THREE ESSAYS ON INTERNATIONAL MUTUAL FUND FLOWS

by

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To my father (Nguyen Khac Bang) and my mother (Cao Kim Anh),
who always motivated and supported me with my academic career.
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ABSTRACT

THREE ESSAYS ON INTERNATIONAL MUTUAL FUND FLOWS

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In this dissertation, I investigate the comprehensive relationship of international mutual fund flows among markets. While my first essay presents the unprecedent findings of commonality in mutual fund flows and global market integration, my second essay focuses on answering the classic question in financial market: is there any contagion in the market for asset management? In the third essay, I examine the intransitivity puzzle presented in the first essay.

In the first essay, I examine global integration in the market for asset management, as indicated by the correlation of mutual fund flows across domiciles. I observe no leading role for the US relative to flows in other domiciles. I do observe a strong global factor in MF flows, and global integration is linked to a market's business environment, safety from conflict, and political stability. In regional analysis, Europe represents an integrated market for asset management, led by Luxembourg, where asset managers face common flow risks across domiciles. The Asia-Pacific region displays no coherent patterns of correlations across domiciles.

In the second essay, I examine the evolution of contagion over time and across conditions in the market for asset management. First, I examine the time trend in cross-domicile mutual fund

flow correlations during recent decades. Second, I model contagion in fund flows during different conditions of market stress. Last, I investigate changes in cross-domicile flow correlations during and after the financial crisis of 2006-2008. Results indicate that there was a peak in market contagion during the financial crisis period, and correlations decreased in the following periods.

In the third essay, I examine how international mutual fund (MF) flows are largely uncorrelated with the United States' (US) MF flows, although non-US MF flows are associated with non-US MF returns, non-US MF returns are strongly associated with US MF returns, and US MF returns are associated with US MF flows. I refer to this puzzle as the intransitivity of international MF flows. To explain the intransitivity of international MF flows, I decompose domicile-level MF returns into a component that is associated with US returns and an idiosyncratic domicile-level return component. I then decompose US MF flows into an expected component based on US MF returns and an unexpected component. I explain the intransitivity puzzle by showing that domicile fixed-effects, macro-economic control variables, and the aggregation of fund-level data to domicile-level flows reconcile the apparent inconsistencies in the international MF flow and performance associations.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF APPENDICES

CHAPTER 1

Commonality in mutual fund flows and global market integration[1]

Abstract

We examine global integration in the market for asset management, as indicated by the correlation of mutual fund flows across domiciles. We observe no leading role for the US relative to flows in other domiciles. We do observe a strong global factor in MF flows, and global integration is linked to a market's business environment, safety from conflict, and political stability. In regional analysis, Europe represents an integrated market for asset management, led by Luxembourg, where asset managers face common flow risks across domiciles. The Asia-Pacific region displays no coherent patterns of correlations across domiciles.

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1. Introduction

Mutual funds (MFs) have grown dramatically in recent decades and now play a central role in the functioning of financial markets worldwide. As of the end of 2018, worldwide assets invested in regulated open-end funds were $46.7 trillion, almost double the $26 trillion of assets managed at the end of 2007, and almost eight times the $6 trillion at the end of 1996 (Investment Company Institute, 2019). The number of MFs has also increased to 118,978 funds available for sale, up 4.7% from 2017 and a 43.4% increase since 2009. For some time now, a growing majority of MF assets under management (AUM) are located outside of the United States (US) (Ferreira, et al., 2013).

Flows of money into MFs represents a major source of portfolio demand in national financial markets. Despite the growing role of MFs outside the US, academic research on MF flows has long been dominated by studies of US-domiciled MFs. There exists little evidence on how the MF flows of individual countries correlate with each other, or how the flows of individual countries are associated with worldwide flows. Does commonality in liquidity exist in the market for asset management? Does the US play any special role as a leader in global liquidity trends in asset management, as the US does in equity market returns? Do markets' flows follow regional leaders? Is global integration a good thing for a market, representing the ability to successfully compete against other markets as an asset management venue? Alternatively, is integration better characterized as a dangerous susceptibility to fickle and unreliable trends in global liquidity? What types of socio-political conditions determine this integration or segmentation? We aim to address these questions by characterizing commonality in MF flows across market and the factors that are associated with a market's integration with global liquidity trends in the market for asset management.

On the surface, our work appears to have much in common with the extensive literature on cross-border capital flows (e.g., Broner, Gelos, and Reinhart, 2006; Raddatz and Schmukler, 2012; Jotikasthira, et al., 2012; Koepke, et al., 2020). However, our focus is different: we examine MF flows based on the domicile[2] of where MF flows arise and not the destination of the flows. This makes our study one of the few to analyze cross-country MF flows patterns based on the origin, rather than the destination, of flows.

There are multiple reasons why it is essential to understand the global structure of MF flow patterns. Calderon and Kubota (2013) and Frankel and Schmukler (1996) demonstrate that local investors (i.e., investors in a MF's domicile) are more important in many contexts than external investors. Our analysis follows from their insight, in that our focus on domicile level data aligns with the source of fund flows, while the predominant focus of published work on international capital flows looks at the destination of capital flows. Our focus on the sources of MF flows makes our work closely related to other cross-country comparisons of MFs, such as the studies by Khorana, et al., (2005, 2009) and Ferreira, et al., (2012, 2013, 2018). While existing cross-country MF comparisons examine fund operational and performance metrics, they do not compare flow dynamics across domiciles. Ferreira, et al., (2013) comes close, by looking at variation in the flow-performance relationship around the world, but their goal is primarily to illustrate cross-country differences in diseconomies of scale in asset management, rather than commonality in liquidity across markets.

2 MF flow data are tagged with the legal domicile of each MF. These domiciles do not necessarily align with "countries" as reported in other databases or the published literature. When we use domicile-level MF flow data we will refer to "domiciles". When we refer to variables classified at the country level, we will refer to "countries". When we refer to variables or concepts that could apply at either level or are unclear, we will refer to "markets". For example, Jersey, Guernsey, Gibraltar, and the Isle of Man report fund flows as separate domiciles from the UK but may be aggregated with the UK in market or country level data.

Second, there exists growing evidence that flow management is a vital component of successful asset management (Yan, 2006; Rohleder, Schulte, Wilkens, 2017). As a result, global asset management companies need to know if they can diversify flow risk across investor domiciles, or if domiciles tend to have similar flow patterns. There currently exists little formal evidence about international diversification in the context of flow management and interrelationships between MF flows across countries. Our measurements of MF flow correlations provide valuable insights on this issue.

Third, understanding market integration, segmentation, and the mechanisms by which liquidity is transmitted across borders, is necessary to judge how cross-country regulations and capital controls should be structured in the asset management industry. For example, Gomes (2018) examines structural reform in the euro area and shows that liquidity impacts vary across different types of investments, implying that there may exist meaningful cross-country patterns in MF flows. Montiel and Reinhart (1999), among others, demonstrate that "pull" patterns in destination countries are of primary importance in determining overall capital flows. Therefore, we need to know if existing knowledge about return correlations and overall capital flows translates to MF flow patterns across domiciles.

Our research has several sets of results. First, we provide detailed analyses about the correlations of mutual fund flows across domiciles and how these flow correlations differ substantially from return correlations. Unlike return correlations across markets, fund flows are largely uncorrelated from domicile to domicile, and the US displays no substantial association with other domiciles' MF flows. Third, the extent to which individual markets' asset management industries are integrated or segmented from global liquidity trends is associated with each market's level of economic development, business integrity, political stability, and GDP growth, but is unrelated to safety from conflict, inflation, and exchange rate stability.

To the best of our knowledge, we are the first to study international MF flow correlations using a worldwide sample of funds and markets. Our sample, drawn from Morningstar, the Center for Research in Security Prices (CRSP), and Emerging Portfolio Fund Research (EPFR), covers open-end actively managed equity funds at a monthly frequency in 63 countries over the period from 1996 to 2019. In the context of our study, domicile-level MF flows are best seen as a measure of domestic liquidity in each market. Our cross-market comparisons align with other analyses of commonality in liquidity (e.g., Karolyi, Lee, Van Dijk, 2012). The use of domicile-level MF flow data is novel in this context, as MFs represent one of the most important intermediaries lying between formal financial institutions, such as banks, and the financial markets.

Our results contribute to several strands of the literature. Most broadly, we contribute to the literature on variation in financial cycles across markets. We show that a market's "beta", or univariate regression coefficient on US fund flows, is close to zero on average and statistically significant no more often than would be expected by chance. Therefore, the US plays no substantial role in leading or explaining other markets' MF flows. However, forty out of sixty-three countries (63.5%) display significant associations with worldwide flows. We find that Czechia is the only market to have flows negatively associated with a global factor in fund flows.

Our results are consistent with existing findings for Chinese MF flows (Zhou, 2018), as well as capital flows or liquidity for Central and Eastern European countries (Lane and Milesi-Ferretti, 2007; Olbrys, 2020), and six Pacific-Basin equity markets (Ng, 2000). However, Rigobon (2019) raises concerns about endogeneity and omitted variables in the empirical methodologies of cross-country comparisons, such as these. Our paper addresses these concerns by providing multiple robustness techniques that provide consistent results.

We contribute to the literature on how a market's financial and institutional development is associated with investment cycles by showing that a market's exposure to worldwide liquidity is associated with several market-level characteristics. Our analysis of the importance of financial market development extends the findings of Bekaert, et al., (2007a and 2011) for market segmentation and the findings of Bekaert, et al., (2007b) and Hearn (2014) for commonality in liquidity. We find no evidence for an association between government stability, socio-economic development, internal conflict, ethnic conflict, law and order, democratic accountability, or exchange rate stability, with exposure to global liquidity. This suggests that integration in the market for asset management is distinct from the cross-country drivers of liquidity, as Bekaert, et al., (2007b) and Hearn (2014) found these factors to be important in explaining liquidity differences across markets. Instead, we observe significant associations between investment profiles, external conflict, corruption, military involvement in politics, democratic accountability, and bureaucracy quality with exposure to global liquidity. This is consistent with the findings of Bekaert, et al., (2011) and Bekaert, et al., (2007a). This supports the argument by Koepke, et al., (2020) that fund-based flow measures are more susceptible to "push" factors, possibly by construction.

Last, we contribute to the literature on commonality in liquidity and choice of trading venue. Commonality in liquidity in equity and debt markets is studied by Fabre and Frino (2004) for Australia; Brockman and Chung (2002) for Hong Kong; Pukthuanthong and Visaltanachoti (2009) for Thailand; Wang (2013) for twelve stock markets in Asia; Bai and Qin, (2015) for 18 emerging markets; and Karolyi, et al., (2012) and Brockman, et al., (2009) for global samples of countries. Amihud, et al., (2015) show that there exists commonality in liquidity across countries, as well as a distinct commonality in exposure to liquidity. Our analysis extends these studies by documenting the extent to which investors in different domiciles display correlated patterns in saving, investment, and demand, as represented by MF flows.

2. Background and motivation

2.1. International capital flows

There exists a rich literature on aggregate capital flows across countries, but often without a specific focus on MFs. For example, Froot, et al., (2001) explore daily international portfolio flow correlations for 44 countries, with additional analysis of weekly flows for 25 countries provided by Froot and Ramadorai (2008). Both papers find that inflows have positive forecasting power for future equity returns, especially in emerging markets. Bohn and Tesar (1996) find evidence that US-based flows to international markets are positively correlated with lagged flows. Country level influences on international portfolio flows are modeled by Brennan and Cao (1997) and analyzed empirically by Sarno, Tsiakas, and Ullao (2016), Byrne and Fiess (2016), and Cerutti, Claessens, and Puy (2019). However, these studies generally focus on the cross-border aspects of flows to-and-from each market, rather than on correlation patterns in the flows that arise from each domicile.

