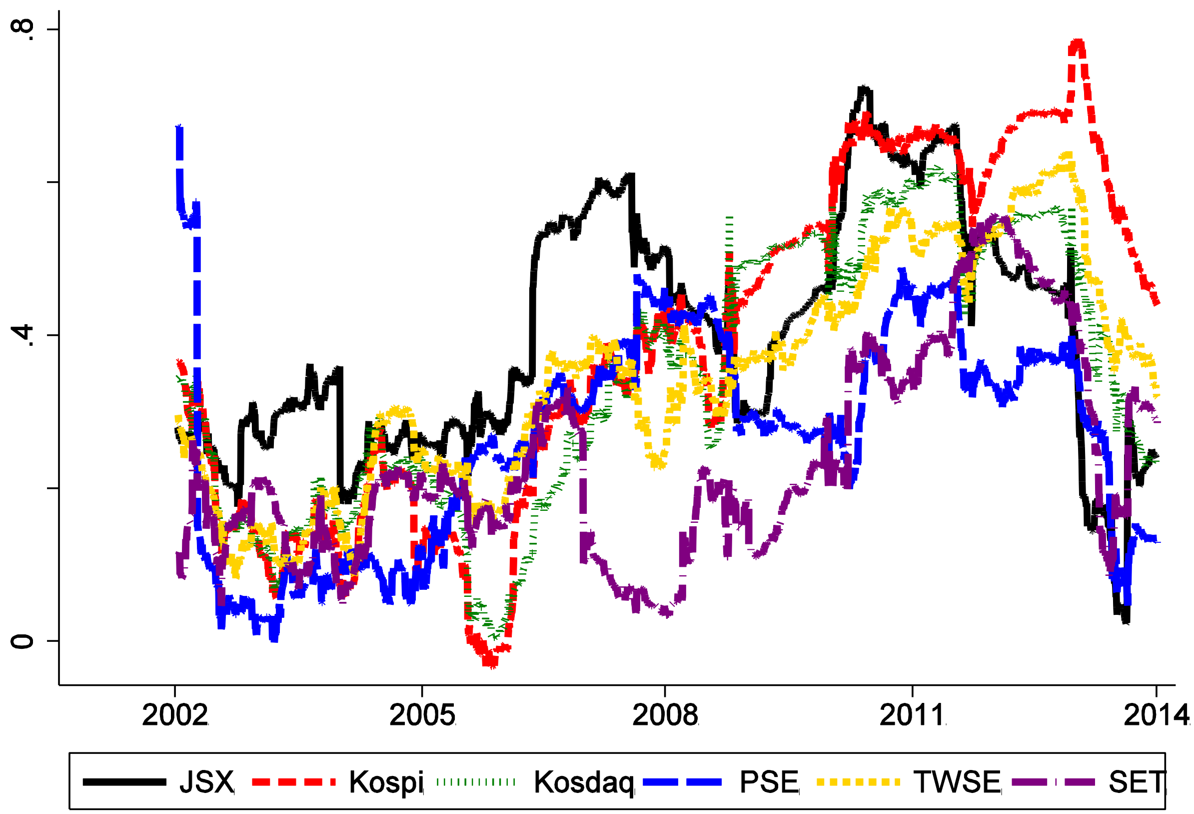


Figure 3.4 Moving correlation between equity local returns and FX retunes.

This figure plots the 250-trading-day moving (rolling) correlations between equity local returns and FX returns for the six emerging markets in our sample.

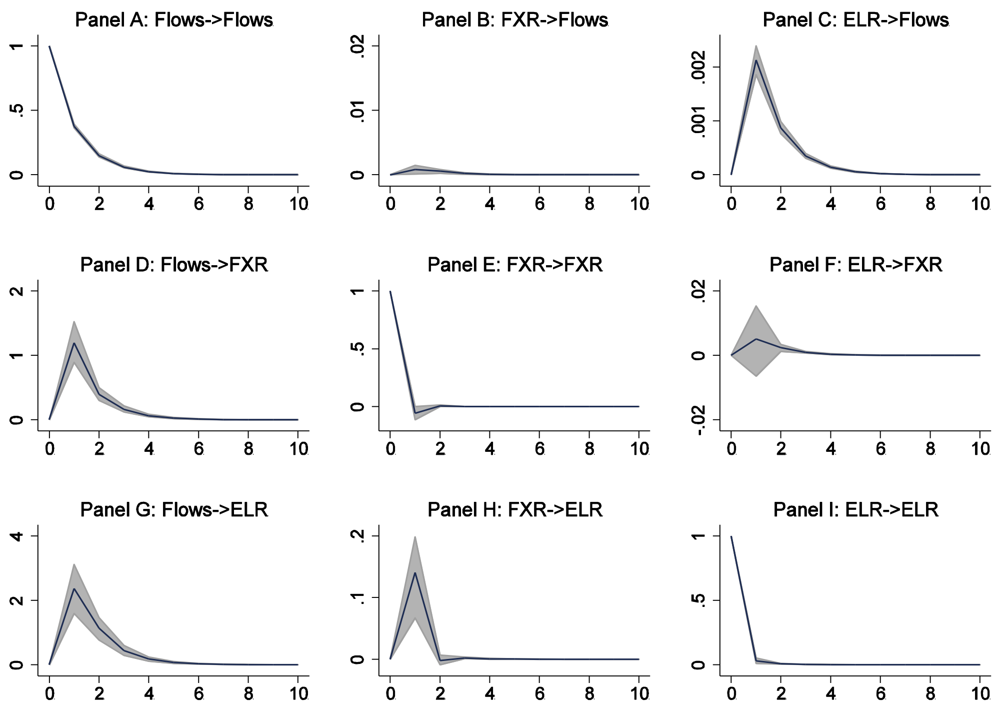
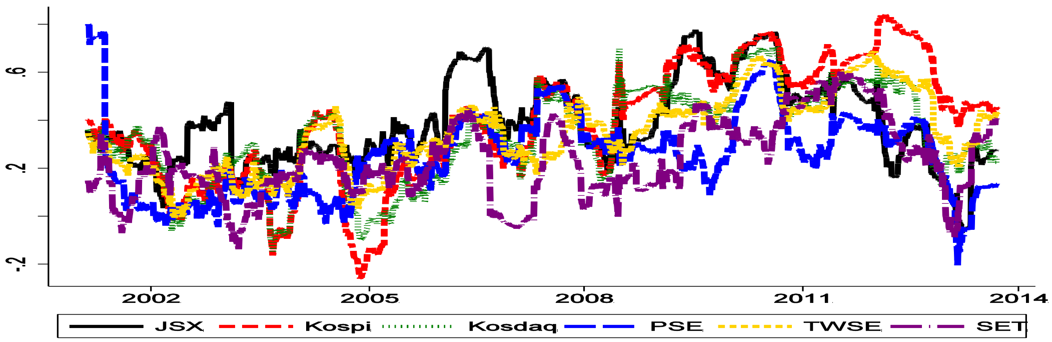


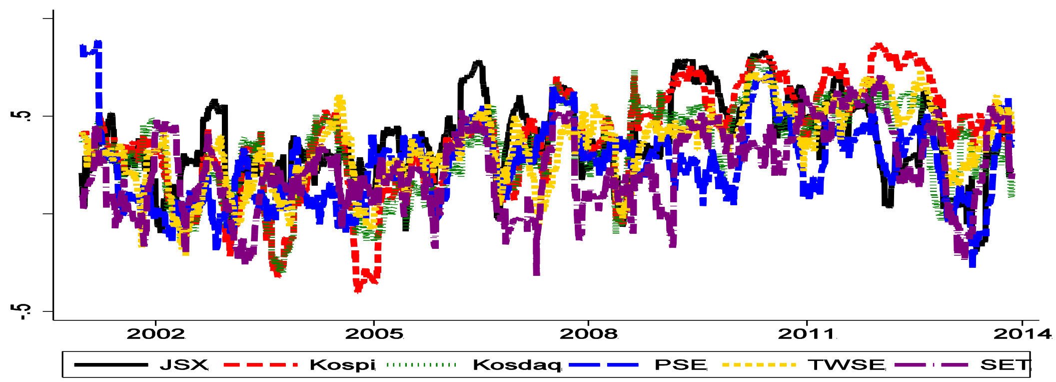
Figure 3.5 Impulse responses analyses of a tri-variate panel-VAR system.

This figure shows the responses of flows, FX returns (FXR) and equity local returns (ELR) to a one-standard-deviation innovation in flows in the left-top, left-middle and left-bottom panels, respectively; the responses of flows, FX returns and equity local returns to a one-standard-deviation innovation in FX returns in the middle-top, middle-middle and middle-bottom panels, respectively; and the responses of flows, FX returns and equity local returns to a one-standard-deviation innovation in equity local returns in the right-top, right-middle and right-bottom panels, respectively. The estimates are obtained from a fixed-effect tri-variate panel-VAR with 5 lags using daily data from January 1, 2001 (duo to the data availability of Taiwan) to the end of 2013. The grey area is 95% confidence intervals based on asymptotic standard errors.

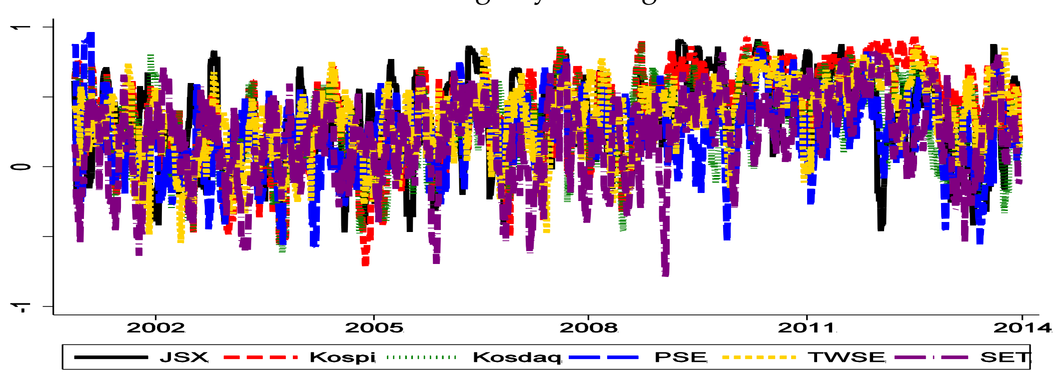
Appendix 3A. Moving correlations calculated from various windows.
The figure reports 125-trading-day (half a year), 63-trading-day (one calendar quarter) or 21-trading-day (one calendar month) moving correlations between equity local returns and FX returns for the six emerging markets in our sample.



Panel A. 125-trading-day moving correlations



Panel B. 63-trading-day moving correlations



Panel C. 21-trading-day moving correlations

Appendix 3B. Explanatory power of equity local returns on foreign equity flows.

This table shows the results from various robustness tests on the explanatory power of equity local returns on foreign equity flows, based on the flows equation (3.2b) for a bivariate structural vector autoregressive models (SVAR) of foreign equity flows and equity local returns (ELR) with FX returns as an exogenous variable. The VAR is structural as we include contemporaneous equity local returns in the flows equation. The L. is the lag operator. We report t-statistics computed using maximum likelihood estimates of covariance matrix in parentheses, while *, ** and *** indicates statistical significance at the 10%, 5% and 1% level, respectively.

	Panel A: Without winsorization						Panel B: Using 1-day lagged flows					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
EquityLocalReturns	0.004***	0.006***	0.002***	0.002***	0.014***	0.006***	-0.000	0.001***	0.000**	-0.000	0.001***	0.001***
	(6.30)	(21.05)	(10.11)	(6.17)	(38.04)	(26.48)	(-0.73)	(2.71)	(2.42)	(-0.30)	(3.86)	(6.55)
L.EquityLocalReturns	**0.003*** **	**0.005*** **	**0.002*** **	**0.001*** **	**0.004*** **	**0.004*** **	**0.004*** **	**0.005*** **	**0.002*** **	**0.001*** **	**0.012*** **	**0.005*** **
	(3.73)	(17.92)	(7.39)	(5.25)	(8.39)	(16.45)	(18.22)	(20.42)	(8.79)	(9.22)	(34.15)	(25.32)
L2.EquityLocalReturns	0.001	-0.001***	-0.001***	0.001**	0.001	-0.001***	0.002***	0.005***	0.002***	0.001***	0.004***	0.004***
	(1.17)	(-2.94)	(-4.70)	(2.57)	(1.19)	(-2.94)	(8.23)	(18.20)	(8.43)	(7.56)	(8.57)	(18.22)
L3.EquityLocalReturns	0.001	-0.000	-0.001***	0.001**	0.001	-0.001*	0.001***	-0.001***	-0.001***	0.001***	0.001	-0.001***
	(1.17)	(-0.36)	(-2.75)	(1.98)	(1.36)	(-1.87)	(2.62)	(-3.36)	(-5.50)	(3.40)	(1.57)	(-3.61)
L4.EquityLocalReturns	-0.000	-0.000	0.000	0.001**	-0.000	-0.001***	0.000	-0.000	-0.001***	0.000***	0.001*	-0.001***
	(-0.41)	(-0.32)	(0.01)	(2.56)	(-0.57)	(-3.23)	(1.39)	(-0.40)	(-3.20)	(3.06)	(1.73)	(-2.91)
L5.EquityLocalReturns	0.000	-0.000	-0.000	0.000	-0.000	-0.001***	-0.001**	-0.000	-0.000	0.000*	-0.000	-0.001***
	(0.21)	(-0.84)	(-0.78)	(0.50)	(-0.93)	(-2.69)	(-2.17)	(-0.87)	(-0.22)	(1.76)	(-0.73)	(-3.81)
	Panel C: Controlling for the returns of SP500						Panel D: Controlling for the returns of Nasdaq					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
EquityLocalReturns	-0.000	0.001**	0.001***	-0.000	0.001***	0.001***	-0.000	0.001**	0.001**	-0.000	0.001**	0.001***
	(-0.78)	(2.35)	(2.58)	(-0.46)	(3.25)	(6.42)	(-0.84)	(2.38)	(2.41)	(-0.32)	(2.49)	(6.44)
L.EquityLocalReturns	**0.004*** **	**0.004*** **	**0.002*** **	**0.001*** **	**0.010*** **	**0.005*** **	**0.004*** **	**0.004*** **	**0.001*** **	**0.001*** **	**0.010*** **	**0.005*** **
	(16.64)	(14.74)	(6.94)	(8.62)	(28.05)	(22.44)	(17.04)	(13.81)	(6.43)	(8.76)	(27.52)	(22.98)
L2.EquityLocalReturns	0.002***	0.004***	0.002***	0.001***	0.003***	0.004***	0.002***	0.004***	0.002***	0.001***	0.003***	0.004***
	(7.88)	(15.52)	(7.33)	(6.87)	(6.18)	(16.48)	(7.85)	(15.83)	(7.30)	(7.16)	(6.20)	(17.00)
L3.EquityLocalReturns	0.001**	-0.001***	-0.001***	0.001***	0.000	-0.001***	0.001**	-0.001***	-0.001***	0.001***	0.000	-0.001***
	(2.24)	(-4.59)	(-5.19)	(3.19)	(1.01)	(-3.24)	(2.29)	(-4.35)	(-4.76)	(3.21)	(1.00)	(-3.33)
L4.EquityLocalReturns	0.000	-0.000	-0.001***	0.001***	0.001*	-0.001***	0.000	0.000	-0.001***	0.001***	0.001	-0.001***
	(1.05)	(-0.08)	(-2.97)	(3.01)	(1.77)	(-2.83)	(1.00)	(0.47)	(-2.90)	(3.22)	(1.46)	(-2.90)
L5.EquityLocalReturns	-0.001**	-0.000	-0.000	0.000*	-0.000	-0.001***	-0.001**	-0.001*	-0.000	0.000*	-0.000	-0.001***
	(-2.21)	(-1.46)	(-0.36)	(1.75)	(-0.57)	(-3.68)	(-2.17)	(-1.88)	(-0.67)	(1.75)	(-0.91)	(-3.59)
	Panel E: Controlling for the returns of Philadelphia Semiconductor index						Panel F: Controlling for the returns of MSCIWorld					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
EquityLocalReturns	-0.000	0.000	0.000**	-0.000	0.001**	0.001***	-0.000	0.001**	0.000**	-0.000	0.001**	0.001***
	(-0.77)	(1.45)	(2.35)	(-0.23)	(2.28)	(6.39)	(-0.71)	(2.07)	(2.26)	(-0.40)	(2.47)	(5.94)
L.EquityLocalReturns	**0.004*** **	**0.004*** **	**0.002*** **	**0.001*** **	**0.010*** **	**0.005*** **	**0.004*** **	**0.004*** **	**0.002*** **	**0.001*** **	**0.011*** **	**0.005*** **
	(17.41)	(14.03)	(6.85)	(9.00)	(28.34)	(24.08)	(16.57)	(14.46)	(6.93)	(8.66)	(27.94)	(21.77)
L2.EquityLocalReturns	0.002***	0.004***	0.002***	0.001***	0.003***	0.004***	0.002***	0.004***	0.002***	0.001***	0.002***	0.004***
	(7.89)	(16.54)	(7.61)	(7.44)	(6.20)	(17.50)	(7.35)	(13.20)	(6.75)	(7.04)	(5.36)	(15.01)
L3.EquityLocalReturns	0.001**	-0.001***	-0.001***	0.001***	0.000	-0.001***	0.001**	-0.001***	-0.001***	0.001***	0.001	-0.001**
	(2.48)	(-3.81)	(-4.78)	(3.41)	(1.11)	(-3.47)	(2.33)	(-4.12)	(-5.09)	(3.29)	(1.30)	(-2.47)
L4.EquityLocalReturns	0.000	0.000	-0.001***	0.000***	0.001	-0.001***	0.000	-0.000	-0.001***	0.000***	0.001*	-0.001***
	(1.02)	(0.36)	(-2.98)	(3.10)	(1.42)	(-2.97)	(1.00)	(-0.79)	(-2.87)	(2.92)	(1.69)	(-2.96)
L5.EquityLocalReturns	-0.001**	-0.001**	-0.000	0.000*	-0.000	-0.001***	-0.001**	-0.000	-0.000	0.000*	-0.000	-0.001***
	(-2.17)	(-2.16)	(-0.71)	(1.74)	(-0.90)	(-3.80)	(-2.21)	(-1.48)	(-0.49)	(1.74)	(-0.78)	(-3.58)

(Cont.)

	Panel G: Controlling for the returns of MSCIEM						Panel H: Controlling for the VIX					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
EquityLocalReturns	-0.000	0.000	0.001**	-0.000	0.001	0.001***	-0.000	0.001***	0.000**	-0.000	0.001***	0.001***
	(-0.90)	(1.63)	(2.37)	(-0.63)	(1.47)	(6.09)	(-0.69)	(2.79)	(2.39)	(-0.35)	(3.82)	(6.55)
L.EquityLocalReturns	**0.004*** **	**0.003*** **	**0.001*** **	**0.001*** **	**0.008*** **	**0.004*** **	**0.004*** **	**0.005*** **	**0.002*** **	**0.001*** **	**0.012*** **	**0.005*** **
	(14.52)	(8.60)	(4.84)	(8.10)	(18.24)	(16.76)	(18.26)	(20.45)	(8.79)	(9.27)	(34.11)	(25.31)
L2.EquityLocalReturns	0.002***	0.003***	0.001***	0.001***	0.002***	0.004***	0.002***	0.005***	0.002***	0.001***	0.004***	0.004***
	(6.03)	(10.88)	(5.47)	(6.49)	(3.27)	(14.96)	(8.22)	(18.31)	(8.48)	(7.58)	(8.52)	(18.23)
L3.EquityLocalReturns	0.001**	-0.001***	-0.001***	0.001***	0.001**	-0.001**	0.001***	-0.001***	-0.001***	0.001***	0.001	-0.001***
	(2.47)	(-4.15)	(-4.19)	(3.38)	(2.32)	(-2.06)	(2.68)	(-3.18)	(-5.45)	(3.35)	(1.59)	(-3.59)
L4.EquityLocalReturns	0.000	-0.000	-0.001***	0.001***	-0.000	-0.001***	0.000	-0.000	-0.001***	0.000***	0.001*	-0.001***
	(0.81)	(-0.66)	(-3.37)	(3.04)	(-0.40)	(-2.75)	(1.41)	(-0.24)	(-3.13)	(3.13)	(1.73)	(-2.95)
L5.EquityLocalReturns	-0.001**	-0.001**	-0.000	0.000*	-0.000	-0.001***	-0.001**	-0.000	-0.000	0.000*	-0.000	-0.001***
	(-2.05)	(-2.05)	(-0.93)	(1.84)	(-0.93)	(-3.10)	(-2.13)	(-0.72)	(-0.20)	(1.77)	(-0.70)	(-3.80)
	Panel I: Scaling flows by the trading volume						Panel J: Scaling flows by the average of absolute flows of the previous 21 trading days					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
EquityLocalReturns	2.335***	0.733***	0.086***	3.453***	2.503***	0.002***	24.987***	17.445***	10.225***	23.991***	42.984***	24.140***
	(17.51)	(19.81)	(9.37)	(11.00)	(38.33)	(25.39)	(20.20)	(20.25)	(10.66)	(13.11)	(37.72)	(24.00)
L.EquityLocalReturns	**0.820*** **	**0.617*** **	**0.055*** **	**2.352*** **	**0.441*** **	**0.001*** **	**10.431*** **	**16.213*** **	**6.228*** **	**18.650*** **	**10.826*** **	**20.763*** **
	(5.77)	(15.23)	(5.62)	(7.12)	(5.53)	(14.37)	(7.83)	(17.17)	(6.09)	(9.62)	(7.81)	(19.00)
L2.EquityLocalReturns	0.216	-0.112***	-0.046***	0.935***	0.051	-0.000***	2.475*	-2.003**	-4.461***	8.764***	2.865**	-1.310
	(1.51)	(-2.70)	(-4.66)	(2.81)	(0.64)	(-3.10)	(1.84)	(-2.05)	(-4.34)	(4.46)	(2.05)	(-1.15)
L3.EquityLocalReturns	0.066	-0.040	-0.027***	1.013***	0.005	-0.000***	2.178	-0.372	-2.932***	6.055***	2.158	-2.170*
	(0.46)	(-0.95)	(-2.75)	(3.05)	(0.07)	(-2.74)	(1.62)	(-0.38)	(-2.85)	(3.08)	(1.55)	(-1.91)
L4.EquityLocalReturns	-0.220	-0.047	-0.003	0.680**	-0.077	-0.000***	-2.413*	-0.492	-0.469	3.462*	-0.380	-2.829**
	(-1.54)	(-1.13)	(-0.33)	(2.04)	(-0.99)	(-3.84)	(-1.80)	(-0.51)	(-0.46)	(1.76)	(-0.28)	(-2.49)
L5.EquityLocalReturns	0.076	-0.050	-0.016*	0.163	-0.089	-0.000***	0.689	-0.465	-1.100	2.330	-0.504	-3.063***
	(0.53)	(-1.22)	(-1.65)	(0.50)	(-1.16)	(-3.36)	(0.51)	(-0.48)	(-1.08)	(1.21)	(-0.37)	(-2.72)
	Panel K: Scaling flows by the average of absolute flows of the previous 63 trading days						Panel L: Scaling flows by the average of absolute flows of the previous 125 trading days					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
EquityLocalReturns	24.425***	17.679***	10.780***	23.823***	42.746***	24.830***	24.063***	17.777***	11.515***	21.999***	42.462***	25.650***
	(19.16)	(20.71)	(11.21)	(12.06)	(38.05)	(24.88)	(19.39)	(20.52)	(11.88)	(10.42)	(37.56)	(24.98)
L.EquityLocalReturns	**10.772*** **	**15.394*** **	**6.373*** **	**18.939*** **	**10.576*** **	**21.200*** **	**11.212*** **	**15.436*** **	**6.700*** **	**19.097*** **	**10.549*** **	**21.991*** **
	(7.87)	(16.42)	(6.21)	(9.08)	(7.72)	(19.42)	(8.41)	(16.22)	(6.46)	(8.61)	(7.66)	(19.57)
L2.EquityLocalReturns	2.773**	-2.518***	-4.602***	9.516***	2.066	-2.666**	2.336*	-3.045***	-4.810***	8.892***	1.633	-2.672**
	(2.01)	(-2.60)	(-4.45)	(4.51)	(1.50)	(-2.33)	(1.74)	(-3.10)	(-4.60)	(3.97)	(1.18)	(-2.27)
L3.EquityLocalReturns	2.246	-0.487	-3.221***	6.920***	1.540	-2.622**	2.470*	-0.478	-3.203***	7.485***	1.434	-2.812**
	(1.63)	(-0.50)	(-3.11)	(3.28)	(1.12)	(-2.30)	(1.84)	(-0.49)	(-3.05)	(3.34)	(1.04)	(-2.39)
L4.EquityLocalReturns	-2.761**	-0.763	-0.405	4.667**	-0.217	-3.269***	-2.554*	-0.715	-0.445	5.837***	-0.693	-3.590***
	(-2.00)	(-0.79)	(-0.39)	(2.21)	(-0.16)	(-2.88)	(-1.90)	(-0.73)	(-0.42)	(2.60)	(-0.51)	(-3.07)
L5.EquityLocalReturns	0.008	-0.703	-0.913	2.846	-0.903	-3.057***	-0.343	-0.789	-0.090	2.199	-1.108	-3.879***
	(0.01)	(-0.74)	(-0.89)	(1.38)	(-0.68)	(-2.72)	(-0.26)	(-0.81)	(-0.09)	(1.00)	(-0.83)	(-3.35)

Appendix 3C. Explanatory power of FX returns on foreign equity flows.

This table shows the results from various robustness tests on the explanatory power of FX returns on foreign equity flows, based on the flows equation (3.4b) for a bivariate structural vector autoregressive models (SVAR) of foreign equity flows and FX returns (FXR) with equity local returns (ELR) as an exogenous variable. The VAR is structural as we include contemporaneous FX returns in the flows equation. The L. is the lag operator. We report t-statistics computed using maximum likelihood estimates of covariance matrix in parentheses, while *, ** and *** indicates statistical significance at the 10%, 5% and 1% level, respectively.

	Panel A: Without winsorization						Panel B: Using 1-day lagged flows					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
FXReturns	0.001	0.003***	0.003***	0.003***	0.044***	0.004***	-0.000	0.001	0.001**	0.000	0.006***	0.002***
	(0.90)	(6.43)	(4.36)	(3.62)	(19.60)	(4.33)	(-0.32)	(1.60)	(2.21)	(0.31)	(3.10)	(3.61)
L.FXReturns	**0.000**	**-0.001**	**0.000**	**0.001**	**0.004**	**0.002****	**-0.000**	**0.001**	**0.001****	**0.001**	**0.022*****	**-0.000**
	(0.13)	(-1.31)	(0.61)	(1.29)	(1.56)	(2.51)	(-0.69)	(1.15)	(2.35)	(1.42)	(11.46)	(-0.25)
L2.FXReturns	-0.001	0.000	-0.001*	-0.001	0.001	-0.001	-0.000	-0.001**	-0.000	-0.000	-0.000	0.001
	(-0.93)	(0.12)	(-1.77)	(-1.34)	(0.44)	(-0.74)	(-1.15)	(-2.23)	(-0.13)	(-0.24)	(-0.17)	(0.91)
L3.FXReturns	-0.000	-0.001**	0.000	0.000	-0.005**	0.000	-0.000*	-0.000	-0.001**	-0.000	0.001	0.001
	(-0.02)	(-2.44)	(0.50)	(0.35)	(-2.08)	(0.02)	(-1.81)	(-0.50)	(-2.38)	(-0.80)	(0.45)	(0.88)
L4.FXReturns	-0.000	-0.000	-0.001	-0.000	0.001	0.000	-0.000	-0.001	0.000	0.000	-0.005***	-0.000
	(-0.54)	(-0.13)	(-0.78)	(-0.10)	(0.39)	(0.29)	(-0.43)	(-1.11)	(0.42)	(0.36)	(-2.66)	(-0.55)
L5.FXReturns	-0.000	0.001	0.000	-0.001	-0.000	-0.003***	-0.000	-0.000	-0.000	-0.000	-0.001	-0.001
	(-0.38)	(1.00)	(0.19)	(-0.66)	(-0.16)	(-3.02)	(-0.93)	(-0.06)	(-0.68)	(-0.81)	(-0.40)	(-1.27)
	Panel C: Controlling for the returns of SP500						Panel D: Controlling for the returns of Nasdaq					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
FXReturns	-0.000	0.001	0.001**	0.000	0.004**	0.002***	-0.000	0.001	0.001**	0.000	0.004**	0.002***
	(-0.32)	(1.44)	(2.29)	(0.26)	(2.43)	(3.64)	(-0.30)	(1.33)	(2.12)	(0.30)	(2.18)	(3.77)
L.FXReturns	**-0.000**	**0.000**	**0.001**	**0.001**	**0.019*****	**-0.000**	**-0.000**	**0.000**	**0.001**	**0.001**	**0.020*****	**-0.000**
	(-0.66)	(0.45)	(1.00)	(1.40)	(10.46)	(-0.09)	(-0.65)	(0.56)	(1.06)	(1.44)	(10.85)	(-0.16)
L2.FXReturns	-0.000	-0.002***	-0.001*	-0.000	-0.002	0.001	-0.000	-0.002***	-0.001	-0.000	-0.002	0.000
	(-1.27)	(-3.31)	(-1.65)	(-0.29)	(-1.19)	(0.78)	(-1.21)	(-3.30)	(-1.30)	(-0.26)	(-0.83)	(0.69)
L3.FXReturns	-0.000*	-0.001*	-0.002***	-0.000	0.001	0.001	-0.000*	-0.001	-0.001**	-0.000	0.001	0.000
	(-1.74)	(-1.80)	(-2.78)	(-0.80)	(0.46)	(0.87)	(-1.80)	(-1.31)	(-2.25)	(-0.80)	(0.52)	(0.72)
L4.FXReturns	-0.000	-0.001**	0.000	0.000	-0.004**	-0.001	-0.000	-0.001**	0.000	0.000	-0.005***	-0.001
	(-0.48)	(-2.04)	(0.27)	(0.38)	(-2.30)	(-0.79)	(-0.50)	(-2.13)	(0.56)	(0.46)	(-2.65)	(-0.77)
L5.FXReturns	-0.000	-0.000	-0.000	-0.000	-0.001	-0.001	-0.000	-0.000	-0.000	-0.000	-0.001	-0.001*
	(-0.95)	(-0.54)	(-0.71)	(-0.80)	(-0.49)	(-1.62)	(-0.97)	(-0.28)	(-0.67)	(-0.79)	(-0.42)	(-1.66)
	Panel E: Controlling for the returns of Philadelphia Semiconductor index						Panel F: Controlling for the returns of MSCIWorld					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
FXReturns	-0.000	0.001	0.001**	0.000	0.004**	0.002***	-0.000	0.000	0.001**	0.000	0.004**	0.002***
	(-0.33)	(1.28)	(2.05)	(0.35)	(2.00)	(3.66)	(-0.26)	(1.06)	(2.11)	(0.29)	(2.17)	(3.76)
L.FXReturns	**-0.000**	**0.001**	**0.001**	**0.001**	**0.021*****	**-0.000**	**-0.000**	**0.000**	**0.000**	**0.001**	**0.018*****	**-0.000**
	(-0.70)	(1.26)	(1.44)	(1.49)	(11.14)	(-0.36)	(-0.62)	(0.06)	(0.75)	(1.38)	(9.54)	(-0.18)
L2.FXReturns	-0.000	-0.001***	-0.001	-0.000	-0.001	0.000	-0.000	-0.002***	-0.002**	-0.000	-0.004**	-0.000
	(-1.19)	(-3.11)	(-0.86)	(-0.17)	(-0.30)	(0.66)	(-1.33)	(-4.55)	(-2.53)	(-0.21)	(-2.18)	(-0.12)
L3.FXReturns	-0.000*	-0.001	-0.001**	-0.000	0.001	0.000	-0.000*	-0.001*	-0.002***	-0.000	0.001	0.001
	(-1.85)	(-1.21)	(-2.22)	(-0.71)	(0.49)	(0.67)	(-1.75)	(-1.69)	(-2.77)	(-0.77)	(0.53)	(1.43)
L4.FXReturns	-0.000	-0.001**	0.000	0.000	-0.005***	-0.000	-0.000	-0.001**	0.000	0.000	-0.005**	-0.001
	(-0.54)	(-2.55)	(0.51)	(0.43)	(-2.77)	(-0.65)	(-0.50)	(-2.54)	(0.20)	(0.41)	(-2.48)	(-1.16)
L5.FXReturns	-0.000	0.000	-0.000	-0.000	-0.001	-0.001	-0.000	-0.000	-0.001	-0.000	-0.001	-0.001
	(-0.99)	(0.13)	(-0.50)	(-0.81)	(-0.58)	(-1.28)	(-0.92)	(-0.58)	(-1.02)	(-0.80)	(-0.38)	(-1.52)