Koepke (2019) and Koepke, et al., (2020) provide summaries of research on capital flows to emerging markets, but do not focus on flow correlations across domiciles. These summaries present a useful taxonomy of the different types of capital flows (e.g., portfolio debt flows, portfolio equity flows, and banking flows, as well as the distinction between capital flows and fund flows) with a major focus on the drivers of capital flows over time. "Push" factors, such as global risk aversion (Fratzscher, 2012; Koepke, 2018; Bruno and Shin, 2015) and external interest rates

(Fernández-Arias, 1996; Montiel and Reinhart, 1999; Baek, 2006; Fratzscher, et al., 2018), matter most for portfolio debt and equity flows but are less important for banking flows. On the other hand, "pull" factors like output growth (Chuhan, et al., 1998; Baek, 2006; De Vita and Kyaw, 2008; Forbes and Warnock, 2012; Ahmed and Zlate, 2014), asset returns (Chuhan, et al., 1998; Froot, et al., 2001; Fratzscher, 2012) and country risk (Baek, 2006) seem important for all three capital flow components. In general, there exists limited evidence that overall portfolio flows are positively correlated across countries, and there is less work on how flows to and from leading markets, such as the US, are associated with flows from the rest of the world. Furthermore, none of the works cited above on aggregate capital flows make a detailed attempt to isolate the role of MF flows within their analysis.

Koepke (2019) refers to limited works from the MF literature, but mainly with a focus on investor behavior, such as how MFs tend to exacerbate the pro-cyclicality of capital flows to emerging markets (Raddatz and Schmukler, 2012) or emerging market flows via exchange-traded funds (ETFs) (Converse, et al., 2020). Koepke, et al., (2020) provides a more detailed discussion of the distinction between total capital flows that are the primary focus in the pertinent Economics literature, and mutual fund flows, that are more prominent in the Finance literature. Although Koepke, et al., provide an analysis of the different datasets used to analyze cross-country fund flows, including the EPFR data that we rely on, their focus remains on country-to-country flows to emerging markets, rather than on flows arising from worldwide domiciles, that are our focus. Gelos (2011) provides a related survey on the behavior of international mutual funds and the implications for capital flows. Gelos (2011) and Borensztein and Gelos (2003) conclude that fund flows across countries generally do not move together. This is an interesting finding, given that our results fall in the same direction.

2.2. Cross-country comparisons of mutual funds

When studies have explicitly considered MF characteristics across countries, the focus has generally not been on flow correlations. Instead, existing studies have compared institutional investors' or mutual funds' governance (Aggarwal, et al., 2011; Ferreira and Matos, 2008), expenses (Khorana, Servaes and Tufano, 2009), size (Khorana, Servaes and Tufano, 2005), active management (Cremers, et al., 2016), and the MF flow-performance relationship (Ferreria, et al., 2012). While these studies may briefly consider flows, they provide no detailed analysis of flow correlations across countries.

When researchers have examined flow correlations across countries, the focus has largely been on the time-series interactions between flows and returns within regions or pairs of domiciles. For example, Fong, Sze, and Ho (2018) conduct a vector-autoregression (VAR) analysis of MF flow dynamics between Hong Kong and several global markets. Likewise, Lee, Paek, Ha, and Ko (2015) perform some analysis that overlaps with ours through a VAR model, but only for ten markets. Brown, et al., (2003) examine the cross-correlations in daily MF flows between the US and Japan, but with a focus on short-term investor sentiment rather than fund flow dynamics.

The cross-country structure of MF flows from advanced economies to developing markets is the subject of work by Puy (2016), Raddatz and Schmukler (2012), and Jotikasthira, et al., (2012). These three studies are similar to ours in that they examine MF flow patterns, but they differ from our work in that their focus is on US-domiciled MF flows to emerging markets rather than flow correlations between many different markets. Overall, our work has the most similarities to that of Puy (2016), in that we both examine MF flows, with both of us drawing on the EPFR dataset. However, our work differs from that of Puy in that we focus on a comprehensive worldwide analysis of domicile-level correlations while Puy restricts his analysis to contagion from developed to emerging markets.

2.3. Cross-country comparisons of stock returns and liquidity

Because the MF literature offers little guidance on what to expect for global cross-country flow correlations, we turn instead to the literature on cross-country stock return patterns to motivate our prior expectations. An extensive literature documents that significant positive correlations exist between the world's financial markets (Eun and Shim, 1989; Hamao, Yasushi, and Ng, 1990; Karolyi and Stulz, 1996; Forbes and Rigobon, 2002). The role of the US as a leading market is documented by numerous studies, such as Rapach, et al., (2013). Rapach, et al., find that lagged US returns significantly predict returns in numerous non-US industrialized countries, while lagged non-US returns display limited predictive ability with respect to US returns. Likewise, Lee & Rui (2002) find that US returns have predictive power for UK and Japanese returns.

Volatility spillovers in returns from the US to the rest of the world are studied by Eun and Shim (1989) for 8 countries; Becker, et al., (1992) for Japan; Hamao, et al., (1990) for the UK and Japan; Kim and Rogers (1995) for Korea; Copeland and Copeland (1998) for Europe and the Pacific; Ng (2000) for six Pacific-Basin countries; and Martens and Poon (2001) for the UK and France. Conventional wisdom states that emerging markets are less efficient than developed markets and position the US as the most advanced developed country in terms of financial market development. It is intuitive that other countries follow the past US return. The US is the world's largest equity market and has the largest open capital markets, which causes non-US investors to pay attention to US returns as a leading indicator of local returns. As a result, information on macroeconomic fundamentals diffuses gradually from the US market to other countries' markets.

Another strand of the literature examines factors that lead to commonality in liquidity across national stock markets. Wang (2013) concludes that market-level volatility spillovers are central to commonality in liquidity across Asian markets. Bai and Qin (2015) confirm that commonality in liquidity is positively related to co-movements in volatility, and negatively related to the level of development of financial markets for 18 emerging markets. Brockman et al. (2009) also find evidence to support strong commonality in liquidity for Asian stock exchanges, but not for Latin America exchanges. Karolyi, et al., (2012) examine how commonality in liquidity varies across countries and over time and find that commonality in liquidity is greater in countries during times of high return volatility, a greater presence of international investors, and more correlated trading activity.

2.4. Reaching for yield, flights to quality, and choice of trading venue

Our focus on domicile-level fund flows is related both to the choice of security by investors, as well as to the geographic decision of where to direct funds. To the extent that international institutional investors select MFs in one domicile over another based on domicile-level legal and financial characteristics, our paper has implications for the literature on the choice of trading venue by investors. However, differences in risk levels and the types of securities listed in each venue imply that the choice of trading venue also involves choices related to risk, expected return, and other security characteristics. Furthermore, within each domicile, flows into and out of MFs in general, as well as flows from one fund investment objective to another, reflect changing preferences for investment style and risk-return profiles of securities.

The choice of trading venue by investors is well covered in the literature on price discovery and market share for cross-listed stocks (i.e., Sabherwal, 2007; Eun and Sabherwal, 2003). Both Pagano, et al., (2002) and Dodd (2013) demonstrate that liquidity and regulatory concerns are important determinants in the choice of cross-listing venue. Karolyi (2006) argues that listings on US markets are associated with significant improvements in their information environment, and cross-listing is one credible way for firms to commit to extensive and continuous disclosure.

Different trading venues imply different risk-return profiles of the securities on offer. Flows to domiciles with increased expected risk and returns can be described as "reaching for yield". "Reaching for yield" refers to the investors' tendency to buy riskier assets to maintain yield levels during periods of low risk aversion and/or low risk premiums. Remolona and Schrijvers (2003) show that foreign exchange reserve managers have incentives to seek out securities from domiciles with favorable yields in low-rate environments, while Rakowski and Shirley (2020) demonstrate that reaching for yield can be an important motivation for MF managers to hold potentially risky securities, such as exchange traded notes. In bond markets, a similar trend occurs for corporate bond mutual funds (Choi and Kronlund, 2018; Czech and Roberts-Sklar, 2019), and pension funds (Andonov et al., 2017).

Episodes of reaching for yield are often interspersed with sudden and dramatic shifts to "flights to quality" (Baur and Lucey, 2009; Briere, et al., 2012; Baele, et al., 2020). A flight-to-quality pattern in investment can be viewed as the opposite of reaching for yield. Flights to quality reflect the extreme and inverse movements in bond and equity markets in periods of market stress (Baele et al., 2020). Abundant evidence for flights to safety have been found in the US (Baele et al., 2020), and European markets (Ehrmann and Fratzscher, 2017; Beber et al., 2009). Overall, our work has numerous overlaps with the existing literature on how fund flows depend on location-specific characteristics that should be effectively captured in our domicile level measures of fund flows.

2.5.Hypotheses

2.5.1 The correlations of domicile level MF flows with US and global MF flows

The existing literature on cross-country return correlations provides us with two benchmark null hypotheses with which to evaluate patterns in cross-domicile MF flow correlations[3]. We know that stock return correlations are led by the US and that there also exists a common global component in stock returns. Therefore, we test the extent to which domicile-level MF flows are associated with both world flows and with US flows:

$H1a_0$: Domicile flows are unrelated to world flows.

$H1a_A$: Domicile flows are positively associated with world flows.

$H1b_0$: Domicile flows are unrelated to US flows.

$H1b_A$: Domicile flows are positively associated with US flows.

Hypothesis 1 allows us to confirm if MF flow correlations follow the same patterns as stock return correlations. As the literature includes evidence for both contemporaneous and lagged correlations between global financial markets, we do not specify the time series structure of the association in our first hypotheses and we examine both contemporaneous and lagged relationships in our empirical tests.

A high correlation between domicile-level MF flows and world flows indicates a national market for asset management that is strongly integrated with (or exposed to) global liquidity. Well-integrated markets may reflect healthy trade and financial links to the worldwide economy, but

3 In the literature cited above we have distinguished between papers with an explicit MF focus and papers with a more general focus on equity market returns or overall capital flows. In our hypotheses and analyses that follow, we refer exclusively to MF flows and MF returns in all references to flows and returns, unless otherwise stated.

such links also expose a country to global cycles beyond the control of local governments and regulators. Identifying the factors that explain cross-domicile variation in these exposure to global liquidity is the next goal of our inquiry. Our next hypothesis concerns the distinction between healthy or pernicious aspects of market integration.

2.5.2 The quality of socio-political institutions and exposure to global liquidity

An investment domicile is fundamentally a legal and institutional setting that defines the contractual structures between an MF, its investors, and its regulators. If this view is accurate in characterizing the distinction between MF domiciles, then the legal and political characteristics of a domicile should be of primary importance in determining the characteristics the MF flow characteristics and the nature of exposure to global trends in liquidity. While our data and setting are inappropriate for tests of causation between domicile characteristics and exposures to global liquidity, we can still make useful inferences about the nature of MF flow patterns by examining the associations of flows with levels of socio-political development. If our null is that exposures to global liquidity are unrelated to socio-political development, then the question of interest is if market integration is more associated with positive or negative socio-political indicators. Taking the perspective that market integration is benign (Schumpeter, 1911; Levine, 1997), we express our alternative hypothesis as such:

$H2_0$: Exposures to global liquidity are unrelated to socio-political indicators.