(Cont.)

	Panel G: Controlling for the returns of MSCIEM						Panel H: Controlling for the VIX					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
FXReturns	-0.000	0.000	0.001*	0.000	0.003	0.002***	-0.000	0.001	0.001**	0.000	0.006***	0.002***
	(-0.30)	(0.70)	(1.88)	(0.30)	(1.52)	(3.55)	(-0.27)	(1.59)	(2.21)	(0.32)	(3.12)	(3.61)
L.FXReturns	**-0.000**	**-0.000**	**-0.000**	**0.001**	**0.015*** **	**-0.001***	**-0.000**	**0.001**	**0.001** **	**0.001**	**0.022*** **	**-0.000**
	(-0.85)	(-0.23)	(-0.21)	(1.29)	(8.15)	(-1.68)	(-0.63)	(1.19)	(2.31)	(1.42)	(11.48)	(-0.25)
L2.FXReturns	-0.000	-0.002***	-0.002***	-0.000	-0.004**	0.000	-0.000	-0.001**	-0.000	-0.000	-0.000	0.001
	(-1.47)	(-4.56)	(-2.83)	(-0.34)	(-2.14)	(0.48)	(-1.13)	(-2.26)	(-0.16)	(-0.29)	(-0.11)	(0.89)
L3.FXReturns	-0.000*	-0.001**	-0.002***	-0.000	0.000	0.001	-0.000*	-0.000	-0.001**	-0.000	0.001	0.001
	(-1.66)	(-2.04)	(-2.80)	(-0.43)	(0.10)	(1.12)	(-1.78)	(-0.49)	(-2.40)	(-0.76)	(0.50)	(0.87)
L4.FXReturns	-0.000	-0.002***	-0.000	0.000	-0.006***	-0.001	-0.000	-0.001	0.000	0.000	-0.005***	-0.000
	(-0.63)	(-3.27)	(-0.72)	(0.54)	(-3.00)	(-1.06)	(-0.40)	(-1.11)	(0.41)	(0.33)	(-2.62)	(-0.53)
L5.FXReturns	-0.000	-0.000	-0.001	-0.000	-0.001	-0.001	-0.000	-0.000	-0.000	-0.000	-0.001	-0.001
	(-1.03)	(-0.59)	(-1.19)	(-0.69)	(-0.62)	(-1.55)	(-0.95)	(-0.12)	(-0.72)	(-0.82)	(-0.35)	(-1.28)
	Panel I: Scaling flows by the trading volume						Panel J: Scaling flows by the average of absolute flows of the previous 21 trading days					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
FXReturns	0.112	0.542***	0.131***	4.005***	7.953***	0.001***	3.538***	13.915***	16.535***	20.321***	134.783***	15.493***
	(0.82)	(7.59)	(4.96)	(4.15)	(20.13)	(4.53)	(2.78)	(8.36)	(6.02)	(3.59)	(19.55)	(4.42)
L.FXReturns	**0.200**	**0.018**	**0.030**	**0.330**	**0.609**	**0.000***	**-0.331**	**-0.953**	**3.514**	**1.462**	**9.748**	**11.770*** **
	(1.44)	(0.25)	(1.10)	(0.33)	(1.44)	(1.89)	(-0.26)	(-0.55)	(1.22)	(0.25)	(1.32)	(3.31)
L2.FXReturns	-0.066	0.022	-0.038	-1.008	0.294	-0.000	-1.100	0.581	-4.617	-7.436	7.340	2.914
	(-0.48)	(0.29)	(-1.37)	(-0.99)	(0.69)	(-0.83)	(-0.85)	(0.33)	(-1.60)	(-1.25)	(0.99)	(0.82)
L3.FXReturns	-0.320**	-0.102	0.013	0.398	-0.788*	-0.000	0.280	-1.757	2.397	3.140	-11.443	1.742
	(-2.32)	(-1.36)	(0.48)	(0.39)	(-1.86)	(-0.88)	(0.22)	(-1.00)	(0.83)	(0.53)	(-1.55)	(0.49)
L4.FXReturns	-0.092	-0.016	-0.032	-1.289	-0.137	-0.000	-0.828	2.084	-1.601	-1.106	0.042	-1.320
	(-0.67)	(-0.21)	(-1.14)	(-1.27)	(-0.32)	(-0.77)	(-0.64)	(1.19)	(-0.56)	(-0.19)	(0.01)	(-0.37)
L5.FXReturns	-0.083	0.029	0.012	-0.273	-0.471	-0.001***	-0.163	2.554	0.587	1.492	-1.937	-3.680
	(-0.60)	(0.39)	(0.45)	(-0.27)	(-1.11)	(-2.59)	(-0.13)	(1.45)	(0.20)	(0.25)	(-0.26)	(-1.05)
	Panel K: Scaling flows by the average of absolute flows of the previous 63 trading days						Panel L: Scaling flows by the average of absolute flows of the previous 125 trading days					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
FXReturns	2.783**	14.148***	16.894***	21.515***	133.592***	20.284***	2.692**	14.038***	17.010***	21.048***	134.556***	26.369***
	(2.13)	(8.56)	(6.18)	(3.55)	(19.60)	(5.42)	(2.12)	(8.39)	(6.22)	(3.27)	(19.74)	(6.34)
L.FXReturns	**-0.215**	**-1.055**	**2.945**	**1.302**	**5.738**	**14.097*** **	**-0.438**	**-1.091**	**2.631**	**3.652**	**3.947**	**19.334*** **
	(-0.16)	(-0.61)	(1.03)	(0.21)	(0.79)	(3.71)	(-0.34)	(-0.62)	(0.92)	(0.55)	(0.54)	(4.59)
L2.FXReturns	-1.804	0.800	-4.944*	-9.094	4.760	4.616	-2.008	0.888	-5.448*	-8.987	5.022	1.603
	(-1.36)	(0.46)	(-1.72)	(-1.42)	(0.65)	(1.22)	(-1.55)	(0.50)	(-1.90)	(-1.33)	(0.69)	(0.38)
L3.FXReturns	0.126	-1.983	2.911	0.730	-15.131**	2.451	0.284	-2.273	2.829	1.184	-16.213**	-2.411
	(0.09)	(-1.13)	(1.01)	(0.11)	(-2.07)	(0.64)	(0.22)	(-1.28)	(0.98)	(0.17)	(-2.22)	(-0.57)
L4.FXReturns	-0.938	1.734	-1.409	-2.244	-0.183	0.092	-0.356	1.201	-2.079	-5.561	-1.486	1.255
	(-0.71)	(1.00)	(-0.49)	(-0.35)	(-0.02)	(0.02)	(-0.28)	(0.68)	(-0.72)	(-0.82)	(-0.20)	(0.30)
L5.FXReturns	-0.076	2.319	1.013	-3.045	-1.873	-2.703	-0.236	1.921	0.442	-5.302	-2.907	-3.517
	(-0.06)	(1.33)	(0.35)	(-0.48)	(-0.26)	(-0.71)	(-0.18)	(1.09)	(0.15)	(-0.78)	(-0.40)	(-0.83)

Appendix 3D. Explanatory power of expected equity local returns on foreign equity flows. This table shows the results from various robustness tests on the explanatory power of expected equity local returns on foreign equity flows, based on the flows equation for a bivariate structural vector autoregressive models (SVAR) of foreign equity flows and expected equity local returns with FX returns as an exogenous variable. The VAR is structural as we include contemporaneous expected equity local returns in the flows equation. The L. is the lag operator. We report t-statistics computed using maximum likelihood estimates of covariance matrix in parentheses, while *, ** and *** indicates statistical significance at the 10%, 5% and 1% level, respectively.

	Panel A: Without winsorization						Panel B: Using 1-day lagged flows					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
ExpectedEquityLocalReturns	**0.022*** **	**0.037*** **	**0.016*** **	**0.009*** **	**0.044**	**0.113*** **	**0.028*** **	**0.007*** **	**0.014*** **	**0.008*** **	**0.191*** **	**0.080*** **
	(4.67)	(12.71)	(8.48)	(4.47)	(1.53)	(16.81)	(18.05)	(2.80)	(9.01)	(6.68)	(31.40)	(26.87)
L.ExpectedEquityLocalReturns	0.005	-0.004	-0.009***	0.004**	0.002	-0.062***	0.013***	0.037***	0.012***	0.007***	0.023***	0.018***
	(1.08)	(-1.31)	(-5.02)	(1.99)	(0.08)	(-8.54)	(8.08)	(13.98)	(7.61)	(6.47)	(3.54)	(5.07)
L2.ExpectedEquityLocalReturns	0.009*	-0.002	-0.006***	0.003*	0.021	0.051***	0.011***	-0.006**	-0.010***	0.004***	0.006	0.000
	(1.77)	(-0.85)	(-3.46)	(1.77)	(1.04)	(6.49)	(6.39)	(-2.48)	(-6.35)	(4.03)	(1.00)	(0.06)
L3.ExpectedEquityLocalReturns	0.001	0.002	-0.001	0.005**	-0.026*	-0.021***	0.009***	-0.004	-0.007***	0.004***	0.040***	0.018***
	(0.16)	(0.64)	(-0.56)	(2.41)	(-1.80)	(-2.68)	(5.59)	(-1.59)	(-4.16)	(3.57)	(7.48)	(4.70)
L4.ExpectedEquityLocalReturns	0.006	0.012***	0.003	0.002	0.007	0.001	0.004***	0.006**	0.003*	0.005***	0.051***	-0.010***
	(1.16)	(4.21)	(1.54)	(1.17)	(0.69)	(0.17)	(2.67)	(2.53)	(1.81)	(4.43)	(9.07)	(-2.79)
L5.ExpectedEquityLocalReturns	-0.001	0.005**	-0.002	0.004*	0.010	0.007**	0.006***	0.014***	0.002	0.003***	0.005	0.007**
	(-0.29)	(2.10)	(-1.24)	(1.92)	(1.06)	(2.20)	(3.56)	(5.77)	(1.18)	(3.27)	(0.98)	(2.24)
	Panel C: Controlling for the returns of SP500						Panel D: Controlling for the returns of Nasdaq					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
ExpectedEquityLocalReturns	**0.027*** **	**0.004**	**0.011*** **	**0.007*** **	**0.157*** **	**0.072*** **	**0.027*** **	**0.002**	**0.011*** **	**0.007*** **	**0.154*** **	**0.074*** **
	(16.47)	(1.62)	(7.12)	(6.09)	(25.33)	(23.55)	(16.87)	(0.83)	(6.55)	(6.20)	(24.97)	(24.16)
L.ExpectedEquityLocalReturns	0.013***	0.032***	0.011***	0.007***	0.010	0.017***	0.013***	0.032***	0.011***	0.007***	0.010	0.018***
	(7.81)	(12.87)	(6.76)	(5.72)	(1.62)	(4.75)	(7.76)	(13.08)	(6.83)	(5.99)	(1.61)	(5.00)
L2.ExpectedEquityLocalReturns	0.010***	-0.007***	-0.009***	0.004***	-0.001	0.000	0.010***	-0.006**	-0.009***	0.004***	-0.001	-0.000
	(5.73)	(-2.92)	(-5.84)	(3.55)	(-0.11)	(0.04)	(5.87)	(-2.53)	(-5.36)	(3.62)	(-0.21)	(-0.06)
L3.ExpectedEquityLocalReturns	0.009***	-0.003	-0.006***	0.003***	0.033***	0.016***	0.009***	-0.001	-0.006***	0.004***	0.031***	0.017***
	(5.04)	(-1.30)	(-3.72)	(3.11)	(6.25)	(4.16)	(5.03)	(-0.48)	(-3.58)	(3.43)	(6.02)	(4.33)
L4.ExpectedEquityLocalReturns	0.004**	0.004*	0.002	0.005***	0.038***	-0.009***	0.004**	0.004*	0.002	0.005***	0.035***	-0.009***
	(2.45)	(1.82)	(1.53)	(4.33)	(6.99)	(-2.60)	(2.54)	(1.81)	(1.06)	(4.34)	(6.51)	(-2.64)
L5.ExpectedEquityLocalReturns	0.006***	0.011***	0.001	0.003***	-0.001	0.005*	0.005***	0.011***	0.001	0.003***	-0.002	0.005*
	(3.47)	(4.64)	(0.97)	(3.10)	(-0.25)	(1.76)	(3.43)	(4.82)	(0.86)	(3.18)	(-0.33)	(1.69)
	Panel E: Controlling for the returns of Philadelphia Semiconductor index						Panel F: Controlling for the returns of MSCIWorld					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
ExpectedEquityLocalReturns	**0.027*** **	**0.001**	**0.011*** **	**0.007*** **	**0.158*** **	**0.077*** **	**0.027*** **	**0.007*** **	**0.011*** **	**0.007*** **	**0.159*** **	**0.071*** **
	(17.25)	(0.35)	(6.98)	(6.42)	(25.83)	(25.35)	(16.41)	(2.93)	(7.03)	(6.14)	(25.33)	(22.70)
L.ExpectedEquityLocalReturns	0.013***	0.033***	0.011***	0.007***	0.010	0.018***	0.012***	0.028***	0.010***	0.007***	0.005	0.014***
	(7.79)	(13.45)	(7.11)	(6.28)	(1.58)	(4.99)	(7.28)	(11.26)	(6.24)	(5.83)	(0.76)	(3.83)
L2.ExpectedEquityLocalReturns	0.010***	-0.005**	-0.009***	0.004***	0.000	-0.000	0.010***	-0.005**	-0.009***	0.004***	0.001	0.004
	(6.13)	(-1.97)	(-5.48)	(3.92)	(0.08)	(-0.06)	(5.84)	(-2.12)	(-5.73)	(3.64)	(0.23)	(0.97)
L3.ExpectedEquityLocalReturns	0.009***	-0.001	-0.006***	0.004***	0.033***	0.017***	0.008***	-0.003	-0.006***	0.003***	0.033***	0.013***
	(5.08)	(-0.46)	(-3.74)	(3.46)	(6.35)	(4.42)	(4.86)	(-1.49)	(-3.58)	(3.00)	(6.22)	(3.26)
L4.ExpectedEquityLocalReturns	0.004***	0.004	0.002	0.005***	0.036***	-0.010***	0.004**	0.005**	0.002	0.005***	0.036***	-0.007**
	(2.60)	(1.62)	(1.06)	(4.40)	(6.75)	(-2.79)	(2.34)	(2.05)	(1.41)	(4.23)	(6.66)	(-2.19)
L5.ExpectedEquityLocalReturns	0.005***	0.011***	0.001	0.003***	-0.002	0.006*	0.005***	0.010***	0.001	0.003***	-0.002	0.005
	(3.42)	(5.01)	(1.02)	(3.26)	(-0.29)	(1.96)	(3.35)	(4.20)	(0.94)	(3.13)	(-0.35)	(1.49)