$H2_A$: Greater market integration is associated with positive socio-political indicators.

Associations between market integration and socio-political indicators may be either positive or negative. A more exploratory question without an explicit hypothesis, is: which socio-political indicators are important in explaining variation in exposures to liquidity? The existing literature suggests that socio-political measures capturing the rule of law, trust, political stability, and contracting rights should be related to levels of market segmentation and integration.

Weak legal institutions and political instability are known to increase risk for foreign investors and lead to market segmentation (La Porta, 1997; Bekaert, 1995). Bekaert et al., (2011) shows that political risk profiles and stock market development are important in explaining the segmentation of equity markets. However, it is unclear if the cross-border preferences of foreign investors in the studies by La Porta (1997), Bekaert (1995), and Bekaert, et al., (2011) translate to the market for asset management. Calderon and Kubota (2018) show that financial openness has mixed effects on exposures.

Poor legal and political institutions may leave some domiciles dependent on excess global liquidity trends, as investors move into marginal domiciles in a search for yield. Alternatively, local investors forego capital flights and invest at home in a search for yield when global opportunities are saturated. Both trends would give the appearance of greater integration for these domiciles, but as a reflection of institutional weakness rather than quality. Bekaert, et al., (2014) shows that measures of political risk, current account deficits, unemployment, and budget deficits where associated with increased exposure to financial crises. Good governance, as captured by effective deposit insurance programs, reduced exposures to the crisis. These findings provide a starting point for our analysis, from which we expand in several directions. We include several of these economic measures in our analysis to examine how the findings of Bekaert, et al., apply to the market for asset management.

2.5.3 Economic development and exposure to global liquidity

It is well established that a country's social development is tied to the level of economic development (Sen and Foster, 1997). Consistent with this view, numerous studies document links between a country's financial integration and socio-political measures (for example, Bekaert, et al., 2011, 2014). Karolyi, Lee, and van Dijk (2012) and Bai and Qin (2015) find that commonality in liquidity is higher for emerging markets. Furthermore, the transmission of liquidity shocks from one country to another appears to function differently for emerging and developed economies (Calvo, et al., 1996; Brockman, Chung, and Perignon, 2009; Rigobon, 2019).

Together, the existing evidence suggests that market integration may be a vulnerability for emerging markets, but not for developed economies. We consider this possibility by examining if a country's economic development determines how socio-political indicators are associated with market integration. If emerging markets are more vulnerable to the negative aspects of global liquidity spillovers, then we may expect stronger measures of integration in the presence of negative socio-political indicators for emerging markets. If institutional quality allows for an effective insulation of a financial system from global liquidity imbalances, then developed markets may display little or no association between socio-political indicators and global liquidity.

$H3_0$: Market integration is unrelated to the level of economic development.

$H3_A$: Emerging markets are more integrated in the presence of lower socio-political indicators; developed markets do not display an association between socio-political indicators and market integration.

3. Data and sample construction

3.1. MF flow and return measures.

Our primary source for fund flow data is EPFR, from which we obtain total net assets (TNA), net asset value (NAV), flows, and asset appreciation due to exchange rate changes at the fund share class level. Non-missing valid fund level EPFR data cover 1,169,448 fund-month observations from 21,023 funds over 24 years from 63 domiciles. Our second dataset on fund flows and returns is manually collected from Morningstar for open-end funds from 1996 to 2019, with an initial sample of around 370,000 global funds domiciled in 82 countries, not including the US. Morningstar provides monthly or quarterly data on fund-level TNA and NAV in both US dollars and local currency, and other fund characteristics. After screening for positive TNA and NAV, we retain 177,418 valid fund-month observations from 3,229 funds from 24 domiciles. Data for US funds are from the CRSP Survivor-Bias-Free US Mutual Fund Database, with standard filters to keep positive TNA, non-missing returns, and fund identifier variables.

We merge our fund level data from EPFR, Morningstar, and CRSP by any available fund identifiers, and then manually eliminate duplicate observations of the same fund. Merging at the fund level allows us to retain the greatest possible coverage of funds in each market. Appendix A lists the domiciles covered by each dataset. Fund returns are computed as the local currency monthly percentage change in fund NAV, after adjusting for any distributions. When there are multi-share classes of a fund, we sum the TNA across classes, and average returns across classes, weighted by lagged TNA. We calculate the monthly flow for each fund, $Flow_t$, as is common in the literature on MF flows (i.e., Sirri and Tufano, 1998):

$$Flow_t = TNA_t - TNA_{t-1} * (1 + r_t). \qquad (1)$$

When fund flows are reported quarterly, we distribute these quarterly flows evenly over the three months of the quarter. TNA, flows, and returns are measured in local currency.

We use overlaps between Morningstar and EPFR to identify and correct discrepancies in the data and to confirm the reliability of our fund TNA and return calculations. If there is a discrepancy between Morningstar and EPFR, we prioritize the EPFR values for two reasons. First, EPFR reports monthly data (rather than quarterly, which is the most frequent available measure for several countries in Morningstar). Second, EPFR allows for a more direct decomposition of flows into local currency changes in fund TNAs and US dollar changes in TNA due to exchange rate changes. We manually check outlier observations of returns, flows, and foreign exchange adjustments using Morningstar, Datastream, Bloomberg, and/or fund websites and we either correct misreported values or discard observations that are identified as errors.

To compute domicile-level aggregate monthly flow, *Domicile* $flow_{i,t}$, we average flows across funds in each domicile, weighted by lagged TNA, for each domicile-month. Domicile-level returns are computed similarly. We require a domicile to have at least 2 funds and 6 consecutive months of data to be included in the sample. Our domicile level aggregation methods are designed to capture flows that arise from the births and deaths of funds but not changes in data coverage. We explore several alternative aggregation methods where we change the order of weighting or averaging and computing flow, such as first summing domicile-month TNA and then computing domicile flows, as well as constructing flows from winsorized TNA and/or returns. We manually examine outliers and extreme values with flows computed from alternate methods and conclude that alternative domicile-level flow calculations are driven more by data errors or changes in coverage, rather than true fund flows. We drop six domiciles (Vietnam, Tanzania, Slovakia, Lithuania, Cyprus, and Bangladesh) from our sample because they lack sufficient flow observations that overlap with flows for the US, as used in some of our tests. The merged and cleaned sample consists of 9,011 domicile-month observations of flows, returns, and TNAs for 63 domiciles from January 1996 to December 2019.

Our descriptive statistics, presented in Table 1, provide a variety of new stylized facts that are important for understanding the nature of cross-domicile MF flow associations. Panel A of Table 1 shows the descriptive statistics of world-level data for our four main variables of interest:

world flows, US flows, domicile returns, and US returns. For each domicile *i*, world flows and world returns are constructed as the lagged-TNA-weighted average monthly flows and returns, respectively, across all domiciles with valid domicile flows and returns each month, not including the US or domicile *i*. Reported statistics in Panel A are averaged over all domiciles and sample months. On average, the US has flow of 0.314% and world flow is 0.180%, while the average US return is 0.500% and average world return is -0.209%.

Panel B of Table 1 contains descriptive statistics of the aggregate domicile flows and returns from the 63 domiciles in our sample. Among all domiciles, the US stands out with longest time coverage and highest average total TNA coverage of about $12 trillion (consistent with Khorana, Servaes and Tufano, 2005). Nigeria has the lowest average TNA coverage ($14.16 million). Following the US, we observe Luxembourg, the UK, Ireland, Japan, and Canada as the largest domiciles, by TNA coverage.

Our sample statistics are comparable to those of similar datasets in the published literature, such as Ferreira, et al., (2012, 2013), although our sample includes roughly twice the number of domiciles as Ferreira, et al., (2012, 2013) and our sample period is over twice as long as theirs. For example, our reported average flows and returns are very similar to those reported by Ferreira, et al., (2013, Table III, p. 492). Our manual examination of outlier observations would appear to, therefore, have a similar impact on the overall distribution of returns and flows as Ferreira, et al.,'s winsorization procedure. In Appendix B, we compare our sample coverage of each domicile's total TNA with ICI data for year 2018. The comparison to ICI confirms that our sample is representative, but short of complete, for most world markets.

Average monthly returns reported in Table 1, Panel B, are equal-weighted over time and value-weighted across funds in each domicile. Seven of sixty-three domiciles have negative average monthly returns, with Bahrain representing the lowest average monthly return (-1.55%). On the other extreme, Turkey has highest average monthly return (1.95%) during sample period. The US is in the top sixteen domiciles with an average monthly return of 0.50%. Summary statistics for average flows are interesting: more than half of the domiciles have negative average flows (38 of 63 domiciles). The highest average flows in our sample are observed in Poland, Indonesia, the Philippines, Korea, and Russia.

Panel C of Table 1 reports pairwise Pearson correlations of monthly flows across domiciles over the full sample period. We see that out of 1,954 pairs of flow correlations (for 63 domiciles), approximately two-thirds (68.32%) have positive correlations, one-third (30.40%) display negative correlations, and 25 pairs lack sufficient overlapping data for reliable correlation measurements. Approximately 12.60% of pairs have a correlation that is significant at the 1% level. The highest positive pair of flow correlations is between Austria and Romania (0.8406; *p*-value <.0001), followed by Romania and Germany (0.8372; *p*-value <.0001), and Romania and Luxembourg (0.7985; *p*-value <.0001). The strongest negative pair of flow correlations is between Bahrain and Andorra (-0.7586; *p*-value 0.1371), followed by Pakistan and Gibraltar (-0.6354; *p*-value 0.0020), and Poland and Greece (-0.5792; *p*-value 0.0793). Billio, et al., (2017) find that standard correlation measures work as well as, or better than, more sophisticated procedures to measure cross-market integration (of equity returns). However, we evaluate simple correlations with caution, as Forbes and Rigobon (2002), Bekaert, Hodrick, and Zhang (2009), Pukthuanthong and Roll (2009), and Volosovych (2011) all criticize the exclusive reliance on correlation measures to infer market integration, segmentation, or contagion.

3.2. Socio-political measures

Our focus on legal domiciles as venues for investment suggests that the legal structure, development, and culture of a domicile should be central to that domicile's integration or segmentation from global liquidity. Our measures of these characteristics include metrics capturing the political, economic, and social stability and structure of each domicile. Links between these variables and exposure to global liquidity can help inform whether such exposures appear more consistent with healthy financial links or with susceptibility to global liquidity imbalances. Separately, we consider grouping variables that may be useful to identify which domiciles display similar patterns of market integration. Grouping measures include regional identifiers and a broad indicator of the emerging market level of financial development.

Our underlying source of socio-political indicators is the International Country Risk Guide (ICRG) rating. ICRG provides quantitative economic, financial, political, and composite risk ratings for 93 countries[4] on a monthly basis since January 1984. We standardize all ICRG measures to have a mean of zero and standard deviation of 1. High values by ICRG indicate more favorable, or less risky, conditions. Baek and Qian (2011) refer to the ICRG measures as the most comprehensive indices of political risk and note that the ICRG measures have the advantage of being directly relevant for foreign investors.