(Cont.)

	Panel G: Controlling for the returns of MSCIEM						Panel H: Controlling for the VIX					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
ExpectedEquityLocalReturns	**0.026*** **	**0.001**	**0.009*** **	**0.007*** **	**0.119*** **	**0.060*** **	**0.028*** **	**0.007*** **	**0.014*** **	**0.008*** **	**0.191*** **	**0.080*** **
	(14.38)	(0.44)	(4.84)	(5.55)	(16.27)	(17.74)	(18.11)	(2.66)	(9.01)	(6.68)	(31.35)	(26.85)
L.ExpectedEquityLocalReturns	0.011***	0.027***	0.010***	0.006***	0.004	0.022***	0.013***	0.037***	0.012***	0.007***	0.023***	0.018***
	(6.03)	(9.85)	(5.31)	(5.16)	(0.54)	(5.61)	(8.08)	(13.86)	(7.64)	(6.43)	(3.53)	(5.08)
L2.ExpectedEquityLocalReturns	0.010***	-0.004	-0.008***	0.004***	0.005	-0.002	0.011***	-0.007**	-0.010***	0.004***	0.006	0.000
	(5.56)	(-1.44)	(-4.49)	(3.35)	(0.78)	(-0.49)	(6.47)	(-2.56)	(-6.31)	(3.94)	(1.02)	(0.07)
L3.ExpectedEquityLocalReturns	0.008***	-0.003	-0.007***	0.003***	0.019***	0.016***	0.009***	-0.004	-0.006***	0.004***	0.040***	0.018***
	(4.16)	(-1.03)	(-3.81)	(2.82)	(3.53)	(3.81)	(5.62)	(-1.61)	(-4.11)	(3.56)	(7.47)	(4.65)
L4.ExpectedEquityLocalReturns	0.004*	0.003	0.001	0.004***	0.018***	-0.009**	0.004***	0.006**	0.003*	0.005***	0.050***	-0.009***
	(1.95)	(1.27)	(0.62)	(3.76)	(3.22)	(-2.44)	(2.74)	(2.41)	(1.82)	(4.36)	(9.06)	(-2.75)
L5.ExpectedEquityLocalReturns	0.005***	0.009***	0.001	0.003***	-0.002	0.006**	0.006***	0.014***	0.002	0.003***	0.006	0.007**
	(3.26)	(4.09)	(0.97)	(2.95)	(-0.36)	(1.99)	(3.57)	(5.64)	(1.20)	(3.23)	(1.01)	(2.24)

	Panel I: Scaling flows by the trading volume						Panel J: Scaling flows by the average of absolute flows of the previous 21 trading days					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
ExpectedEquityLocalReturns	**0.001**	**0.026*** **	**0.051*** **	**0.001*** **	**0.014*** **	**4.956*** **	**8.352*** **	**4.666*** **	**0.504*** **	**16.785*** **	**12.428*** **	**0.038*** **
	(0.82)	(7.59)	(4.96)	(4.15)	(20.13)	(4.53)	(8.28)	(11.72)	(6.74)	(6.70)	(2.98)	(13.09)
L.ExpectedEquityLocalReturns	-0.000	-0.003	0.010	-0.000	-0.002**	2.631**	1.689*	-0.097	-0.380***	6.264**	1.736	-0.016***
	(-0.27)	(-0.75)	(0.95)	(-0.43)	(-2.30)	(2.14)	(1.65)	(-0.24)	(-4.98)	(2.50)	(0.44)	(-5.29)
L2.ExpectedEquityLocalReturns	0.002	0.001	-0.003	-0.000	0.000	-0.336	2.253**	-0.260	-0.259***	8.268***	3.660	0.012***
	(1.08)	(0.14)	(-0.32)	(-0.02)	(0.28)	(-0.27)	(2.19)	(-0.68)	(-3.47)	(3.47)	(1.14)	(4.42)
L3.ExpectedEquityLocalReturns	0.004**	0.004	0.024**	-0.000	-0.000	-2.926**	0.126	0.085	-0.032	5.957**	-2.132	0.001
	(2.05)	(0.98)	(2.21)	(-0.38)	(-0.39)	(-2.37)	(0.12)	(0.22)	(-0.43)	(2.51)	(-1.14)	(0.33)
L4.ExpectedEquityLocalReturns	-0.002	0.004	-0.011	0.000	-0.002**	0.182	2.686***	1.573***	0.041	5.888**	0.634	-0.008***
	(-1.06)	(1.20)	(-1.03)	(1.13)	(-2.24)	(0.15)	(2.64)	(4.06)	(0.54)	(2.41)	(0.36)	(-4.19)
L5.ExpectedEquityLocalReturns	0.001	-0.002	-0.004	0.000	-0.001	-0.349	-0.488	0.678*	-0.004	5.348**	0.386	-0.001
	(0.37)	(-0.65)	(-0.39)	(1.54)	(-1.32)	(-0.31)	(-0.51)	(1.89)	(-0.06)	(2.27)	(0.27)	(-1.26)

	Panel K: Scaling flows by the average of absolute flows of the previous 63 trading days						Panel L: Scaling flows by the average of absolute flows of the previous 125 trading days					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
ExpectedEquityLocalReturns	**93.573*** **	**122.773*** **	**57.625*** **	**133.924*** **	**403.054*** **	**573.417*** **	**97.293*** **	**115.853*** **	**61.891*** **	**126.594*** **	**176.916** **	**730.985*** **
	(10.37)	(12.46)	(7.31)	(9.11)	(5.34)	(17.78)	(10.34)	(12.09)	(7.34)	(7.87)	(2.23)	(17.65)
L.ExpectedEquityLocalReturns	13.510	-3.425	-36.362***	57.388***	-11.148	-258.278***	15.419	-7.260	-38.312***	57.165***	41.262	-271.479***
	(1.46)	(-0.35)	(-4.54)	(3.87)	(-0.15)	(-7.48)	(1.60)	(-0.75)	(-4.47)	(3.53)	(0.55)	(-6.35)
L2.ExpectedEquityLocalReturns	25.553***	-9.920	-28.288***	55.987***	72.302	216.220***	28.525***	-8.518	-34.427***	55.602***	40.019	328.299***
	(2.74)	(-1.05)	(-3.63)	(3.98)	(1.14)	(6.14)	(2.93)	(-0.92)	(-4.16)	(3.65)	(0.79)	(7.34)
L3.ExpectedEquityLocalReturns	-8.370	4.557	-5.616	26.917*	-23.409	-125.645***	-8.192	2.650	-3.527	35.264**	-23.853	-143.445***
	(-0.90)	(0.48)	(-0.72)	(1.91)	(-0.53)	(-4.07)	(-0.84)	(0.29)	(-0.42)	(2.32)	(-0.71)	(-3.50)
L4.ExpectedEquityLocalReturns	22.316**	39.551***	8.123	51.626***	39.313	-50.916**	19.565**	38.631***	13.326	49.427***	28.897	-43.977
	(2.43)	(4.13)	(1.03)	(3.59)	(1.14)	(-2.10)	(2.03)	(4.11)	(1.59)	(3.16)	(0.96)	(-1.57)
L5.ExpectedEquityLocalReturns	-10.205	8.499	-2.304	38.472***	14.863	29.467**	-11.968	6.820	-0.385	38.069**	13.767	16.244
	(-1.14)	(0.94)	(-0.33)	(2.72)	(0.51)	(2.48)	(-1.28)	(0.78)	(-0.05)	(2.49)	(0.53)	(1.34)

Appendix 3E. Explanatory power of expected FX returns on foreign equity flows.

This table shows the results from various robustness tests on the explanatory power of expected FX returns on foreign equity flows, based on the flows equation for a bivariate structural vector autoregressive models (SVAR) of foreign equity flows and expected FX returns with equity local returns as an exogenous variable. The VAR is structural as we include contemporaneous expected FX returns in the flows equation. The L. is the lag operator. We report t-statistics computed using maximum likelihood estimates of covariance matrix in parentheses, while *, ** and *** indicates statistical significance at the 10%, 5% and 1% level, respectively.

	Panel A: Without winsorization						Panel B: Using 1-day lagged flows					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
ExpectedFXReturns	**-0.005**	**0.000**	**-0.001**	**-0.000**	**0.099****	**0.013****	**-0.002**	**0.008*****	**-0.000**	**-0.004**	**0.102*****	**0.001**
	(-0.69)	(0.03)	(-0.08)	(-0.01)	(2.55)	(2.36)	(-0.86)	(2.84)	(-0.00)	(-0.73)	(3.49)	(0.12)
L.ExpectedFXReturns	-0.000	0.005	0.008	0.000	-0.098***	-0.009*	-0.004	-0.005*	-0.016	-0.006	0.019	0.004
	(-0.03)	(1.35)	(0.39)	(0.01)	(-2.59)	(-1.67)	(-1.47)	(-1.67)	(-0.91)	(-1.08)	(0.62)	(0.98)
L2.ExpectedFXReturns	-0.007	-0.002	-0.031	0.002	0.038	-0.002	-0.002	-0.002	-0.010	-0.008	0.015	0.002
	(-0.90)	(-0.52)	(-1.59)	(0.15)	(0.96)	(-0.45)	(-0.81)	(-0.59)	(-0.67)	(-1.54)	(0.49)	(0.45)
L3.ExpectedFXReturns	-0.005	0.002	-0.029*	0.027***	-0.074**	0.003	-0.005**	-0.001	-0.032**	0.005	-0.016	-0.000
	(-0.68)	(0.64)	(-1.81)	(2.64)	(-1.98)	(0.61)	(-2.14)	(-0.18)	(-2.34)	(1.07)	(-0.52)	(-0.01)
L4.ExpectedFXReturns	0.001	-0.004	0.009	0.001	-0.014	-0.018***	-0.001	0.005*	-0.022**	0.014***	-0.046	-0.001
	(0.12)	(-1.12)	(0.85)	(0.09)	(-0.39)	(-3.39)	(-0.60)	(1.82)	(-2.17)	(2.90)	(-1.62)	(-0.27)
L5.ExpectedFXReturns	0.004	0.011***	0.014	-0.001	0.027	0.007	0.003	0.002	0.005	0.003	-0.002	-0.005
	(0.57)	(3.47)	(1.50)	(-0.07)	(1.06)	(1.51)	(1.33)	(0.80)	(0.51)	(0.73)	(-0.07)	(-1.23)

	Panel C: Controlling for the returns of SP500						Panel D: Controlling for the returns of Nasdaq					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
ExpectedFXReturns	**-0.002**	**0.012*****	**0.006**	**-0.004**	**0.084*****	**0.000**	**-0.002**	**0.012*****	**0.003**	**-0.005**	**0.082*****	**0.000**
	(-0.93)	(4.19)	(0.38)	(-0.69)	(3.00)	(0.09)	(-0.89)	(4.21)	(0.21)	(-0.76)	(2.95)	(0.07)
L.ExpectedFXReturns	-0.003	-0.003	-0.007	-0.006	0.017	0.003	-0.004	-0.003	-0.009	-0.006	0.026	0.003
	(-1.38)	(-0.91)	(-0.38)	(-1.09)	(0.61)	(0.78)	(-1.43)	(-1.22)	(-0.50)	(-1.08)	(0.90)	(0.79)
L2.ExpectedFXReturns	-0.002	-0.001	-0.010	-0.008	-0.002	0.002	-0.002	-0.000	-0.011	-0.008	-0.005	0.002
	(-0.85)	(-0.27)	(-0.68)	(-1.56)	(-0.06)	(0.50)	(-0.87)	(-0.18)	(-0.77)	(-1.59)	(-0.16)	(0.48)
L3.ExpectedFXReturns	-0.005**	-0.004	-0.034**	0.005	-0.011	-0.001	-0.005**	-0.004*	-0.037***	0.005	-0.007	-0.001
	(-2.10)	(-1.43)	(-2.51)	(1.04)	(-0.37)	(-0.25)	(-2.16)	(-1.67)	(-2.72)	(1.04)	(-0.23)	(-0.16)
L4.ExpectedFXReturns	-0.001	0.007***	-0.019*	0.014***	-0.050*	-0.002	-0.001	0.008***	-0.021**	0.014***	-0.049*	-0.002
	(-0.55)	(2.64)	(-1.90)	(2.90)	(-1.83)	(-0.48)	(-0.59)	(2.77)	(-2.05)	(2.90)	(-1.82)	(-0.39)
L5.ExpectedFXReturns	0.003	0.002	0.006	0.003	0.009	-0.005	0.003	0.002	0.007	0.004	0.011	-0.004
	(1.34)	(0.76)	(0.65)	(0.72)	(0.39)	(-1.16)	(1.31)	(0.63)	(0.72)	(0.76)	(0.50)	(-1.11)

	Panel E: Controlling for the returns of Philadelphia Semiconductor index						Panel F: Controlling for the returns of MSCIWorld					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
ExpectedFXReturns	**-0.002**	**0.012*****	**0.001**	**-0.005**	**0.077*****	**0.001**	**-0.002**	**0.015*****	**0.005**	**-0.005**	**0.083*****	**0.001**
	(-0.85)	(4.22)	(0.06)	(-0.80)	(2.77)	(0.13)	(-0.98)	(5.24)	(0.28)	(-0.75)	(2.94)	(0.14)
L.ExpectedFXReturns	-0.004	-0.004	-0.013	-0.006	0.034	0.003	-0.003	-0.004	0.000	-0.006	0.002	-0.000
	(-1.47)	(-1.39)	(-0.73)	(-1.14)	(1.20)	(0.80)	(-1.38)	(-1.31)	(0.02)	(-1.11)	(0.09)	(-0.02)
L2.ExpectedFXReturns	-0.002	-0.000	-0.012	-0.008	-0.004	0.002	-0.002	0.001	-0.004	-0.008	0.004	0.004
	(-0.87)	(-0.00)	(-0.87)	(-1.58)	(-0.13)	(0.47)	(-0.88)	(0.26)	(-0.28)	(-1.58)	(0.13)	(0.86)
L3.ExpectedFXReturns	-0.005**	-0.006**	-0.037***	0.006	-0.003	-0.001	-0.005**	-0.005*	-0.038***	0.005	-0.015	-0.003
	(-2.17)	(-2.08)	(-2.69)	(1.09)	(-0.10)	(-0.22)	(-2.09)	(-1.94)	(-2.79)	(1.06)	(-0.51)	(-0.66)
L4.ExpectedFXReturns	-0.001	0.007***	-0.021**	0.014***	-0.043	-0.001	-0.001	0.009***	-0.020*	0.014***	-0.050*	-0.002
	(-0.64)	(2.67)	(-2.10)	(2.93)	(-1.57)	(-0.23)	(-0.57)	(3.09)	(-1.94)	(2.91)	(-1.83)	(-0.48)
L5.ExpectedFXReturns	0.003	0.001	0.006	0.004	0.009	-0.005	0.003	0.003	0.010	0.003	0.011	-0.003
	(1.30)	(0.49)	(0.67)	(0.75)	(0.39)	(-1.30)	(1.35)	(0.98)	(1.09)	(0.73)	(0.47)	(-0.83)

(Cont.)

	Panel G: Controlling for the returns of MSCIEM						Panel H: Controlling for the VIX					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
ExpectedFXReturns	**-0.002**	**0.016*****	**0.013**	**-0.003**	**0.057****	**-0.005**	**-0.002**	**0.008*****	**0.001**	**-0.004**	**0.102*****	**0.001**
	(-1.00)	(5.61)	(0.77)	(-0.51)	(2.04)	(-1.25)	(-0.87)	(2.88)	(0.05)	(-0.65)	(3.51)	(0.12)
L.ExpectedFXReturns	-0.003	-0.003	0.009	-0.007	0.010	0.001	-0.004	-0.005	-0.015	-0.006	0.021	0.004
	(-1.29)	(-1.18)	(0.50)	(-1.29)	(0.37)	(0.35)	(-1.46)	(-1.64)	(-0.83)	(-1.06)	(0.71)	(0.95)
L2.ExpectedFXReturns	-0.002	0.001	-0.012	-0.009*	-0.008	0.001	-0.002	-0.002	-0.009	-0.008	0.014	0.002
	(-0.95)	(0.32)	(-0.80)	(-1.76)	(-0.28)	(0.17)	(-0.83)	(-0.61)	(-0.59)	(-1.56)	(0.46)	(0.44)
L3.ExpectedFXReturns	-0.005**	-0.007***	-0.044***	0.005	-0.009	-0.003	-0.005**	-0.000	-0.031**	0.005	-0.013	-0.000
	(-2.12)	(-2.63)	(-3.20)	(0.87)	(-0.30)	(-0.62)	(-2.25)	(-0.18)	(-2.28)	(1.05)	(-0.43)	(-0.00)
L4.ExpectedFXReturns	-0.001	0.009***	-0.015	0.014***	-0.043	-0.000	-0.001	0.005*	-0.021**	0.013***	-0.046	-0.001
	(-0.58)	(3.25)	(-1.45)	(2.93)	(-1.62)	(-0.03)	(-0.69)	(1.80)	(-2.12)	(2.80)	(-1.63)	(-0.28)
L5.ExpectedFXReturns	0.002	0.002	0.013	0.004	0.022	-0.005	0.003	0.002	0.005	0.003	-0.001	-0.005
	(1.15)	(0.67)	(1.35)	(0.82)	(0.97)	(-1.19)	(1.28)	(0.73)	(0.51)	(0.68)	(-0.05)	(-1.24)

	Panel I: Scaling flows by the trading volume						Panel J: Scaling flows by the average of absolute flows of the previous 21 trading days					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
ExpectedFXReturns	**0.001**	**0.026*****	**0.051*****	**0.001*****	**0.014*****	**4.956*****	**-1.215**	**0.216**	**0.182**	**8.147**	**12.687***	**0.003****
	(0.82)	(7.59)	(4.96)	(4.15)	(20.13)	(4.53)	(-0.79)	(0.46)	(0.25)	(0.61)	(1.85)	(1.98)
L.ExpectedFXReturns	-0.000	-0.003	0.010	-0.000	-0.002**	2.631**	-2.950*	0.552	0.486	1.445	-21.109***	-0.002*
	(-0.27)	(-0.75)	(0.95)	(-0.43)	(-2.30)	(2.14)	(-1.90)	(1.14)	(0.64)	(0.12)	(-3.10)	(-1.67)
L2.ExpectedFXReturns	0.002	0.001	-0.003	-0.000	0.000	-0.336	-2.162	-0.029	-1.527**	17.579	10.082	-0.001
	(1.08)	(0.14)	(-0.32)	(-0.02)	(0.28)	(-0.27)	(-1.39)	(-0.06)	(-1.99)	(1.46)	(1.39)	(-0.72)
L3.ExpectedFXReturns	0.004**	0.004	0.024**	-0.000	-0.000	-2.926**	-2.534*	0.274	-1.050*	31.222**	-13.594**	-0.000
	(2.05)	(0.98)	(2.21)	(-0.38)	(-0.39)	(-2.37)	(-1.71)	(0.60)	(-1.70)	(2.56)	(-2.02)	(-0.22)
L4.ExpectedFXReturns	-0.002	0.004	-0.011	0.000	-0.002**	0.182	-1.307	-0.400	0.684*	-4.957	-0.690	-0.005***
	(-1.06)	(1.20)	(-1.03)	(1.13)	(-2.24)	(0.15)	(-0.95)	(-0.85)	(1.72)	(-0.42)	(-0.11)	(-3.24)
L5.ExpectedFXReturns	0.001	-0.002	-0.004	0.000	-0.001	-0.349	0.188	1.012**	0.611*	-1.708	2.755	0.001
	(0.37)	(-0.65)	(-0.39)	(1.54)	(-1.32)	(-0.31)	(0.14)	(2.29)	(1.66)	(-0.15)	(0.60)	(1.10)

	Panel K: Scaling flows by the average of absolute flows of the previous 63 trading days						Panel L: Scaling flows by the average of absolute flows of the previous 125 trading days					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
ExpectedFXReturns	**-3.055**	**-3.264**	**-35.329**	**49.192**	**278.456****	**51.311****	**-12.412**	**-2.547**	**-21.632**	**39.993**	**261.542****	**32.672**
	(-0.21)	(-0.30)	(-0.45)	(0.63)	(2.40)	(2.01)	(-0.85)	(-0.24)	(-0.28)	(0.47)	(2.26)	(1.02)
L.ExpectedFXReturns	3.491	5.773	30.136	-2.769	-260.775**	-41.686*	1.832	7.482	40.326	41.632	-257.859**	-61.113*
	(0.24)	(0.51)	(0.36)	(-0.04)	(-2.31)	(-1.65)	(0.12)	(0.67)	(0.49)	(0.50)	(-2.30)	(-1.92)
L2.ExpectedFXReturns	-11.072	-8.832	-82.181	16.916	146.902	7.061	-18.164	-8.298	-93.982	69.207	102.599	30.897
	(-0.78)	(-0.83)	(-0.95)	(0.22)	(1.30)	(0.28)	(-1.25)	(-0.80)	(-1.13)	(0.86)	(0.91)	(0.97)
L3.ExpectedFXReturns	-0.616	10.990	-59.795	104.069	-176.649*	-8.431	-3.680	10.167	-61.446	182.504**	-166.126	-12.029
	(-0.04)	(1.04)	(-0.83)	(1.39)	(-1.67)	(-0.34)	(-0.26)	(0.97)	(-0.87)	(2.27)	(-1.57)	(-0.37)
L4.ExpectedFXReturns	9.634	-6.964	94.696**	9.497	-42.424	-47.810*	1.453	-8.593	90.498**	13.856	-59.203	-23.789
	(0.74)	(-0.63)	(2.18)	(0.13)	(-0.41)	(-1.88)	(0.11)	(-0.80)	(2.20)	(0.18)	(-0.57)	(-0.76)
L5.ExpectedFXReturns	14.188	26.872***	76.619*	11.097	45.781	21.122	6.410	27.570***	72.798*	-45.040	41.455	50.573**
	(1.13)	(2.62)	(1.84)	(0.15)	(0.58)	(0.98)	(0.49)	(2.72)	(1.89)	(-0.59)	(0.55)	(2.16)

Appendix 3F. Explanatory power of unexpected equity local returns on foreign equity flows. This table shows the results from various robustness on the explanatory power of expected equity local returns on foreign equity flows, based on the flows equation for a bivariate structural vector autoregressive models (SVAR) of foreign equity flows and unexpected equity local returns with FX returns as an exogenous variable. The VAR is structural as we include contemporaneous unexpected equity local returns in the flows equation. The L. is the lag operator. We report t-statistics computed using maximum likelihood estimates of covariance matrix in parentheses, while *, ** and *** indicates statistical significance at the 10%, 5% and 1% level, respectively.

	Panel A: Without winsorization						Panel B: Using 1-day lagged flows					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
UnexpectedEquityLocalReturns	**0.004*** **	**0.006*** **	**0.002*** **	**0.002*** **	**0.014*** **	**0.006*** **	**-0.000**	**0.001*** **	**0.001** **	**-0.000**	**0.001*** **	**0.001*** **
	(6.30)	(21.06)	(10.12)	(6.15)	(38.11)	(27.42)	(-0.67)	(2.69)	(2.44)	(-0.32)	(3.84)	(6.69)
L.UnexpectedEquityLocalReturns	0.003***	0.006***	0.002***	0.002***	0.004***	0.005***	0.004***	0.005***	0.002***	0.001***	0.012***	0.006***
	(4.66)	(18.75)	(8.69)	(6.05)	(8.50)	(18.31)	(18.27)	(20.55)	(9.08)	(9.12)	(34.40)	(26.31)
L2.UnexpectedEquityLocalReturns	0.001*	-0.001***	-0.001***	0.001***	0.001	-0.001*	0.003***	0.005***	0.002***	0.001***	0.004***	0.005***
	(1.85)	(-3.66)	(-3.48)	(3.28)	(1.22)	(-1.94)	(10.69)	(18.99)	(9.71)	(8.56)	(10.22)	(20.60)
L3.UnexpectedEquityLocalReturns	0.001	-0.001***	-0.001***	0.001**	0.001	-0.001**	0.001***	-0.001***	-0.001***	0.001***	0.001**	-0.000
	(1.28)	(-2.87)	(-2.91)	(2.04)	(1.11)	(-2.41)	(4.01)	(-3.88)	(-4.09)	(4.16)	(2.28)	(-1.63)
L4.UnexpectedEquityLocalReturns	-0.000	-0.001**	-0.000	0.001**	-0.000	-0.001***	0.000	-0.001***	-0.001***	0.000***	0.001*	-0.001***
	(-0.45)	(-2.14)	(-0.07)	(2.54)	(-1.06)	(-3.94)	(1.23)	(-3.11)	(-3.59)	(2.76)	(1.82)	(-3.07)
L5.UnexpectedEquityLocalReturns	-0.000	-0.001***	-0.000	0.000	-0.001	-0.001***	-0.001***	-0.001***	-0.000	0.000	-0.000	-0.001***
	(-0.01)	(-2.79)	(-0.96)	(0.18)	(-1.59)	(-3.23)	(-2.78)	(-2.70)	(-0.52)	(1.40)	(-0.94)	(-4.89)
	Panel C: Controlling for the returns of SP500						Panel D: Controlling for the returns of Nasdaq					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
UnexpectedEquityLocalReturns	**-0.000**	**0.001** **	**0.001*** **	**-0.000**	**0.001*** **	**0.001*** **	**-0.000**	**0.001** **	**0.001** **	**-0.000**	**0.001** **	**0.001*** **
	(-0.74)	(2.32)	(2.60)	(-0.49)	(3.16)	(6.52)	(-0.78)	(2.35)	(2.43)	(-0.35)	(2.33)	(6.52)
L.UnexpectedEquityLocalReturns	0.004***	0.004***	0.002***	0.001***	0.011***	0.005***	0.004***	0.004***	0.001***	0.001***	0.010***	0.005***
	(16.59)	(14.78)	(7.19)	(8.48)	(28.15)	(23.25)	(17.01)	(13.84)	(6.64)	(8.65)	(27.53)	(23.80)
L2.UnexpectedEquityLocalReturns	0.002***	0.004***	0.002***	0.001***	0.003***	0.004***	0.002***	0.004***	0.002***	0.001***	0.003***	0.004***
	(10.10)	(16.01)	(8.33)	(7.77)	(7.58)	(18.62)	(10.13)	(16.22)	(8.22)	(8.10)	(7.55)	(19.20)
L3.UnexpectedEquityLocalReturns	0.001***	-0.001***	-0.001***	0.001***	0.001	-0.000	0.001***	-0.001***	-0.001***	0.001***	0.001	-0.000
	(3.54)	(-4.90)	(-3.98)	(3.87)	(1.58)	(-1.45)	(3.60)	(-4.61)	(-3.56)	(3.92)	(1.57)	(-1.47)
L4.UnexpectedEquityLocalReturns	0.000	-0.001**	-0.001***	0.000***	0.001*	-0.001***	0.000	-0.001*	-0.001***	0.000***	0.001	-0.001***
	(0.87)	(-2.44)	(-3.39)	(2.69)	(1.81)	(-3.03)	(0.82)	(-1.92)	(-3.25)	(2.90)	(1.53)	(-3.07)
L5.UnexpectedEquityLocalReturns	-0.001***	-0.001***	-0.000	0.000	-0.000	-0.001***	-0.001***	-0.001***	-0.000	0.000	-0.000	-0.001***
	(-2.84)	(-2.80)	(-0.67)	(1.42)	(-0.77)	(-4.69)	(-2.81)	(-3.19)	(-0.94)	(1.43)	(-1.15)	(-4.61)
	Panel E: Controlling for the returns of Philadelphia Semiconductor index						Panel F: Controlling for the returns of MSCIWorld					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
UnexpectedEquityLocalReturns	**-0.000**	**0.000**	**0.001** **	**-0.000**	**0.001** **	**0.001*** **	**-0.000**	**0.001** **	**0.000** **	**-0.000**	**0.001** **	**0.001*** **
	(-0.71)	(1.41)	(2.38)	(-0.25)	(2.21)	(6.45)	(-0.67)	(2.05)	(2.28)	(-0.44)	(2.42)	(6.04)
L.UnexpectedEquityLocalReturns	0.004***	0.004***	0.002***	0.001***	0.011***	0.005***	0.004***	0.004***	0.002***	0.001***	0.011***	0.005***
	(17.41)	(14.00)	(7.07)	(8.91)	(28.40)	(24.91)	(16.45)	(14.47)	(7.13)	(8.49)	(27.98)	(22.51)
L2.UnexpectedEquityLocalReturns	0.002***	0.005***	0.002***	0.001***	0.003***	0.005***	0.002***	0.004***	0.002***	0.001***	0.003***	0.004***
	(10.24)	(17.01)	(8.60)	(8.42)	(7.57)	(19.78)	(9.51)	(13.66)	(7.73)	(7.93)	(6.73)	(17.07)
L3.UnexpectedEquityLocalReturns	0.001***	-0.001***	-0.001***	0.001***	0.001*	-0.000	0.001***	-0.001***	-0.001***	0.001***	0.001*	-0.000
	(3.81)	(-4.01)	(-3.53)	(4.17)	(1.70)	(-1.56)	(3.54)	(-4.52)	(-3.96)	(3.96)	(1.81)	(-0.82)
L4.UnexpectedEquityLocalReturns	0.000	-0.001**	-0.001***	0.000***	0.001	-0.001***	0.000	-0.001***	-0.001***	0.000***	0.001*	-0.001***
	(0.86)	(-2.02)	(-3.33)	(2.81)	(1.54)	(-3.18)	(0.81)	(-2.98)	(-3.30)	(2.59)	(1.74)	(-3.17)
L5.UnexpectedEquityLocalReturns	-0.001***	-0.001***	-0.000	0.000	-0.000	-0.001***	-0.001***	-0.001***	-0.000	0.000	-0.000	-0.001***
	(-2.80)	(-3.50)	(-0.99)	(1.38)	(-1.11)	(-4.88)	(-2.81)	(-2.76)	(-0.79)	(1.36)	(-0.97)	(-4.53)