Following Mina (2017), we cluster ICRG measures into three principal component factors using principal component analysis (PCA). Appendix D provides summary statistics from our PCA

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4 Appendix C lists the substitute data sources for those domiciles missing country level data. One domicile (Mauritius) does not report country level measures and so we substitute country level measures from the most similar country based on a propensity score matching algorithm using socio-political data from the Economist Intelligence Unit (https://www.eiu.com/n/). The matched country for Mauritius is Costa Rica. All reported results are robust to the elimination of Mauritius.

procedure and associated diagnostic tests. We assign intuitive names for the three principal components by examining their correlations with the twelve underlying ICRG measures. The first component is designated as *business environment*, due to its correlation with the underlying ICRG *socioeconomic*, *investment profile*, *corruption*, *law and order*, and *bureaucracy quality* variables. The second component is labelled *safety from conflict*, from its correlation with the ICRG *internal conflict*, *external conflict*, *military*, and *religious tensions* measures. The third component is designated as *political stability*, and is most correlated with *government stability*, *ethnic tensions,* and *democratic accountability*. As the larger value for ICRG measures denote favorable characteristics or less risk, our new three component measures are constructed to follow the same rule. The only exception is that the *political stability* measure is negatively correlated with the underlying *democracy* variable. This suggests that frequent, and otherwise benign, democratic transfers of power may contribute a component of political instability.

3.3.Control variables

Our analysis employs control variables from the World Bank (World Development Indicator and Global Economic Monitor), DataStream, Federal Reserve Economic Data (FRED) Pacific Exchange Rate Services (PERS, available at: https://fx.sauder.ubc.ca/data.html), MSCI country indices. Jank (2012) shows that macroeconomic variables are associated with MF flows in the US. There also exists ample evidence that macroeconomic variables can be correlated across markets (Obstfeld, Rogoff, and Rogoff, 1996). Because of the potential correlation of macroeconomic variables across countries, but the conflicting evidence as to the association between macroeconomic variables and MF flows, we include a range of macroeconomic variables as controls without *a priori* hypotheses as to their direction or magnitude.

Our control variables include measures of GDP growth, GDP per capita, inflation, market capitalization, share turnover, and exchange rate stability. Ülkü and Baker (2014) find that world output volatility is significant in explaining cross-country equity market integration, while inflation, trade openness and world stock market volatility are insignificant. Ferreira, et al., (2013) show GDP growth is related to MF performance and that market capitalization and share turnover are related to MF performance. Karolyi, Lee, and van Dijk (2012) show that emerging markets display greater exposure to global equity market trading liquidity. This exposure is greater for countries with more volatility, higher inflows, weak legal protection, closed financial systems, and less transparency.

The World Development Indicators (WDI) database is the primary World Bank collection of development indicators, compiled from officially recognized international sources. We obtain annual data from WDI for GDP growth (in percentage), GDP per capita (in US dollars), and inflation (in percentage). *GDP growth* is the annual percentage growth rate in GDP at market prices based on constant local currency while *GDP per capita* is gross domestic product divided by midyear population. *Inflation* is measured as the annual growth rate of the GDP implicit deflator.

For the data for exchange rate stability, we use both DataStream and PERS to get the monthly exchange rate for all countries in our sample. Measures of exchange rate stability feature prominently in research on cross-country fund flows but may be less important for our focus on within-domicile flows. When available, we measure *exchange rate* changes by the percentage monthly change in real trade-weighted effective exchange rates. If real effective trade-weighted exchange rates are unavailable, then we compute effective exchange rates against a broad basket of major currencies to compute the monthly percentage change in exchange rates. If this is unavailable, then we use the percentage change in the exchange rate relative to the US dollar. Calderon and Kubota (2013) show that foreign exchange rate changes are strongly related to exposure to global shifts in liquidity.

We acknowledge that our list of macro-economic control variables is limited relative to those used in the published literature. In untabulated results we explore a wider range of additional control variables, such as interest rates, stock market turnover, legal system characteristics, market capitalization, educational attainment, internet coverage, and access to technology, as well as alternative measures of GDP growth and exchange rates. We exclude additional control variables from our reported results because of the drastic reduction in our sample coverage for additional control variables. For example, the next control variables with the broadest coverage are market capitalization and stock market turnover. However, these variables drop our sample domiciles from 63 to 24. Furthermore, these remaining domiciles are all developed markets, almost all from North America and Western Europe. Additional control variables reduce the sample coverage further and shift our coverage even more towards developed markets. Therefore, to preserve coverage of a wide range of domiciles, and especially of emerging markets, we restrict our models to the four macro-economic control variables listed above. Where possible, we confirm that our reported results are robust to the exclusion of these control variables.

4. Methods and models

4.1. Modeling cross-domicile return relationships

We begin by examining how domicile-level MF returns are associated with US MF returns. These models provide us with a benchmark from which to evaluate our models of cross-domicile MF flow relationships, as well as to judge how typical our dataset is relative to those documented in previous studies. Because the existing literature on cross-country return correlations employ a variety of different time-series specifications in their models, we begin by looking at how the time-series structure of cross-domicile return models affects our inferences about the extent to which worldwide markets follow the US with regard to returns:

$$Domicile\ return_{i,t} = \alpha_i + \beta_i\ US\ return_{i,t} + \varepsilon_{i,t}, \quad (2)$$

$$Domicile\ return_{i,t} = \alpha_i + \beta_i\ US\ return_{i,t-1} + \varepsilon_{i,t}, \quad (3)$$

$$Domicile\ return_{i,t} = \alpha_i + \beta_{1i}\ US\ return_{i,t} + \beta_{2i}\ US\ return_{i,t-1} + \varepsilon_{i,t}, \quad (4)$$

and,

$$Domicile\ return_{i,t} = \alpha_i + \beta_i\ World\ return_{i,t} + \varepsilon_{i,t}. \quad (5)$$

with *i* = domicile 1 to 62, excluding the US, and *t* indicates the month.

4.2.Modeling contemporaneous cross-domicile flow relationships

We propose the following two contemporaneous models to test for associations between each domicile's flow with world flow and US flow:

$$Domicile\ flow_{i,t} = \alpha_i + \beta_i\ World\ flow_{i,t} + \varepsilon_{i,t}. \quad (6)$$

and,

$$Domicile\ flow_{i,t} = \alpha_i + \beta_i\ US\ flow_{i,t} + \varepsilon_{i,t}. \quad (7)$$

To separate the effect of US flow that is correlated with world flow, we run a two-stage regression model, with the first stage having US flow as the dependent variable and world flow as the independent variable:

$$US\ flow_{i,t} = \alpha_i + \beta_i\ World\ flow_{i,t} + \varepsilon_{US\ flow,t}. \quad (8)$$

We label the residual of equation (8), $\varepsilon_{US\ flow,t}$, as the *idiosyncratic component of US flow*. This is the component of US flow that is uncorrelated with world flow and we use this residual as an explanatory independent variable in the second stage for a modified two-factor equation:

$$Domicile\ flow_{i,t} = \alpha_i + \beta_{1i}\ World\ flow_{i,t} + \beta_{2i} idiosyncratic\ component\ of\ US\ flow_{i,t} + \varepsilon_{i,t}. \quad (9)$$

4.3. Analyzing domicile-level market integration

We characterize the determinants of domicile flows by estimating the following models with our market-level governance measures:

$$Domicile\ flow_{i,t} = \gamma_0 + \gamma_1 Business\ environment_{i,t} + \gamma_2 Safety\ from\ conflict_{i,t} + \gamma_3 Political\ Stability_{i,t} + \boldsymbol{Controls_{i,t-1}}\ \boldsymbol{\psi} + \varepsilon_{i,t} \quad (10)$$

where *Domicile flow*$_{i,t}$ is drawn from our panel of flows for each domicile *i* in month *t*. $\boldsymbol{Controls_{i,t}}$ represents the vector of macro-economic control variables for each domicile *i* in month *t-1*: GDP growth, GDP per capita, inflation, and exchange rate stability. $\boldsymbol{\gamma}$ and $\boldsymbol{\psi}$ are vectors of coefficient estimates for each domicile *i*.

Next, we examine the market characteristics that are associated with increased or decreased associations between domicile flows and world flows. To do so, we add interaction terms to equation (10). The interactions capture the additional association between domicile flows and world flows in the presence of increased levels of each market characteristic:

$$Domicile\ flow_{i,t} = \gamma_0 + \gamma_1 Business\ environment_{i,t} + \gamma_2 Safety\ from\ conflict_{i,t} + \gamma_3 Political\ Stability_{i,t} + \gamma_4 Business\ environment_{i,t} * Worldflow_{i,t}$$

$$+ \gamma_5 Safety\ from\ conflict_{i,t} * Worldflow_{i,t} + \gamma_6 Political\ Stability_{i,t} * Worldflow_{i,t\ t}$$

$$+ \boldsymbol{Controls_{i,t-1}} \boldsymbol{\psi} + \boldsymbol{Controls_{i,t-1} * Worldflow_{i,t}} \boldsymbol{\phi} + \varepsilon_{i,t} \qquad (11)$$

5. Results

5.1. Return analysis

Table 2 presents coefficients estimates from models (2) to (5), where we examine how domicile returns are associated with US returns. Table 2 confirms findings from the previous literature that on average, domicile returns follow the US return. Table 2 shows that contemporaneous domicile returns are positively associated with the current US return, the lagged return of US, and the world return. These results are consistent with those reported for equity market returns by Bekaert, et al., (2009, 2011) and Rapach, et al., (2013).

The magnitude of associations reported in Table 2 is stronger with current US returns (equation 2) than with lagged US returns (equation 3): 76.19% of domiciles have a positive relationship with concurrent US returns and 65.08% show positive significant relation with lagged US returns. In the two-factor equation (equation 4), when we include both contemporaneous US return and lagged US return in our equation, we have a similar finding. In Appendix E, we report results for value-weighted (by lagged TNA) returns. The results become stronger and more significant for the VW models, indicating that larger markets are more strongly associated with the US than smaller markets.

5.2. Flow analysis

Table 3 reports the average (equal-weighted) estimates of equation (6), (7), and (9). The results show that most countries have positive estimates of β_i (85.71%) with 61.90% of the domiciles showing a positively significant association with world flow. Only one domicile

(Czechia, representing 1.59% of observations) has a negative and significant β_i. On the other hand, we find weak associations between domicile flows and US flows. Only a 4.76% of domiciles display a significant correlation with US flows. This is no different than may be expected by chance. Only one domicile (Poland, representing 1.59% of observations) has a significant negative estimate. For equation (9), when we include the component of US flow that is uncorrelated with world flow as a new explanatory independent variable, the results hold that domicile flows are associated with world flow, even after controlling for the $idiosyncratic\ component\ of\ US\ flow_{i,t}$.

One concern with the results reported in Table 3 is that we equally-weight domiciles, resulting in a large impact for small domiciles. In Appendix E, we report the results for our estimates of Equations (6), (7), and (9) when domiciles are value-weighted by lagged TNA. Value-weighting amplifies the results from Table 3, with more domicile flows correlated with world flow. Approximately 98.31% of countries in the sample have positive β_i when value-weighted and 88.64% are significantly positively associated with world flow. Again, Czechia (now representing a value-weight of 0.004% of observations) has a negative and significant correlation with world flow.

Appendix F provides detailed domicile-level results of the estimates from equations (6) and (7) that are reported in Table 3. In Table F1, forty countries have significant coefficients for world flow. Table F2 illustrates that the relationship between domicile flows and US flow is weaker, with only three countries demonstrating significant associations with US flow. India and Luxembourg have significant positive associations with the US, while Poland is the only domicile which displays a significant negative association with the US, while Japan displays a marginally significant negative coefficient estimate.

In Tables 2 and 3, we reported summary statistics on estimation results when equations (2) through (9) were estimated for each individual domicile. Domicile level estimates were essential to examine cross- market variation in the association of countries' flows with US and world flows. We now estimate panel models with one-way cross-sectional fixed effects at the domicile level and controls for heteroscedasticity and autocorrelation.