(Cont.)

	Panel G: Controlling for the returns of MSCIEM						Panel H: Controlling for the VIX					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
UnexpectedEquityLocalReturns	**-0.000**	**0.000**	**0.001****	**-0.000**	**0.000**	**0.001*****	**-0.000**	**0.001*****	**0.000****	**-0.000**	**0.001*****	**0.001*****
	(-0.86)	(1.60)	(2.41)	(-0.68)	(1.41)	(6.18)	(-0.63)	(2.77)	(2.42)	(-0.37)	(3.80)	(6.69)
L.UnexpectedEquityLocalReturns	0.004***	0.003***	0.001***	0.001***	0.008***	0.004***	0.004***	0.005***	0.002***	0.001***	0.012***	0.006***
	(14.38)	(8.58)	(4.98)	(7.89)	(18.24)	(17.38)	(18.31)	(20.59)	(9.07)	(9.16)	(34.36)	(26.30)
L2.UnexpectedEquityLocalReturns	0.002***	0.003***	0.002***	0.001***	0.002***	0.004***	0.003***	0.005***	0.002***	0.001***	0.004***	0.005***
	(7.92)	(11.07)	(6.17)	(7.28)	(4.17)	(16.57)	(10.69)	(19.12)	(9.76)	(8.60)	(10.17)	(20.60)
L3.UnexpectedEquityLocalReturns	0.001***	-0.001***	-0.001***	0.001***	0.001***	-0.000	0.001***	-0.001***	-0.001***	0.001***	0.001**	-0.000
	(3.45)	(-4.32)	(-3.30)	(3.98)	(2.62)	(-0.58)	(4.07)	(-3.67)	(-4.03)	(4.13)	(2.29)	(-1.61)
L4.UnexpectedEquityLocalReturns	0.000	-0.001**	-0.001***	0.000***	-0.000	-0.001***	0.000	-0.001***	-0.001***	0.000***	0.001*	-0.001***
	(0.66)	(-2.48)	(-3.77)	(2.74)	(-0.17)	(-2.87)	(1.25)	(-2.91)	(-3.51)	(2.84)	(1.81)	(-3.12)
L5.UnexpectedEquityLocalReturns	-0.001***	-0.001***	-0.000	0.000	-0.001	-0.001***	-0.001***	-0.001**	-0.000	0.000	-0.000	-0.001***
	(-2.58)	(-2.90)	(-1.33)	(1.52)	(-1.08)	(-3.91)	(-2.74)	(-2.53)	(-0.48)	(1.42)	(-0.91)	(-4.88)

	Panel I: Scaling flows by the trading volume						Panel J: Scaling flows by the average of absolute flows of the previous 21 trading days					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
UnexpectedEquityLocalReturns	**0.001**	**0.026*****	**0.051*****	**0.001*****	**0.014*****	**4.956*****	**2.336*****	**0.733*****	**0.086*****	**3.447*****	**2.510*****	**0.002*****
	(0.82)	(7.59)	(4.96)	(4.15)	(20.13)	(4.53)	(17.50)	(19.82)	(9.34)	(10.97)	(38.38)	(25.91)
L.UnexpectedEquityLocalReturns	-0.000	-0.003	0.010	-0.000	-0.002**	2.631**	1.150***	0.649***	0.067***	2.786***	0.458***	0.001***
	(-0.27)	(-0.75)	(0.95)	(-0.43)	(-2.30)	(2.14)	(8.16)	(16.02)	(6.86)	(8.44)	(5.73)	(15.32)
L2.UnexpectedEquityLocalReturns	0.002	0.001	-0.003	-0.000	0.000	-0.336	0.361**	-0.141***	-0.036***	1.210***	0.056	-0.000***
	(1.08)	(0.14)	(-0.32)	(-0.02)	(0.28)	(-0.27)	(2.54)	(-3.38)	(-3.68)	(3.63)	(0.69)	(-2.67)
L3.UnexpectedEquityLocalReturns	0.004**	0.004	0.024**	-0.000	-0.000	-2.926**	0.023	-0.129***	-0.030***	0.933***	0.023	-0.000***
	(2.05)	(0.98)	(2.21)	(-0.38)	(-0.39)	(-2.37)	(0.16)	(-3.09)	(-3.01)	(2.80)	(0.29)	(-3.03)
L4.UnexpectedEquityLocalReturns	-0.002	0.004	-0.011	0.000	-0.002**	0.182	-0.323**	-0.117***	-0.006	0.619*	-0.079	-0.000***
	(-1.06)	(1.20)	(-1.03)	(1.13)	(-2.24)	(0.15)	(-2.27)	(-2.83)	(-0.58)	(1.86)	(-0.99)	(-4.24)
L5.UnexpectedEquityLocalReturns	0.001	-0.002	-0.004	0.000	-0.001	-0.349	-0.046	-0.123***	-0.020**	-0.077	-0.142*	-0.000***
	(0.37)	(-0.65)	(-0.39)	(1.54)	(-1.32)	(-0.31)	(-0.32)	(-3.00)	(-2.08)	(-0.24)	(-1.88)	(-3.89)

	Panel K: Scaling flows by the average of absolute flows of the previous 63 trading days						Panel L: Scaling flows by the average of absolute flows of the previous 125 trading days					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
UnexpectedEquityLocalReturns	**25.013*****	**17.468*****	**10.335*****	**23.895*****	**43.103*****	**24.145*****	**24.454*****	**17.682*****	**10.823*****	**23.773*****	**42.869*****	**25.067*****
	(20.21)	(20.27)	(10.75)	(13.04)	(37.79)	(23.99)	(19.17)	(20.71)	(11.25)	(12.01)	(38.14)	(24.84)
L.UnexpectedEquityLocalReturns	14.184***	17.039***	7.639***	21.758***	11.512***	21.647***	14.388***	16.181***	7.787***	21.936***	10.824***	22.113***
	(10.75)	(18.03)	(7.50)	(11.23)	(8.29)	(19.80)	(10.61)	(17.25)	(7.61)	(10.52)	(7.88)	(20.15)
L2.UnexpectedEquityLocalReturns	4.764***	-2.478**	-3.305***	11.105***	3.423**	-0.066	4.995***	-3.167***	-3.600***	11.675***	2.061	-1.751
	(3.55)	(-2.53)	(-3.22)	(5.64)	(2.44)	(-0.06)	(3.63)	(-3.26)	(-3.49)	(5.52)	(1.49)	(-1.53)
L3.UnexpectedEquityLocalReturns	2.258*	-2.390**	-3.044***	6.152***	2.483*	-1.998*	2.334*	-2.543***	-3.474***	6.894***	1.157	-2.723**
	(1.68)	(-2.44)	(-2.97)	(3.11)	(1.77)	(-1.74)	(1.69)	(-2.62)	(-3.36)	(3.25)	(0.84)	(-2.38)
L4.UnexpectedEquityLocalReturns	-2.842**	-1.920**	-0.555	2.980	-0.547	-3.306***	-3.256**	-2.242**	-0.484	4.124*	-0.666	-3.896***
	(-2.12)	(-1.97)	(-0.54)	(1.51)	(-0.39)	(-2.89)	(-2.36)	(-2.32)	(-0.47)	(1.94)	(-0.48)	(-3.41)
L5.UnexpectedEquityLocalReturns	-0.403	-2.039**	-1.448	0.500	-1.147	-3.368***	-1.089	-2.325**	-1.383	1.000	-1.742	-3.341***
	(-0.30)	(-2.12)	(-1.41)	(0.26)	(-0.86)	(-3.03)	(-0.79)	(-2.45)	(-1.34)	(0.48)	(-1.34)	(-3.01)

Appendix 3G. Explanatory power of unexpected FX returns on foreign equity flows.
This table shows the results from various robustness tests on the explanatory power of unexpected equity local returns on foreign equity flows, based on the flows equation for a bivariate structural vector autoregressive models (SVAR) of foreign equity flows and unexpected FX returns with equity local returns as an exogenous variable. The VAR is structural as we include contemporaneous unexpected FX returns in the flows equation. The SVARs are estimated separately for each country with five lags. The L. is the lag operator. We report t-statistics computed using maximum likelihood estimates of covariance matrix in parentheses, while *, ** and *** indicates statistical significance at the 10%, 5% and 1% level, respectively.

	Panel A: Without winsorization						Panel B: Using 1-day lagged flows					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
UnexpectedFXReturns	**0.001**	**0.003*** **	**0.003*** **	**0.003*** **	**0.044*** **	**0.004*** **	**-0.000**	**0.001* **	**0.001** **	**0.000**	**0.006*** **	**0.003*** **
	(0.89)	(6.54)	(4.35)	(3.62)	(19.64)	(5.29)	(-0.33)	(1.67)	(2.22)	(0.32)	(3.06)	(4.88)
L.UnexpectedFXReturns	0.000	-0.001	0.000	0.001	0.005*	0.003***	-0.000	0.001	0.001**	0.001	0.022***	0.001
	(0.12)	(-1.22)	(0.53)	(1.19)	(1.87)	(3.87)	(-0.70)	(1.47)	(2.36)	(1.54)	(11.53)	(1.22)
L2.UnexpectedFXReturns	-0.001	-0.001	-0.001	-0.001	0.001	0.000	-0.000	-0.001**	-0.000	-0.000	0.000	0.001
	(-0.81)	(-0.92)	(-1.60)	(-1.62)	(0.37)	(0.07)	(-1.13)	(-2.34)	(-0.04)	(-0.19)	(0.23)	(1.51)
L3.UnexpectedFXReturns	0.000	-0.002***	0.000	0.000	-0.006**	-0.001	-0.000	-0.000	-0.001**	-0.000	0.001	0.001
	(0.05)	(-2.90)	(0.41)	(0.16)	(-2.41)	(-0.64)	(-1.64)	(-0.92)	(-2.26)	(-0.94)	(0.41)	(1.01)
L4.UnexpectedFXReturns	-0.000	-0.001	-0.001	-0.000	0.002	0.001	-0.000	-0.001	0.000	0.000	-0.006***	-0.001
	(-0.69)	(-0.93)	(-0.83)	(-0.20)	(0.75)	(0.64)	(-0.46)	(-1.33)	(0.48)	(0.17)	(-2.82)	(-1.00)
L5.UnexpectedFXReturns	-0.000	0.000	0.000	-0.001	0.002	-0.002**	-0.000	-0.000	-0.001	-0.000	-0.000	-0.000
	(-0.49)	(0.05)	(0.07)	(-0.90)	(0.94)	(-2.04)	(-1.35)	(-0.54)	(-0.82)	(-0.92)	(-0.21)	(-0.66)
	Panel C: Controlling for the returns of SP500						Panel D: Controlling for the returns of Nasdaq					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
UnexpectedFXReturns	**-0.000**	**0.001**	**0.001** **	**0.000**	**0.004** **	**0.003*** **	**-0.000**	**0.001**	**0.001** **	**0.000**	**0.004** **	**0.003*** **
	(-0.32)	(1.60)	(2.30)	(0.27)	(2.35)	(4.91)	(-0.31)	(1.48)	(2.13)	(0.31)	(2.04)	(5.06)
L.UnexpectedFXReturns	-0.000	0.000	0.001	0.001	0.020***	0.001	-0.000	0.000	0.001	0.001	0.020***	0.001
	(-0.67)	(0.70)	(1.01)	(1.51)	(10.43)	(1.38)	(-0.66)	(0.78)	(1.08)	(1.56)	(10.77)	(1.34)
L2.UnexpectedFXReturns	-0.000	-0.002***	-0.001	-0.000	-0.002	0.001	-0.000	-0.002***	-0.001	-0.000	-0.001	0.001
	(-1.25)	(-3.42)	(-1.51)	(-0.24)	(-0.81)	(1.39)	(-1.20)	(-3.36)	(-1.17)	(-0.21)	(-0.44)	(1.31)
L3.UnexpectedFXReturns	-0.000	-0.001**	-0.002***	-0.000	0.001	0.001	-0.000	-0.001	-0.001**	-0.000	0.001	0.001
	(-1.57)	(-2.01)	(-2.67)	(-0.93)	(0.43)	(1.00)	(-1.63)	(-1.49)	(-2.14)	(-0.93)	(0.51)	(0.85)
L4.UnexpectedFXReturns	-0.000	-0.001**	0.000	0.000	-0.005**	-0.001	-0.000	-0.001**	0.000	0.000	-0.005***	-0.001
	(-0.52)	(-2.26)	(0.35)	(0.20)	(-2.40)	(-1.28)	(-0.53)	(-2.32)	(0.64)	(0.27)	(-2.71)	(-1.31)
L5.UnexpectedFXReturns	-0.000	-0.000	-0.001	-0.000	-0.001	-0.001	-0.000	-0.000	-0.000	-0.000	-0.001	-0.001
	(-1.36)	(-0.71)	(-0.82)	(-0.90)	(-0.36)	(-1.06)	(-1.39)	(-0.49)	(-0.78)	(-0.90)	(-0.34)	(-1.08)
	Panel E: Controlling for the returns of Philadelphia Semiconductor index						Panel F: Controlling for the returns of MSCIWorld					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
UnexpectedFXReturns	**-0.000**	**0.001**	**0.001** **	**0.000**	**0.003* **	**0.003*** **	**-0.000**	**0.001**	**0.001** **	**0.000**	**0.004** **	**0.003*** **
	(-0.33)	(1.42)	(2.06)	(0.36)	(1.91)	(4.97)	(-0.26)	(1.26)	(2.12)	(0.30)	(2.11)	(5.02)
L.UnexpectedFXReturns	-0.000	0.001	0.001	0.001	0.021***	0.001	-0.000	0.000	0.000	0.001	0.018***	0.001
	(-0.71)	(1.49)	(1.47)	(1.61)	(11.12)	(1.12)	(-0.64)	(0.28)	(0.77)	(1.50)	(9.55)	(1.28)
L2.UnexpectedFXReturns	-0.000	-0.001***	-0.000	-0.000	0.000	0.001	-0.000	-0.002***	-0.002**	-0.000	-0.004*	0.000
	(-1.18)	(-3.10)	(-0.75)	(-0.12)	(0.11)	(1.21)	(-1.31)	(-4.71)	(-2.38)	(-0.16)	(-1.83)	(0.46)
L3.UnexpectedFXReturns	-0.000*	-0.001	-0.001**	-0.000	0.001	0.001	-0.000	-0.001*	-0.002***	-0.000	0.001	0.001
	(-1.69)	(-1.43)	(-2.09)	(-0.84)	(0.45)	(0.77)	(-1.58)	(-1.85)	(-2.64)	(-0.90)	(0.46)	(1.46)
L4.UnexpectedFXReturns	-0.000	-0.001***	0.000	0.000	-0.005***	-0.001	-0.000	-0.001***	0.000	0.000	-0.005**	-0.001
	(-0.56)	(-2.72)	(0.58)	(0.23)	(-2.91)	(-1.18)	(-0.55)	(-2.61)	(0.27)	(0.22)	(-2.57)	(-1.54)
L5.UnexpectedFXReturns	-0.000	-0.000	-0.000	-0.000	-0.001	-0.000	-0.000	-0.000	-0.001	-0.000	-0.001	-0.001
	(-1.41)	(-0.11)	(-0.63)	(-0.93)	(-0.52)	(-0.66)	(-1.34)	(-0.76)	(-1.10)	(-0.91)	(-0.26)	(-1.00)

(Cont.)

	Panel G: Controlling for the returns of MSCIEM						Panel H: Controlling for the VIX					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
UnexpectedFXReturns	**-0.000**	**0.000**	**0.001***	**0.000**	**0.003**	**0.003*****	**-0.000**	**0.001***	**0.001****	**0.000**	**0.006*****	**0.003*****
	(-0.30)	(0.94)	(1.90)	(0.30)	(1.46)	(4.82)	(-0.27)	(1.67)	(2.21)	(0.33)	(3.09)	(4.88)
L.UnexpectedFXReturns	-0.000	-0.000	-0.000	0.001	0.015***	-0.000	-0.000	0.001	0.001**	0.001	0.022***	0.001
	(-0.86)	(-0.01)	(-0.16)	(1.41)	(8.13)	(-0.33)	(-0.64)	(1.51)	(2.32)	(1.53)	(11.55)	(1.23)
L2.UnexpectedFXReturns	-0.000	-0.002***	-0.002***	-0.000	-0.004*	0.001	-0.000	-0.001**	-0.000	-0.000	0.001	0.001
	(-1.46)	(-4.54)	(-2.64)	(-0.29)	(-1.86)	(0.74)	(-1.11)	(-2.35)	(-0.07)	(-0.24)	(0.29)	(1.49)
L3.UnexpectedFXReturns	-0.000	-0.001**	-0.002***	-0.000	0.000	0.001	-0.000	-0.000	-0.001**	-0.000	0.001	0.001
	(-1.51)	(-2.04)	(-2.64)	(-0.54)	(0.06)	(1.18)	(-1.60)	(-0.90)	(-2.29)	(-0.89)	(0.46)	(1.00)
L4.UnexpectedFXReturns	-0.000	-0.002***	-0.000	0.000	-0.006***	-0.001	-0.000	-0.001	0.000	0.000	-0.005***	-0.001
	(-0.69)	(-3.29)	(-0.62)	(0.34)	(-3.05)	(-1.47)	(-0.41)	(-1.32)	(0.48)	(0.16)	(-2.77)	(-0.98)
L5.UnexpectedFXReturns	-0.000	-0.000	-0.001	-0.000	-0.001	-0.001	-0.000	-0.000	-0.001	-0.000	-0.000	-0.000
	(-1.41)	(-0.56)	(-1.26)	(-0.82)	(-0.61)	(-0.98)	(-1.37)	(-0.58)	(-0.86)	(-0.92)	(-0.16)	(-0.66)
	Panel I: Scaling flows by the trading volume						Panel J: Scaling flows by the average of absolute flows of the previous 21 trading days					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
UnexpectedFXReturns	**0.001**	**0.026*****	**0.051*****	**0.001*****	**0.014*****	**4.956*****	**0.111**	**0.549*****	**0.131*****	**4.003*****	**7.976*****	**0.001*****
	(0.82)	(7.59)	(4.96)	(4.15)	(20.13)	(4.53)	(0.82)	(7.67)	(4.96)	(4.14)	(20.14)	(5.23)
L.UnexpectedFXReturns	-0.000	-0.003	0.010	-0.000	-0.002**	2.631**	0.196	0.018	0.028	0.162	0.772*	0.001***
	(-0.27)	(-0.75)	(0.95)	(-0.43)	(-2.30)	(2.14)	(1.42)	(0.23)	(1.01)	(0.16)	(1.82)	(3.28)
L2.UnexpectedFXReturns	0.002	0.001	-0.003	-0.000	0.000	-0.336	-0.050	-0.070	-0.033	-1.338	0.272	0.000
	(1.08)	(0.14)	(-0.32)	(-0.02)	(0.28)	(-0.27)	(-0.36)	(-0.92)	(-1.19)	(-1.32)	(0.64)	(0.06)
L3.UnexpectedFXReturns	0.004**	0.004	0.024**	-0.000	-0.000	-2.926**	-0.295**	-0.146*	0.010	0.283	-0.951**	-0.000
	(2.05)	(0.98)	(2.21)	(-0.38)	(-0.39)	(-2.37)	(-2.13)	(-1.94)	(0.37)	(0.28)	(-2.24)	(-1.17)
L4.UnexpectedFXReturns	-0.002	0.004	-0.011	0.000	-0.002**	0.182	-0.093	-0.086	-0.034	-1.424	0.001	-0.000
	(-1.06)	(1.20)	(-1.03)	(1.13)	(-2.24)	(0.15)	(-0.67)	(-1.13)	(-1.24)	(-1.40)	(0.00)	(-0.38)
L5.UnexpectedFXReturns	0.001	-0.002	-0.004	0.000	-0.001	-0.349	-0.132	-0.061	0.007	-0.436	0.027	-0.000*
	(0.37)	(-0.65)	(-0.39)	(1.54)	(-1.32)	(-0.31)	(-0.96)	(-0.80)	(0.25)	(-0.43)	(0.06)	(-1.74)
	Panel K: Scaling flows by the average of absolute flows of the previous 63 trading days						Panel L: Scaling flows by the average of absolute flows of the previous 125 trading days					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
UnexpectedFXReturns	**3.534*****	**13.972*****	**16.608*****	**20.306*****	**135.139*****	**15.532*****	**2.784****	**14.238*****	**16.908*****	**21.541*****	**134.030*****	**20.767*****
	(2.78)	(8.38)	(6.04)	(3.58)	(19.58)	(4.42)	(2.13)	(8.60)	(6.18)	(3.55)	(19.65)	(5.43)
L.UnexpectedFXReturns	-0.373	-0.936	3.185	0.658	12.522*	14.070***	-0.273	-1.003	2.463	0.491	7.849	16.275***
	(-0.29)	(-0.53)	(1.11)	(0.11)	(1.69)	(3.94)	(-0.20)	(-0.58)	(0.86)	(0.08)	(1.07)	(4.26)
L2.UnexpectedFXReturns	-0.695	-1.788	-4.070	-8.898	7.102	3.934	-1.462	-1.590	-4.338	-10.914*	4.314	4.692
	(-0.54)	(-1.02)	(-1.41)	(-1.49)	(0.96)	(1.10)	(-1.10)	(-0.91)	(-1.51)	(-1.71)	(0.59)	(1.22)
L3.UnexpectedFXReturns	0.275	-2.740	1.812	2.698	-13.827*	1.213	0.148	-2.973*	2.381	0.263	-17.739**	1.408
	(0.21)	(-1.56)	(0.63)	(0.45)	(-1.87)	(0.34)	(0.11)	(-1.70)	(0.83)	(0.04)	(-2.42)	(0.37)
L4.UnexpectedFXReturns	-1.142	0.298	-1.948	-2.118	3.137	-0.944	-1.238	-0.023	-1.828	-3.168	3.013	-0.797
	(-0.88)	(0.17)	(-0.68)	(-0.35)	(0.42)	(-0.26)	(-0.93)	(-0.01)	(-0.64)	(-0.50)	(0.41)	(-0.21)
L5.UnexpectedFXReturns	-0.382	0.249	0.018	0.509	6.593	-2.063	-0.222	-0.007	0.233	-3.765	6.657	-1.145
	(-0.30)	(0.14)	(0.01)	(0.09)	(0.90)	(-0.58)	(-0.17)	(-0.00)	(0.08)	(-0.59)	(0.92)	(-0.30)

Appendix 3H. The price impact of foreign equity flows on FX returns.

This table shows the results from various robustness tests on the price impact of net foreign equity flows on FX returns, based on the FX returns equation (3.8b) for a bivariate structural vector autoregressive models (SVAR) of net foreign equity flows and FX returns with equity local returns as an exogenous variable. The VAR is structural as we include contemporaneous net foreign equity flows in the flows equation. The L. is the lag operator. We report t-statistics computed using maximum likelihood estimates of covariance matrix in parentheses, while *, ** and *** indicates statistical significance at the 10%, 5% and 1% level, respectively.

	Panel A: Without winsorization						Panel B: Using 1-day lagged flows					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
Flows	**0.320**	**3.012*** **	**1.843*** **	**1.269*** **	**2.425*** **	**1.336*** **	**-0.355**	**0.853**	**1.043** **	**0.190**	**0.527*** **	**1.376*** **
	(0.90)	(6.43)	(4.36)	(3.62)	(19.60)	(4.33)	(-0.32)	(1.60)	(2.21)	(0.31)	(3.10)	(3.61)
L.Flows	-0.067	-0.607	0.299	0.167	-0.379**	0.804**	1.241	0.649	0.130	0.495	0.270	-0.118
	(-0.19)	(-1.18)	(0.67)	(0.47)	(-2.40)	(2.28)	(1.13)	(1.17)	(0.26)	(0.80)	(1.51)	(-0.29)
L2.Flows	0.263	0.555	-0.078	0.505	0.098	-0.168	3.203***	1.152**	1.239**	0.571	0.116	-0.769*
	(0.73)	(1.08)	(-0.17)	(1.43)	(0.62)	(-0.48)	(2.92)	(2.07)	(2.51)	(0.92)	(0.65)	(-1.89)
L3.Flows	0.405	1.109**	0.882**	0.107	-0.045	-0.908**	-2.270**	1.098**	-0.199	0.818	-0.266	0.460
	(1.13)	(2.15)	(1.96)	(0.30)	(-0.28)	(-2.57)	(-2.07)	(1.97)	(-0.41)	(1.32)	(-1.50)	(1.13)
L4.Flows	-0.259	0.032	-0.351	0.306	-0.384**	0.491	0.370	0.349	0.262	1.254**	-0.070	0.154
	(-0.72)	(0.06)	(-0.78)	(0.87)	(-2.44)	(1.39)	(0.34)	(0.65)	(0.54)	(2.04)	(-0.40)	(0.40)
L5.Flows	0.187	-0.202	-0.153	0.537	-0.061	0.188	0.875	-1.561***	-0.869*	-1.400**	0.147	0.200
	(0.52)	(-0.44)	(-0.36)	(1.53)	(-0.43)	(0.61)	(0.84)	(-3.19)	(-1.90)	(-2.33)	(1.03)	(0.58)
	Panel C: Controlling for the returns of SP500						Panel D: Controlling for the returns of Nasdaq					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
Flows	**-0.348**	**0.790**	**1.064** **	**0.156**	**0.423** **	**1.413*** **	**-0.333**	**0.742**	**0.988** **	**0.184**	**0.383** **	**1.460*** **
	(-0.32)	(1.44)	(2.29)	(0.26)	(2.43)	(3.64)	(-0.30)	(1.33)	(2.12)	(0.30)	(2.18)	(3.77)
L.Flows	1.385	0.567	0.048	0.549	0.387**	-0.107	1.334	0.657	-0.022	0.571	0.364**	-0.159
	(1.26)	(0.99)	(0.10)	(0.90)	(2.13)	(-0.26)	(1.21)	(1.12)	(-0.04)	(0.93)	(1.98)	(-0.39)
L2.Flows	3.130***	1.126**	1.025**	0.524	0.155	-0.797*	3.133***	0.952	1.000**	0.537	0.174	-0.732*
	(2.85)	(1.96)	(2.11)	(0.86)	(0.85)	(-1.92)	(2.85)	(1.62)	(2.05)	(0.88)	(0.95)	(-1.76)
L3.Flows	-2.304**	1.079*	-0.167	0.861	-0.281	0.513	-2.307**	1.135*	-0.139	0.864	-0.214	0.494
	(-2.10)	(1.88)	(-0.35)	(1.41)	(-1.55)	(1.23)	(-2.10)	(1.94)	(-0.29)	(1.41)	(-1.17)	(1.19)
L4.Flows	0.380	0.378	0.165	1.275**	-0.091	0.110	0.382	0.368	0.088	1.277**	-0.104	0.088
	(0.35)	(0.71)	(0.35)	(2.11)	(-0.52)	(0.28)	(0.35)	(0.69)	(0.19)	(2.11)	(-0.59)	(0.23)
L5.Flows	0.823	-1.485***	-0.663	-1.386**	0.169	0.197	0.843	-1.478***	-0.639	-1.461**	0.156	0.191
	(0.79)	(-3.05)	(-1.48)	(-2.34)	(1.20)	(0.58)	(0.81)	(-3.04)	(-1.43)	(-2.46)	(1.10)	(0.56)
	Panel E: Controlling for the returns of Philadelphia Semiconductor index						Panel F: Controlling for the returns of MSCIWorld					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
Flows	**-0.356**	**0.721**	**0.961** **	**0.214**	**0.353** **	**1.408*** **	**-0.286**	**0.585**	**0.983** **	**0.180**	**0.374** **	**1.465*** **
	(-0.33)	(1.28)	(2.05)	(0.35)	(2.00)	(3.66)	(-0.26)	(1.06)	(2.11)	(0.29)	(2.17)	(3.76)
L.Flows	1.345	0.611	-0.048	0.590	0.370**	-0.149	1.359	0.673	-0.001	0.593	0.430**	-0.152
	(1.22)	(1.04)	(-0.10)	(0.96)	(2.01)	(-0.36)	(1.24)	(1.17)	(-0.00)	(0.97)	(2.38)	(-0.37)
L2.Flows	3.103***	0.901	1.046**	0.523	0.171	-0.720*	3.067***	0.940	1.028**	0.549	0.152	-0.816*
	(2.82)	(1.53)	(2.13)	(0.85)	(0.93)	(-1.75)	(2.79)	(1.63)	(2.11)	(0.89)	(0.84)	(-1.96)
L3.Flows	-2.327**	1.239**	-0.123	0.803	-0.266	0.556	-2.249**	1.152**	-0.116	0.855	-0.277	0.541
	(-2.12)	(2.11)	(-0.25)	(1.31)	(-1.45)	(1.35)	(-2.05)	(2.01)	(-0.24)	(1.40)	(-1.53)	(1.30)
L4.Flows	0.443	0.400	0.138	1.350**	-0.054	0.077	0.426	0.413	0.200	1.300**	-0.100	0.116
	(0.41)	(0.74)	(0.29)	(2.22)	(-0.30)	(0.20)	(0.39)	(0.77)	(0.42)	(2.14)	(-0.58)	(0.30)
L5.Flows	0.863	-1.510***	-0.637	-1.433**	0.164	0.164	0.777	-1.387***	-0.670	-1.315**	0.176	0.187
	(0.83)	(-3.08)	(-1.41)	(-2.41)	(1.16)	(0.48)	(0.75)	(-2.85)	(-1.50)	(-2.21)	(1.25)	(0.54)