Results for panel regression models are presented in Table 4. Domicile fixed-effects help to address the concern that summary regression results in Tables 2 and 3 are unduly influenced by which domiciles enter or exit our sample over time (a concern raised by Pukthuanthong and Roll, 2009, in the context of tests of market integration). In Table 4, we re-estimate equations (6), (7), (9), (16), and (17), and find that the results are comparable to the summary results from domicile-by-domicile regression models: there is strong global component in domicile-level fund flows, but no strong role for the US. Domicile flows are positively and significantly correlated with contemporaneous world flow, with β_i of 0.911 and are insignificantly associated with lagged world flow. The results are similar for the two-factor equation (eq. 9) of world flow and residual of US flow.

5.3.Market characteristics and integration with global liquidity trends

Our analysis, thus far, documents widespread significant positive domicile-level associations between domicile fund flows and worldwide fund flows. Table 5 displays summary statistics of our data on market-level characteristics. Market-level measures are summarized for all markets, emerging markets, and developed markets. We generally see lower levels of the ICRG measures for emerging markets compared to developed markets (larger values denote more favorable characteristics or less risk). Developed markets have higher levels of GDP per capital, lower GDP growth, lower inflation rates, and similar levels of exchange rate changes.

Table 6, Panel A shows the results for our equation (10), while Panel B displays results for estimates of equation (11). Column 1 of Panel A presents descriptive regressions illustrating how the level of domicile flows are associated with governance and macro-economic indicators. It indicates that the level of domicile fund flows tends to be higher when markets have better scores regarding *Business environment* and *Political stability*. The results are driven by emerging markets in the post-2008 period. *GDP per capita*, is negatively associated with fund flows, but only for emerging markets in the post-2008 period. *GDP growth* is generally positively associated with fund flows. The irrelevance of exchange rate changes suggests that commonality in the market for asset management is distinct from what has been observed in equity markets. Karolyi, et al., (2012), found that commonality in equity returns is greater when the local currency depreciates (as this may attract foreign investors) and Bekaert, et al., (2013) found exchange rate volatility was not associated with increased integration in European countries.

Panel B of Table 6 demonstrates how integration with global liquidity varies with market characteristics. In these models, a significant interaction term implies that integration increases with higher levels of each socio-political measure. The results suggest that integration increases with higher values for *Business environment* and *Safety from conflict*. Integration decreases with better measures for *Political stability*. As the ICRG measures are constructed such that higher values correspond to more favorable outcomes, we can interpret these results as capturing two opposing aspects of market integration. Successful management of the *Business environment* and *Safety from conflict* allow a market to increase MF investment during periods of global liquidity. More stable political systems serve to insulate a market's asset management industry from erratic trends in excess global liquidity. We do not observe evidence that our macroeconomic control variables are associated with time-varying market integration. The results are consistent across subsamples for both emerging and developed markets.

Overall, our findings lead to mixed results for our 2nd hypothesis test. Our 2nd hypothesis implied that we may observe a negative coefficient estimate for the interaction between global fund flows and governance measures. We do observe a strong negative association between *Political stability* and market integration. However, better governance measures are more often associated with increased (i.e., positive coefficient estimates) integration, rather than segmentation. This implies that investors in markets with good governance act pro-cyclically in relation to global trends in MF liquidity. This could be interpreted as a potential downside to good governance, if it means that well-governed markets become more exposed to erratic trends in liquidity. However, it more likely implies that well-governed markets are better able to attract investment to their asset management industry when liquidity is available.

For our 3rd hypothesis test, the results from Table 6 suggest that emerging markets are more segmented from global liquidity while developed markets are more integrated. This evidence again suggests that commonality in the market for asset management is distinct from what has been observed in equity markets, as these results are contrary to those of Karolyi, et al., (2012) and Bai and Qin (2015).

6. Robustness checks and extensions

6.1. Analysis of lagged flow associations

Appendix G reports estimates for a variety of models that incorporate a wider range of lead-lag relationships between domicile flows, world flows, and US flows, with and without vector-autoregression specifications. To summarize, domicile flows are only weakly associated with lagged world flow and insignificantly associated with lagged US flow. Overall, the results confirm that domicile flows are associated with contemporaneous world flow, but largely unrelated to lagged world flow, current US flow, or lagged US flow.

6.2. Analysis based on asset class

There is substantial evidence for differences in international capital flow dynamics between bond and equity markets. Sarno, Tsiakis, and Ulloa (2016) document that the relative contribution of push and pull factors differs across equity and bond cross-country portfolio flows. Raddatz and Schmukler (2012) find that when there is a shock in a country where funds invest, equity funds tend to increase the shock by acting pro-cyclically, while bond funds might help transmit shocks across countries by acting counter-cyclically in that country.

To examine potential differences across asset classes, we separate our fund-level data into bond and equity funds and re-run domicile-level flow aggregation and our analysis. We examine emerging and developed markets separately, and we partition our sample into sub-periods based on data availability (most emerging markets only have sufficient observations for the post-2008 period). We predict that our results will be stronger for the sub-sample of equity funds. Conceptual arguments can be made for relatively stronger associations for either equity or bond subsamples. If equity funds are more pro-cyclical, as implied by the work of Raddatz and Schmukler (2012), then an equity-only sample should display a stronger association with word flows, but not necessarily socio-political variables. However, if bond flows are more sensitive to government fiscal, monetary, and institutional policies, then the socio-political interaction terms may be more strongly associated with bond-only fund flows. We examine these questions empirically through the results in Table 7.

Panel A of Table 7 presents how market integration in asset management varies with market characteristics for equity funds. The overall integration for equity funds is comparable to the results reported in Table 6, Panel B, both for the full sample of equity funds and for the emerging and developed-market subgroups. We also observe similar patterns, but at a weaker magnitude, for our socio-political indicators and interaction terms. For equity funds, integration increases with better values for *Business environment* and *Safety from conflict* and decreases with better measures for *Political stability*. This means that during periods of global fund flow liquidity, good management of *Business environment* and *Safety from conflict* helps a market to generate more MF equity investment, while successful management of *Political stability* subdues a market's changes in fund-based equity investment in the presence of erratic trends in global liquidity. Bond fund flows differ primarily in the association with *Safety from conflict*. While equity fund flows become more sensitive to global liquidity in the presence of better *Safety from conflict* measures, bond funds display the opposite pattern: bond funds become more segmented from global liquidity when markets have less *Safety from conflict*.

6.3. Analysis based on region

It is well documented that Europe and Asia act as distinct regions for intra-regional financial flows (Puy, 2016; Ferreira, et al., 2013). Therefore, we examine these regions more closely. We create a subsample of the 31 European markets present in our data and a subsample of twelve Asia-Pacific markets. We identify the top domiciles, based on TNA coverage, in each region. The top markets in the European area are Luxembourg, Ireland, the UK, France, Switzerland, and Germany. The top markets in Asia and the Pacific are Japan, India, Australia, China, and Singapore.

We expand our methods from section 3.1, to consider the predictive power of leading markets' fund flows within each region. We replace *world flow* with the flow for the top markets in each region. For each domicile i, we compute total flow for the *rest of Europe* or *rest of Asia* as the lagged-TNA-weighted average monthly flows across all domiciles in the region with valid domicile flows each month, not including domicile i and the top domiciles in that region. We construct a *rest of world* flow measure analogously. We estimate the following models:

$$Domicile\ flow_{i,t} = \alpha_i + \sum_{n=1}^{6} \beta_n\ Top\ domiciles\ flows_{i,t-1} +$$

$$\beta_7\ rest\ of\ Europe\ flows_{t-1} + \beta_8\ US\ flows_{t-1} + \beta_9\ rest\ of\ world\ flow_{t-1} + \varepsilon_{i,t} \quad (12)$$

and

$$Domicile\ flow_{i,t} = \alpha_i + \sum_{n=1}^{5} \beta_n\ Top\ domiciles'flows_{i,t-1} +$$

$$\beta_6\ rest\ of\ Asia\ flows_{t-1} + \beta_7\ US\ flows_{t-1} + \beta_8\ rest\ of\ world\ flow_{t-1}\ \varepsilon_{i,t}. \quad (13)$$

Table 8 reports average (equal-weighted) summary statistics of domicile-by-domicile estimates equation (16) and (17). Panel A of Table 8 suggests that domicile-by-domicile regressions are a weak test for flow dynamics, as there tend to be only small number of monthly observations for many domiciles. The results in Panel B for equation (16) provide weak evidence of a US role, with 80% of European markets being positively associated with lagged US flows, but with only 8% of European markets displaying a significant association with US flow. The results for Asia show that Singapore takes a weak leading role in predicting individual Asian domiciles' flows. About 29% of Asian domiciles have a positive and significant association with lagged Singaporean flows.

Table 9 presents our more powerful panel estimation, with domicile fixed effects, of equations (16) and (17), with Europe in Panel A and Asia in Panel B. Patterns in European flows are mixed. Luxembourg is the strongest leading domicile, significantly predicting flows to Ireland, the UK, France, and Germany. German flows are a contrarian indicator of other European flows, being significantly negatively associated with future flows to Luxembourg, the UK, and France. Overall, the evidence is consistent with the European (including the UK, prior to Brexit) market for asset management being segmented from global liquidity trends, with Luxembourg as the local leader. Switzerland is the exception, appearing segmented from Europe, and as the only major European domicile to be more integrated with the US.

In Asia (Table 9, Panel B), there is no apparent leading domicile serving a role analogous to Luxembourg in Europe. Australian flows follow Japan; Japanese flows follow China; Chinese flows are unrelated to other Asian markets; and Indian flows are unrelated to other Asian markets and are inversely related to lagged US flows. A weak leading role for Singapore is limited to smaller fund markets (i.e., Hong Kong, South Korea, Malaysia, New Zealand, the Philippines, Taiwan, and Thailand), captured by the significant estimate on the *rest of Asia* term for Singapore. The results in Table 9, Panel B, indicate weak intra-Asian integration in the market for asset management.

6.4. Offshore financial centers

In Appendix H, we consider the influence of offshore domiciles. We examine estimates of equations (6) and (11) for two subsamples. First, we restrict the sample to only offshore centers and micro-territories: Andorra, the Bahamas, Gibraltar, Guernsey, Hong Kong, the Isle of Man, Liechtenstein, Malta, Mauritius, and Monaco. We are motivated by Coppola, et al., (2021), who document the growing importance of offshore domiciles in determining patterns in global fund flows. Second, we re-examine the full-sample results, but excluding the fund hubs of Luxembourg and Ireland, as well as the offshore domiciles listed above. Rakowski (2021) demonstrates that across-country models of domicile-level fund flows can be distorted by Luxembourg and Ireland. Both sets of analyses give results that are qualitatively similar to those reported in the mainline regressions of Tables 3, 4 (equation 6), and 6 (equation 11).

7. Conclusion and directions for future research

Our research accomplishes three goals. First, we examine mutual funds' return correlations across domiciles and show that the US does not lead or explain other domiciles' MF flow patterns. Second, we provide comprehensive and detailed stylized facts about mutual fund flows across domiciles and how individual domicile's flows correlate with world flows. Third, we show that market-level characteristics are associated with global integration or segmentation of each domicile's asset management industry. Unlike most existing studies, we focus on the domicile in which flows originate, rather than the destination where flows are allocated.