(Cont.)

	Panel G: Controlling for the returns of MSCIEM						Panel H: Controlling for the VIX					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
Flows	**-0.356**	**-0.164**	**0.600**	**0.190**	**0.256**	**1.304*****	**-0.297**	**0.851**	**1.042****	**0.198**	**0.532*****	**1.377*****
	(-0.33)	(-0.30)	(1.28)	(0.31)	(1.48)	(3.36)	(-0.27)	(1.59)	(2.21)	(0.32)	(3.12)	(3.61)
L.Flows	1.407	0.957*	0.190	0.532	0.544***	-0.062	1.267	0.655	0.104	0.491	0.272	-0.121
	(1.28)	(1.71)	(0.39)	(0.86)	(3.00)	(-0.15)	(1.15)	(1.18)	(0.21)	(0.79)	(1.52)	(-0.30)
L2.Flows	2.931***	1.284**	1.271***	0.544	0.148	-0.830**	3.213***	1.115**	1.253**	0.572	0.118	-0.775*
	(2.67)	(2.28)	(2.60)	(0.88)	(0.81)	(-2.00)	(2.92)	(2.00)	(2.54)	(0.92)	(0.66)	(-1.91)
L3.Flows	-2.199**	1.218**	0.024	0.811	-0.339*	0.638	-2.255**	1.087*	-0.222	0.814	-0.263	0.455
	(-2.00)	(2.17)	(0.05)	(1.31)	(-1.87)	(1.54)	(-2.05)	(1.95)	(-0.45)	(1.31)	(-1.48)	(1.12)
L4.Flows	0.429	0.546	0.284	1.300**	-0.130	0.222	0.361	0.345	0.268	1.254**	-0.068	0.153
	(0.39)	(1.02)	(0.59)	(2.13)	(-0.73)	(0.56)	(0.33)	(0.64)	(0.55)	(2.04)	(-0.39)	(0.39)
L5.Flows	0.831	-1.562***	-0.882*	-1.328**	0.218	0.090	0.849	-1.536***	-0.892*	-1.389**	0.148	0.201
	(0.80)	(-3.20)	(-1.95)	(-2.22)	(1.52)	(0.26)	(0.82)	(-3.13)	(-1.95)	(-2.30)	(1.03)	(0.59)

	Panel I: Scaling flows by the trading volume						Panel J: Scaling flows by the average of absolute flows of the previous 21 trading days					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
Flows	**0.001**	**0.026*****	**0.051*****	**0.001*****	**0.014*****	**4.956*****	**0.001*****	**0.001*****	**0.001*****	**0.000*****	**0.001*****	**0.000*****
	(0.82)	(7.59)	(4.96)	(4.15)	(20.13)	(4.53)	(2.78)	(8.36)	(6.02)	(3.59)	(19.55)	(4.42)
L.Flows	-0.000	-0.003	0.010	-0.000	-0.002**	2.631**	-0.000	-0.000	0.000	0.000	-0.000**	0.000**
	(-0.27)	(-0.75)	(0.95)	(-0.43)	(-2.30)	(2.14)	(-1.36)	(-0.74)	(0.21)	(0.31)	(-2.55)	(2.19)
L2.Flows	0.002	0.001	-0.003	-0.000	0.000	-0.336	0.000	0.000	0.000	0.000	0.000	0.000
	(1.08)	(0.14)	(-0.32)	(-0.02)	(0.28)	(-0.27)	(0.07)	(0.25)	(0.52)	(0.30)	(0.59)	(0.46)
L3.Flows	0.004**	0.004	0.024**	-0.000	-0.000	-2.926**	0.000**	0.000	0.000	0.000	-0.000	-0.000
	(2.05)	(0.98)	(2.21)	(-0.38)	(-0.39)	(-2.37)	(2.43)	(1.16)	(1.47)	(0.01)	(-0.05)	(-0.86)
L4.Flows	-0.002	0.004	-0.011	0.000	-0.002**	0.182	-0.000	0.000	-0.000	0.000	-0.000**	-0.000
	(-1.06)	(1.20)	(-1.03)	(1.13)	(-2.24)	(0.15)	(-1.13)	(1.29)	(-0.45)	(0.78)	(-2.52)	(-0.10)
L5.Flows	0.001	-0.002	-0.004	0.000	-0.001	-0.349	0.000	-0.000	-0.000	0.000	-0.000	-0.000
	(0.37)	(-0.65)	(-0.39)	(1.54)	(-1.32)	(-0.31)	(0.78)	(-0.54)	(-0.39)	(1.20)	(-0.30)	(-0.76)

	Panel K: Scaling flows by the average of absolute flows of the previous 63 trading days						Panel L: Scaling flows by the average of absolute flows of the previous 125 trading days					
	JSX	Kospi	Kosdaq	PSE	TWSE	SET	JSX	Kospi	Kosdaq	PSE	TWSE	SET
Flows	**0.000****	**0.001*****	**0.001*****	**0.000*****	**0.001*****	**0.000*****	**0.000****	**0.001*****	**0.001*****	**0.000*****	**0.001*****	**0.000*****
	(2.13)	(8.56)	(6.18)	(3.55)	(19.60)	(5.42)	(2.12)	(8.39)	(6.22)	(3.27)	(19.74)	(6.34)
L.Flows	-0.000	-0.000	0.000	-0.000	-0.000**	0.000***	-0.000	-0.000	0.000	-0.000	-0.000**	0.000***
	(-1.20)	(-1.50)	(0.43)	(-0.44)	(-2.35)	(2.95)	(-1.02)	(-1.59)	(0.66)	(-0.80)	(-2.54)	(3.14)
L2.Flows	0.000	0.000	0.000	-0.000	0.000	0.000	0.000	0.000	0.000	-0.000	0.000	0.000
	(0.61)	(0.28)	(0.20)	(-0.20)	(0.37)	(0.55)	(0.59)	(0.20)	(0.17)	(-0.06)	(0.45)	(0.17)
L3.Flows	0.000*	0.000	0.000*	0.000	-0.000	-0.000	0.000**	0.000	0.000*	0.000	-0.000	-0.000*
	(1.82)	(1.21)	(1.80)	(0.33)	(-0.47)	(-1.29)	(2.06)	(1.50)	(1.95)	(0.56)	(-0.47)	(-1.69)
L4.Flows	-0.000	0.000	-0.000	0.000	-0.000**	-0.000	-0.000	0.000	-0.000	0.000	-0.000**	-0.000
	(-0.99)	(0.84)	(-0.75)	(0.83)	(-2.53)	(-0.06)	(-0.91)	(0.52)	(-0.70)	(1.33)	(-2.49)	(-0.55)
L5.Flows	0.000	-0.000	-0.000	0.000	-0.000	-0.000	0.000	-0.000	-0.000	0.000	-0.000	-0.000
	(0.62)	(-0.38)	(-0.27)	(1.00)	(-0.34)	(-0.65)	(0.69)	(-0.49)	(-0.32)	(1.37)	(-0.46)	(-0.80)

Concluding Remarks

Equity markets worldwide experienced a slump in the wake of the U.S. subprime crisis. A key feature of the post-1990s trend in international capital flows up until the GFC is the dramatic resurgence of international bank credit flows relative to portfolio (equity and bond) flows, which has been characterized as banking sector globalization. It is unclear whether and how the three kinds of main international capital flows have transmitted the U.S. subprime crisis to equity markets worldwide. As regards to foreign equity flows in particular, there is a recent debate in literature about the prediction Uncovered Equity Parity (UEP) condition, the correlation between equity local returns and FX returns. The thesis fills these gaps and provides a comprehensive empirical investigation of the role of international capital (equity, bond and bank credit) flows in terms of transmitting the U.S. subprime crisis abroad, as well as the role of foreign equity flows in emerging markets in terms of exchange rates determination.

The first paper is an empirical investigation whether the relative importance of hot money in bank credit and portfolio flows to EMs has changed over the 1988-2012 period. This chapter starts by deploying unobserved component (or state-space) models à-la Kalman filter to gauge the temporariness of international capital flows from the US to 9 Asian countries and 9 Latin American countries which have attracted substantial capital flows over period the 1988 to 1997.

The first paper confirms previous literature that, on average in the 1988-1997 period, equity and bond flows were largely temporary but, in contrast, bank credit is found to be more permanent than temporary. After that, re-estimating the models over the full sample period from 1988 to 2012 the results reveal an important change: bank credit has gradually become more temporary in the recent decade, while the temporariness of portfolio flows has stayed roughly the same. Third, since the change of sample periods brings about completely different results for bank credit, this paper deploys the models over the recent sub-sample, 1998 to 2012, and the results confirm that bank credit has a marked temporary component. Finally, this finding is robust to controlling for the influence of push and pull factors in the two unobserved components. The evidence supports indirectly the view that global banks have played an important role in the transmission of the global financial crisis to emerging markets, and endorses the use of regulations to manage international capital flows.

The second paper examines various plausible fundamental channels of transmission of the U.S. subprime crisis towards the equity markets of 36 countries using standard multi-equation time-series modeling techniques. Using data sampled monthly, the paper estimates vector autoregressive models to capture the joint dynamics of a set of endogenous variables that comprise equity market returns, cross-border capital (equity, bond and bank credit) flows and international trade in both gross and net terms, while controlling for investor-fear risk, commodity market risk and U.S. long-term interest rates as exogenous or push factors. The paper tests for the presence of causality from cross-border portfolio (equity and bond) flows, bank credit flows, and international trade towards worldwide equity market returns.

The results show that cross-border bank credit did play a predominant role in the transmission of the US subprime crisis to worldwide equity markets. This finding is pervasive across country groups but the magnitude of the transmission effect from bank credit to equity market returns is stronger for EM countries. More clear-cut evidence is obtained when capital flows and trade are measured in net rather than gross terms. A battery of robustness checks redefining the exogenous vector of variables to comprise the Fed interest rate and/or the TED spread, measuring the equity indices in local currencies instead of US dollars, weighing the countries in each group according to equity market capitalization, and moving the start date of the U.S. subprime crisis period to July 2007 yield results that do not challenge the main findings. These findings endorse the efforts made by policymakers and international organizations to implement better surveillance of a market's external exposure to other markets, as well as improved prudential banking regulations together with capital controls.

The third paper examines the mechanisms underlying Uncovered Equity Parity (UEP) as well as its prediction, using daily foreign equity flows, equity local returns and FX returns data for six Asian markets from the 1990s to 2013. The main methodology in this paper is vector autoregressive models, including both reduced-form vector autoregressive models and structural vector autoregressive models.

The third paper confirms previous literature there is a positive rather than negative relationship between equity and currency returns in EMs, which is termed as the failure of UEP in emerging markets. The paper further finds that it is because the foreigners in aggregate chase returns rather than rebalance their portfolios in emerging markets, while foreign equity flows do cause exchange rate movements in the same direction. Thus, the third paper unveils another side of UEP. Additionally, the third paper finds little evidence that foreign equity flows respond to past currency returns, suggesting that foreign equity investors only use local currency as a vehicle in emerging markets. Finally, the third paper finds a strong contemporaneous positive relationship between foreign equity flows and FX returns, and a weak inter-temporal relationship which implies that foreign equity flows may also have a positive and permanent impact on future FX returns.

This thesis fills a gap in the international literature with respect to the empirical investigation of the crisis-transmission role of cross-border equity flows, bond flows, bank credit and international trade. The analysis also provides a contribution to the recent banking literature arguing that a side effect of the banking globalization phenomena is that cross-border bank credit flows have become, both on account of their size and reversibility, relatively more worrisome to risk managers. It improves the understanding of crisis transmission in the field of macro-finance, especially the transmission of 2007 U.S. subprime crisis to equity markets worldwide. Furthermore, this study provides a contribution to the relatively recent parity condition, the uncovered equity parity.

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