It is important to understand the global structure of MF flow associations. Previous studies document the crucial role of flow management for asset managers. Our measurements of MF correlations provide valuable data on this issue. Our results show that the cross-domicile structure of liquidity correlations is very different from that of return correlations. Although the US dominates in terms of a leading signal of MF returns, there is no evidence that US MF flows lead or concurrently explain MF flows of other domiciles, apart from some regional flows in Asia. Segmented markets represent potential diversification opportunities for asset management firms. In such markets, asset managers could reasonably hope to maintain fee income and cross-fund trading opportunities when other markets suffer liquidity contractions.

While certain domiciles are likely to represent flows from domestic investors, and thus capture local demand for asset management (Ferreira, et al., 2012), other domiciles are more likely to represent demand from external investors who select a favored domicile for their asset management allocations (Koepke, et al., 2020; Alfaro, et al., 2020; Coppola et al., 2021). This choice of trading venue, especially across domiciles, is closely related to the liquidity characteristics of competing markets (Karolyi, Lee, and van Dijk, 2012). Because we analyze fund flows at the domicile level, our analysis centers on how, and why, investors direct funds to one legal jurisdiction over another. Our results imply that this choice is closely tied to certain measures of financial development, market size, and macro-economic conditions of each domicile. However, these preferences for a domicile also change over time, depending on global liquidity. In periods of ample global liquidity, equity fund flows are higher in domiciles with better scores for the *business environment* and *safety from conflict*. This is consistent with "reaching for yield" that has been observed for equity (Efing, 2020), debt (Becker and Ivashina, 2015), and derivatives markets (Remolona and Schrijvers, 2003). Flows are more stable in markets with more *political stability*, even though this may correspond to less democratic political systems.

Our MF flow correlation analysis raises interesting questions about the relative efficiency of different markets. Strong cross-domicile associations in returns suggest that cross-domicile arbitrage is likely to be successful in eliminating cross-domicile informational inefficiencies that lead to price distortions in underlying securities. However, Eun, et al., (2008) show that international diversification involves a capacity constraint biased toward large-cap stocks, which dominate MF allocations. Dermine and Roller (1992) provide evidence about diseconomies of scale and scope of French mutual funds, while Ferreira, et al., (2013) find that funds located outside the US are not negatively affected by scale. Our results showing a lack of strong cross-domicile flow correlations imply that differences in economies of scale could persist in the global market for asset management, in that MF assets do not appear to flow across borders to those managers or strategies that are most productive. Instead, our results suggest that domicile boundaries have effectively segmented the global market for asset management into discrete regional and national jurisdictions, and this segmentation has shown no signs of lessening in recent years.

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TABLES

Table 1: Descriptive statistics of domicile-level sample data

Panel A: Descriptive Statistics of world-level measures

The table reports descriptive statistic of world level data for 63 sample MF domiciles, over the period from 1996 to 2020. World flow and world return are constructed as the TNA-weighted average monthly flow and return, respectively, across all countries, not including the US or domicile *i*, with valid domicile flows and returns each month. Reported statistics are over all sample months.

Variable	Mean	Median	Minimum	Maximum	Std Dev	*N*
World flow	0.18%	0.22%	-7.00%	5.64%	1.69%	287
US flow	0.31%	0.25%	-0.91%	3.15%	0.52%	287
World return	-0.21%	0.22%	-39.25%	37.87%	6.57%	287
US return	0.50%	0.90%	-10.86%	6.09%	2.44%	287

Panel B: Domicile-level descriptive statistics

The table reports summary statistics for monthly observations for 63 domiciles. Average TNA (in USD), return, and flow (in percentage, local currency) are computed from EPFR, Morningstar, or CRSP data. We aggregate TNA, returns, and flows across classes when there are multi-share classes of a fund, and then aggregate across all funds in each domicile.

#	Domicile	Number of months	Start Date	End Date	TNA ($000,000)	Monthly Return	Annualized Return	Monthly Flow
1	Andorra	107	201102	201912	804.42	0.06%	0.68%	-1.33%
2	Australia	182	200411	201912	87946.15	0.45%	5.41%	0.63%
3	Austria	227	200001	201912	17176.03	0.41%	4.93%	0.11%
4	Bahamas	204	199707	201912	159.77	0.39%	4.73%	-1.00%
5	Bahrain	39	200611	201107	276.09	-1.55%	-18.65%	-2.07%
6	Belgium	287	199602	201912	20449.76	0.28%	3.34%	-0.22%
7	Brazil	122	200911	201912	3621.2	1.43%	17.15%	-1.03%
8	Bulgaria	57	201504	201912	104.95	-0.02%	-0.27%	-0.22%
9	Canada	287	199602	201912	300661.71	0.23%	2.74%	-0.32%
10	Chile	15	201810	201912	3360.79	0.56%	6.66%	-0.28%
11	China	81	201304	201912	31840.88	0.97%	11.65%	-0.42%
12	Columbia	76	201309	201912	8887.42	1.13%	13.51%	-0.09%
13	Czechia	101	201104	201912	633.82	-0.19%	-2.33%	0.03%
14	Denmark	260	199805	201912	4813.78	0.40%	4.85%	-0.14%
15	Estonia	163	200509	201912	179.76	0.41%	4.97%	-0.78%
16	Finland	181	200412	201912	10749.1	0.29%	3.47%	0.11%
17	France	273	199704	201912	257477.99	0.02%	0.21%	0.34%
18	Germany	230	200001	201912	141635.67	0.24%	2.93%	-0.19%
19	Gibraltar	95	201102	201912	59.74	-0.04%	-0.50%	-0.10%
20	Greece	131	200902	201912	335.1	0.07%	0.88%	-1.94%
21	Guernsey	107	201102	201912	10613.93	0.25%	2.99%	-1.07%
22	Hong Kong	266	199602	201912	17874.69	0.49%	5.88%	0.29%
23	Hungary	74	201102	201703	201.32	0.13%	1.58%	-2.00%
24	India	106	201101	201912	161567.87	1.03%	12.34%	0.07%
25	Indonesia	18	201707	201912	43.88	0.09%	1.07%	7.80%
26	Ireland	287	199602	201912	462283.9	0.28%	3.40%	0.61%
27	Isle of man	106	201102	201911	376.1	0.05%	0.56%	0.22%
28	Israel	67	201304	201810	23350.14	0.45%	5.41%	0.05%
29	Italy	114	201007	201912	136529.94	0.01%	0.11%	-0.71%
30	Japan	132	200001	201912	353557.62	0.36%	4.34%	-0.14%
31	Korea	103	200001	201912	18657.57	-0.12%	-1.49%	0.99%
32	Kuwait	139	200804	201912	2411.9	-0.04%	-0.45%	-0.52%

#	Domicile	Number of months	Start Date	End Date	TNA ($000,000)	Monthly Return	Annualized Return	Monthly Flow
33	Liechtenstein	188	200403	201912	15339.37	0.13%	1.53%	-0.55%
34	Luxembourg	287	199602	201912	1088497.24	0.22%	2.64%	0.41%
35	Malaysia	93	201204	201912	394.64	0.57%	6.79%	0.35%
36	Malta	107	201102	201912	1133.78	0.16%	1.92%	-0.30%
37	Mauritius	275	199702	201912	1960.91	1.02%	12.30%	-0.17%
38	Mexico	122	200911	201912	3234.94	0.78%	9.41%	-1.84%
39	Monaco	107	201102	201912	829.27	0.06%	0.77%	0.44%
40	Netherlands	212	200001	201912	21079.79	0.00%	-0.01%	-0.69%
41	New Zealand	143	200802	201912	1276.2	0.63%	7.53%	0.39%
42	Nigeria	47	201601	201912	14.16	0.38%	4.58%	-0.83%
43	Norway	106	201103	201912	36613.34	0.92%	11.00%	-0.45%
44	Pakistan	21	201804	201912	3172.62	1.53%	18.34%	-1.67%
45	Philippines	107	201102	201912	5794.58	0.19%	2.28%	1.06%
46	Poland	10	201903	201912	63.95	0.50%	5.98%	7.96%
47	Portugal	71	201102	201612	4577.02	-0.35%	-4.26%	-0.26%
48	Qatar	58	201201	201911	116.41	0.80%	9.64%	0.28%
49	Romania	57	201504	201912	3032.34	0.33%	4.01%	-0.94%
50	Russia	107	201102	201912	1875.69	0.40%	4.82%	0.69%
51	Saudi Arabia	106	201102	201912	8722.01	0.24%	2.94%	0.45%
52	Singapore	285	199602	201912	4477.03	0.09%	1.06%	-0.21%
53	Slovenia	80	201102	201912	516.1	0.02%	0.21%	-0.11%
54	South Africa	125	200908	201912	12167.41	1.29%	15.50%	-0.31%
55	Spain	114	201007	201912	51059.91	0.26%	3.07%	-0.02%
56	Sweden	208	200001	201912	72288.25	0.67%	8.02%	0.68%
57	Switzerland	287	199602	201912	139602.12	0.06%	0.71%	-0.17%
58	Taiwan	133	200001	201912	6544.44	0.31%	3.74%	0.35%
59	Thailand	84	201301	201912	53993.61	0.16%	1.89%	-0.13%
60	Turkey	153	200704	201912	73.58	1.95%	23.36%	-1.12%
61	UAE	107	201102	201912	607.08	0.48%	5.78%	-0.92%
62	UK	287	199602	201912	368449.89	0.49%	5.90%	0.03%
63	USA	287	199602	201912	12094298.33	0.50%	6.00%	0.31%

Panel C: Descriptive Statistics for flow correlation matrix

	Total pairs	Total pairs with positive correlation	Total pairs with negative correlation	Total pairs with missing correlation
Number	1,954	1,335	594	25
Percentage	100%	68.32%	30.40%	1.28%

Top 5 correlations			
Positive		Negative	
Romania-Austria	0.841	Bahrain-Andorra	-0.759
Romania-Germany	0.837	Pakistan-Gibraltar	-0.635
Romania-Luxembourg	0.798	Poland-Greece	-0.579
Austria-Luxembourg	0.793	Poland-Bahamas	-0.532
Romania- Finland	0.782	Slovenia-Pakistan	-0.527

Table 2: Domicile-level return analysis

The table reports average *t*-statistic, beta coefficient, R^2 , adjusted R^2 (Panel A) and the proportion of coefficient estimates that are positive or negative (Panel B) for following regression models:

$$Domicile\ return_{i,t} = \alpha_i + \beta_i\ US\ return_{i,t} + \varepsilon_{i,t}, \quad (2)$$

$$Domicile\ return_{i,t} = \alpha_i + \beta_i\ US\ return_{i,t-1} + \varepsilon_{i,t} \quad (3)$$

$$Domicile\ return_{i,t} = \alpha_i + \beta_{1i}\ US\ return_{i,t} + \beta_{2i}\ US\ return_{i,t-1} + \varepsilon_{i,t} \quad (4)$$

$$Domicile\ return_{i,t} = \alpha_i + \beta_i\ World\ return_{i,t} + \varepsilon_{i,t}, \quad (5)$$

with i = 1 to 62, excluding the US. Column (2) reports statistics from the estimation of equation (2), column (3) reports statistics from the estimate of equation (3), columns (4a) and (4b) report statistics from the estimate of equation (4), and column (5) reports statistics from the estimate of equation (5). Each model is run separately for each domicile *i*. The table reports equally-weighted average coefficient estimates and *t*-statistics across domiciles, the proportion of coefficient estimates that are positive or negative, and significant or insignificant at the 95% level. *N* reports the average number of monthly observations across domiciles.

Panel A: Average *t*-statistic, beta coefficient

	(2)	**(3)**	**(4)**		**(5)**
			(a)	**(b)**	
	Average β_i	**Average β_i**	**Average β_{1i}**	**Average β_{2i}**	**Average β_i**
Average coefficient estimate	0.655	0.127	0.653	0.130	0.598
Average *t*-statistic	4.90	0.69	5.02	0.87	7.28
R^2	25.75%	2.60%	27.66%		29.16%
Adjusted R^2	24.66%	1.27%	25.34%		28.10%
N	143.03	142.03	142.03		143.03

Panel B: Proportion of coefficient estimates that are positive or negative

	Proportion	**Proportion**	**Proportion**		**Proportion**
Positive beta	76.19%	65.08%	76.19%	71.43%	87.30%
Negative beta	23.81%	34.92%	23.81%	26.98%	12.70%
Positive significant beta	66.67%	15.87%	66.67%	17.46%	69.84%
Negative significant beta	7.94%	1.59%	6.35%	1.59%	1.59%

Table 3: Domicile-level contemporaneous flow analysis

The table reports average *t*-statistic, beta coefficient, R^2 , adjusted R^2 (Panel A) and the proportion of coefficient estimates that are positive or negative (Panel B) for the following regression models:

$$Domicile\ flow_{i,t} = \alpha_i + \beta_i\ World\ flow_{i,t} + \varepsilon_{i,t} \quad (6)$$

$$Domicile\ flow_{i,t} = \alpha_i + \beta_i\ US\ flow_{i,t} + \varepsilon_{i,t} \quad (7)$$

$$Domicile\ flow_{i,t} = \alpha_i + \beta_{1i}\ World\ flow_{i,t} + \beta_{2i}\ idiosyncratic\ component\ of\ US\ flow_{i,t} + \varepsilon_{i,t} \quad (9)$$

With i = 1 to 62, excluding the US. Column (6) reports statistics from the estimate of equation (6), column (7) reports statistics from the estimate of equation (7), and columns (9a) and (9b) report statistics from the estimate of equation (9). Each model is run separately for each domicile *i*. The table reports equally-weighted average coefficient estimates and *t*-statistics across domiciles, the proportion of coefficient estimates that are positive or negative, and significant or insignificant at the 95% level. *N* reports the average number of monthly observations across domiciles.

Panel A: Average *t*-statistic, beta coefficient

			(9)	
	(6)	(7)	(a)	(b)
	Average β_i	Average β_i	Average β_{1i}	Average β_{2i}
Average coefficient estimate	0.887	0.085	0.887	-0.232
Average *t*-statistic	4.284	0.013	4.347	-0.275
R^2	16.87%	2.69%	19.46%	
Adjusted R^2	15.71%	1.42%	17.15%	
N	143.03	143.03	143.03	

Panel B: Proportion of coefficient estimates that are positive or negative

	Proportion	Proportion	Proportion	
Positive beta	85.71%	53.97%	85.71%	39.68%
Negative beta	14.29%	46.03%	14.29%	60.32%
Positive significant beta	61.90%	4.76%	63.49%	4.76%
Negative significant beta	1.59%	1.59%	1.59%	4.76%

Table 4: Domicile-level panel flow analysis

This table reports panel analysis from January of 2000 to December 2019. The dependent variable is *domicile flow*. *t*-statistics are reported below each coefficient estimate. * significant at 10%; ** significant at 5%; *** significant at 1%.

	Equation		
	(6)	**(7)**	**(9)**
World flow$_t$	0.911***		0.911***
	(9.34)		(9.33)
US flow$_t$		0.058	
		(0.44)	
World flow$_{t-1}$			
US flow$_{t-1}$			
Idiosyncratic component of US flow$_{i,t}$			-0.201*
			(-1.64)
N (domiciles)	62	62	62
N (max months)	239	239	239
N (domicile-months)	8,168	8,168	8,168
Domicile fixed effects	Yes	Yes	Yes
Month fixed effects	Yes	Yes	Yes
R^2	11.43%	2.62%	11.46%

Table 5: Summary statistic of market-level characteristics

Panel A: ICRG variables

	Business environment	*Safety from conflict*	*Political stability*
All markets	0.03	-0.01	-0.02
Emerging markets	-1.07	-0.29	0.08
Top 3 markets	Korea, UAE, Qatar	Bahamas, Malta, Mauritius	Qatar, UAE, Saudi Arabia
Bottom 3 markets	Nigeria, South Africa, Romania	Pakistan, Turkey, Indonesia	India, Andorra, Pakistan
Developed markets	0.60	0.14	-0.07
Top 3 markets	Israel, Norway, Denmark	Finland, Luxembourg, Italy	Singapore, Hong Kong, Luxembourg
Bottom 3 markets	Italy, Portugal, Spain	Israel, Monaco, USA	Monaco, Isreal, Spain

Panel B: Macro control variables

	GDP per capita	*GDP growth*	*Inflation*	*Exchange rate*
All markets	10.05	2.59%	2.39%	-0.009%
Emerging markets	9.36	3.14%	3.29%	-0.006%
Top 3 markets	Qatar, UAE, Kuwait	China, India, Philippines	Nigeria, Turkey, Russia	Qatar, Saudi Arabia, Nigeria
Bottom 3 markets	Pakistan, India, Nigeria	Greece, Brazil, Nigeria	Qatar, Greece, UAE	Brazil, Hungary, Turkey
Developed markets	10.73	2.04%	1.48%	-0.012%
Top 3 markets	Luxembourg, Norway, Liechtenstein	Ireland, Singapore, Luxembourg	Australia, Luxembourg, Ireland	Israel, Liechtenstein, USA
Bottom 3 markets	Portugal, Hong Kong, Spain	Portugal, Italy, Japan	Japan, Liechtenstein, Switzerland	Japan, Norway, Sweden

Table 6, Panel A: Market characteristics and market integration

This table reports estimates from the following model:

$$Domicile\ flow_{i,t} = \gamma_0 + \gamma_1 Business\ environment_{i,t} + \gamma_2 Safety\ from\ conflict_{i,t} + \gamma_3 Political\ Stability_{i,t} + \boldsymbol{Controls_{i,t-1}}\,\boldsymbol{\psi} + \varepsilon_{i,t} \quad (10)$$

t-statistics are reported below each coefficient estimate. * significant at 10%; ** significant at 5%; *** significant at 1%.

	All markets, full period	Developed markets, full period	Developed markets, post 2008	Emerging markets, post-2008
Intercept	0.034*	0.021	0.054*	0.069***
	(1.93)	(0.90)	(1.80)	(2.72)
Business environment$_{i,t}$	0.004***	-0.001	-0.002*	0.004**
	(3.62)	(-1.16)	(-1.72)	(2.01)
Safety from conflict$_{i,t}$	0.000	-0.001	-0.001	0.002
	(0.46)	(-1.31)	(-1.37)	(1.46)
Political stability$_{i,t}$	0.002**	0.000	0.001	0.005***
	(2.17)	(0.49)	(1.37)	(4.01)
GDP per capita $_{t-1}$	-0.002	0.000	-0.003	-0.007***
	(-1.60)	(-0.02)	(-1.10)	(-3.15)
GDP growth $_{t-1}$	0.041	0.049**	0.073***	0.0900**
	(1.23)	(2.27)	(2.87)	(2.21)
Inflation $_{t-1}$	0.089	0.024	0.000	-0.010
	(0.84)	(0.72)	(0.01)	(-0.46)
Exchange rate $_{t-1}$	-0.009	-0.021	-0.026	-0.023
	(-0.19)	(-0.39)	(-0.42)	(-0.34)
N (domiciles)	58	29	29	29
N (max months)	275	275	144	144
N (domicile-months)	8,295	5,422	3,694	2,613
Domicile fixed effects	Yes	Yes	Yes	Yes
Month fixed effects	Yes	Yes	Yes	Yes
R^2	13.99%	21.42%	22.08%	13.64%

Table 6, Panel B: Market characteristics and market integration

This table reports estimates from the following model:

$$\textit{Domicile flow}_{i,t} = \gamma_0 + \gamma_1 \textit{Business environment}_{i,t} + \gamma_2 \textit{Safety from conflict}_{i,t} + \gamma_3 \textit{Political Stability}_{i,t} + \gamma_4 \textit{Business environment}_{i,t} * \textit{Worldflow}_{i,t} + \gamma_5 \textit{Safety from conflict}_{i,t} * \textit{Worldflow}_{i,t} + \gamma_6 \textit{Political Stability}_{i,t} * \textit{Worldflow}_{i,t} + \textbf{Controls}_{i,t-1}\psi + \textbf{Controls}_{i,t-1} * \textbf{Worldflow}_{i,t}\phi + \varepsilon_{i,t} \quad (11)$$

t-statistics are reported below each coefficient estimate. We require at least 24 months of valid data for a domicile to be included in our sample. * significant at 10%; ** significant at 5%; *** significant at 1%.

	All markets, full period	Developed market, full period	Developed markets, post- 2008	Emerging markets, post-2008
$Worldflow_{i,t}$	-7.835***	-6.481***	-9.629***	-55.974***
	(-5.70)	(-16.17)	(-12.92)	(-13.14)
$Business\ environment_{i,t}$	-0.004	-0.005*	-0.014**	-0.005
	(-1.20)	(-1.76)	(-2.48)	(-0.74)
$Business\ environment_{i,t} *Worldflow_{i,t}$	0.083**	0.481***	0.563***	-0.066
	(2.16)	(8.67)	(10.05)	(-0.57)
$Safety\ from\ conflict_{i,t}$	-0.002	-0.004**	-0.009**	0.009
	(-0.74)	(-2.04)	(-2.32)	(1.26)
$Safety\ from\ conflict_{i,t} *Worldflow_{i,t}$	0.122**	0.474***	0.563***	-0.020
	(2.16)	(7.95)	(7.59)	(-0.23)
$Political\ Stability_{i,t}$	0.003*	0.002	0.004	0.008*
	(1.74)	(1.52)	(1.49)	(1.78)
$Political\ Stability_{i,t}*Worldflow_{i,t}$	-0.226***	-0.183***	-0.196***	-0.269***
	(-7.38)	(-6.01)	(-6.10)	(-3.48)
$GDPcapital2010_{t-1}*Worldflow_{i,t}$	0.013	0.007	-0.026	0.008
	(0.56)	(0.41)	(-1.37)	(0.11)
$GDPgrowth_{t-1}*Worldflow_{i,t}$	-1.130	0.327	0.581	-1.663
	(-0.95)	(0.35)	(0.58)	(-0.78)
$Inflation_{t-1}*World\ flow_{i,t}$	2.571	-1.582	-2.127	-0.067
	(1.53)	(-0.97)	(-1.08)	(-0.06)
$Exchange\ rate_{t-1}*Worldflow_{i,t}$	1.676	-1.680	-2.323*	4.775
	(0.93)	(-1.28)	(-1.60)	(1.29)
N (domiciles)	58	29	29	29
N (max months)	275	275	144	144
N (domicile-months)	8,295	5,422	3,694	2,613
Domicile fixed effects	Yes	Yes	Yes	Yes
Month fixed effects	Yes	Yes	Yes	Yes
R^2	21.41%	30.48%	32.83%	21.48%

Table 7, Panel A: Market characteristics and market integration, equity funds

This table reports estimates from the following model:

$$Domicile\ flow_{i,t} = \gamma_0 + \gamma_1 Business\ environment_{i,t} + \gamma_2 Safety\ from\ conflict_{i,t} + \gamma_3 Political\ Stability_{i,t} + \gamma_4 Business\ environment_{i,t}{*}Worldflow_{i,t} + \gamma_5 Safety\ from\ conflict_{i,t}{*}Worldflow_{i,t} + \gamma_6 Political\ Stability_{i,t}{*}Worldflow_{i,t} + \boldsymbol{Controls_{i,t-1}\psi} + \boldsymbol{Controls_{i,t-1}{*}Worldflow_{i,t}\phi} + \varepsilon_{i,t}. \quad (11)$$

t-statistics are reported below each coefficient estimate. We require at least 24 months of valid data for a domicile to be included in our sample. Domicile flows are restricted to those from equity mutual funds. * significant at 10%; ** significant at 5%; *** significant at 1%.

	All markets, full period	Emerging markets, post-2008	Developed markets, full period	Developed markets, post-2008)
$Worldflow_{i,t}$	-5.894***	-141.488***	-5.056***	-9.340***
	(-6.83)	(-12.35)	(-15.09)	(-12.08)
$Business\ environment_{i,t}$	-0.001	0.009	-0.002	-0.006
	(-0.29)	(0.70)	(-1.07)	(-1.58)
$Business\ environment_{i,t}$ $*Worldflow_{i,t}$	0.0483	0.0522	0.264***	0.346***
	(0.87)	(0.36)	(4.89)	(6.02)
$Safety\ from\ conflict_{i,t}$	-0.0002	0.001	-0.001	-0.006
	(-0.07)	(0.12)	(-1.02)	(-1.57)
$Safety\ from\ conflict_{i,t}*Worldflow_{i,t}$	0.223***	0.108	0.387***	0.470***
	(2.63)	(0.74)	(7.03)	(6.62)
$Political\ Stability_{i,t}$	0.004***	0.002	0.004***	0.005*
	(2.50)	(0.41)	(3.52)	(1.80)
$Political\ Stability_{i,t}*Worldflow_{i,t}$	-0.201***	-0.207*	-0.196***	-0.207***
	(-5.54)	(-1.63)	(-6.40)	(-6.16)
$GDPcapital2010_{t-1}*Worldflow_{i,t}$	0.026	0.016	0.014	-0.026
	(1.05)	(0.09)	(0.86)	(-0.79)
$GDPgrowth_{t-1}*Worldflow_{i,t}$	-0.291	3.786	-0.294	-0.161
	(-0.14)	(0.85)	(-0.28)	(-0.14)
$Inflation_{t-1}*Worldflow_{i,t}$	4.388	-3.776	0.781	0.692
	(1.31)	(-1.45)	(0.49)	(0.34)
$Exchange\ rate_{t-1}*Worldflow_{i,t}$	4.840	5.586	0.457	-1.192
	(1.68)	(0.98)	(0.29)	(-0.71)
N (domiciles)	44	19	24	24
N (max months)	275	144	275	144
N (domicile-months)	6,798	1619	4,920	3,205
Domicile fixed effects	Yes	Yes	Yes	Yes
Month fixed effects	Yes	Yes	Yes	Yes
Lag control variables	Yes	Yes	Yes	Yes
R^2	21.23%	33.13%	37.55%	43.93%

Table 7, Panel B: Market characteristics and market integration, bond funds

This table reports estimates from the following model:

$$Domicile\ flow_{i,t} = \gamma_0 + \gamma_1 Business\ environment_{i,t} + \gamma_2 Safety\ from\ conflict_{i,t} + \gamma_3 Political\ Stability_{i,t} + \gamma_4 Business\ environment_{i,t} {*} Worldflow_{i,t} + \gamma_5 Safety\ from\ conflict_{i,t} {*} Worldflow_{i,t} + \gamma_6 Political\ Stability_{i,t} {*} Worldflow_{i,t} + \mathbf{Controls_{i,t-1}}\boldsymbol{\psi} + \mathbf{Controls_{i,t-1} {*} Worldflow_{i,t}}\boldsymbol{\phi} + \varepsilon_{i,t}. \quad (11)$$

t-statistics are reported below each coefficient estimate. We require at least 24 months of valid data for a domicile to be included in our sample. Domicile flows are restricted to those from fixed income mutual funds. * significant at 10%; ** significant at 5%; *** significant at 1%.

	All markets, full period	Emerging markets, post-2004	Developed markets, post-2004
$Worldflow_{i,t}$	-2.79359***	-48.4065***	-2.90767***
	(-6.24)	(-6.55)	(-7.17)
$Business\ environment_{i,t}$	-0.01471**	-0.01174	-0.01185
	(-2.21)	(-0.70)	(-1.79)
$Business\ environment_{i,t} {*} Worldflow_{i,t}$	0.096114*	-0.21607	0.432386***
	(1.80)	(-0.92)	(5.90)
$Safety\ from\ conflict_{i,t}$	0.000892	-0.00449	-0.00213
	(0.38)	(-0.38)	(-1.32)
$Safety\ from\ conflict_{i,t} {*} Worldflow_{i,t}$	-0.14568***	-0.19376	-0.0774***
	(-3.66)	(-1.02)	(-2.46)
$Political\ Stability_{i,t}$	-0.00329	-0.01655	-0.00348
	(-0.71)	(-0.76)	(-0.84)
$Political\ Stability_{i,t} {*} Worldflow_{i,t}$	0.03062	0.10172	0.077474*
	(0.80)	(1.23)	(1.83)
$GDPcapital2010_{t-1} {*} Worldflow_{i,t}$	0.060854	-0.03971	0.070077
	(1.33)	(-0.17)	(1.45)
$GDPgrowth_{t-1} {*} Worldflow_{i,t}$	0.187531	0.108983	1.461064**
	(0.15)	(0.01)	(2.02)
$Inflation_{t-1} {*} Worldflow_{i,t}$	0.105679	-8.64049	-0.72399
	(0.04)	(-1.23)	(-0.43)
$Exchange\ rate_{t-1} {*} Worldflow_{i,t}$	3.430543	13.32617*	-0.27353
	(1.39)	(1.93)	(-0.18)
N (domiciles)	31	9	22
N (max months)	192	107	192
N (domicile-months)	3,461	650	2,811
Domicile fixed effects	Yes	Yes	Yes
Month fixed effects	Yes	Yes	Yes
Lagged control variables	Yes	Yes	Yes
R^2	29.44%	35.79%	42.93%

Table 8, Panel A: Regional analysis for Europe and Asia

The table reports average *t*-statistic, beta coefficient, R^2, adjusted R^2 (Panel A) and the proportion of coefficient estimates that are positive or negative (Panel B) for these following return regression models:

$$Domicile\ flow_{i,t} = \alpha_i + \sum_{n=1}^{6} \beta_n\ Top\ domiciles'flows_{i,t-1} + \beta_7\ rest\ of\ Europe\ flows_{t-1} + \beta_8\ US\ flows_{t-1} + \beta_9\ rest\ of\ world\ flow_{t-1} + \varepsilon_{i,t} \quad (12)$$

$$Domicile\ flow_{i,t} = \alpha_i + \sum_{n=1}^{5} \beta_n\ Top\ domiciles'flows_{i,t-1} + \beta_6\ rest\ of\ Asia\ flows_{t-1} + \beta_7\ US\ flows_{t-1} + \beta_8\ rest\ of\ world\ flow_{t-1}\ \varepsilon_{i,t} \quad (13)$$

Column (16) reports statistics from the estimate of equation (16), and column (17) reports statistics from the estimate of equation (17). Each model is run separately for each domicile *i*. The table reports equal-weighted average coefficient estimates and *t*-statistics across domiciles. *N* reports the average number of monthly observations per domicile.

Panel A: Average *t*-statistic, beta coefficient

	(12)		(13)
Average Lux_flow$_{t-1}$	0.224	Average Japan_flow$_{t-1}$	0.187
	(0.52)		(1.01)
Average Irish_flow$_{t-1}$	-0.011	Average India_flow$_{t-1}$	-0.086
	(0.01)		(-0.92)
Average UK_flow$_{t-1}$	-0.144	Average Australia_flow$_{t-1}$	-0.160
	(-0.80)		(-0.67)
Average French_flow$_{t-1}$	-0.059	Average China_flow$_{t-1}$	0.015
	(-0.42)		(0.14)
Average Swiss_flow$_{t-1}$	-0.070	Average Singapore_flow$_{t-1}$	0.332
	(-0.14)		(1.16)
Average German_flow$_{t-1}$	0.114	Average rest_of_Asia_flow$_{t-1}$	0.110
	(0.04)		(0.23)
Average rest_of_Europe_flow$_{t-1}$	0.051	Average US_flow$_{t-1}$	1.191
	(0.26)		(1.06)
Average US_flow$_{t-1}$	0.286	Average rest_of_world_flow$_{t-1}$	-0.339
	(0.56)		(-0.52)
Average rest_of_world_flow$_{t-1}$	-0.018		
	(-0.07)		
R^2	11.61%	R^2	13.12%
Adjusted R^2	2.73%	Adjusted R^2	3.32%
N	122.76	*N*	79.86

Table 8, Panel B: Proportion of coefficient estimates that are positive or negative

	Equation (12): Intra-European relationships			
	Positive beta	Negative beta	Positive significant beta	Negative significant beta
Average Luxembourg_flow$_{t-1}$	64.00%	36.00%	24.00%	8.00%
Average German_flow$_{t-1}$	44.00%	56.00%	16.00%	16.00%
Average Irish_flow$_{t-1}$	44.00%	56.00%	12.00%	4.00%
Average US_flow$_{t-1}$	80.00%	20.00%	8.00%	0.00%
Average UK_flow$_{t-1}$	24.00%	76.00%	4.00%	16.00%
Average French_flow$_{t-1}$	40.00%	60.00%	4.00%	12.00%
Average Swiss_flow$_{t-1}$	48.00%	52.00%	0.00%	4.00%
Average rest_of_Europe_flow$_{t-1}$	68.00%	32.00%	0.00%	0.00%
Average rest_of_world_flow$_{t-1}$	40.00%	60.00%	0.00%	0.00%

	Equation (13): Intra-Asian relationships			
	Positive beta	Negative beta	Positive significant beta	Negative significant beta
Average Singapore_flow$_{t-1}$	85.71%	14.29%	28.57%	0.00%
Average China_flow$_{t-1}$	71.43%	28.57%	14.29%	0.00%
Average US_flow$_{t-1}$	85.71%	14.29%	14.29%	0.00%
Average Japan_flow$_{t-1}$	100.00%	0.00%	0.00%	0.00%
Average India_flow$_{t-1}$	28.57%	71.43%	0.00%	14.29%
Average Australia_flow$_{t-1}$	42.86%	57.14%	0.00%	14.29%
Average rest_of_Asia_flow$_{t-1}$	71.43%	28.57%	0.00%	0.00%
Average rest_of_world_flow$_{t-1}$	28.57%	71.43%	0.00%	14.29%

Table 9, Panel A: Regional analysis for Europe

This table reports coefficient estimates from the following model:

$$Domicile\ flow_{i,t} = \alpha_i + \sum_{n=1}^{6} \beta_n\ Top\ domiciles\ flows_{i,t-1} + \beta_7\ rest\ of\ Europe\ flows_{t-1} + \beta_8\ US\ flows_{t-1} + \beta_9\ rest\ of\ world\ flow_{t-1} + \varepsilon_{i,t} \quad (12)$$

Hetereoskedastic and autocorrelation consistent *t*-statistics are reported in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

	Luxembourg	Ireland	UK	France	Switzerland	Germany	Rest_of_ Europe
Intercept	0.001	0.004***	0.001	0.002	-0.003*	-0.004*	-0.003***
	(0.56)	(3.27)	(0.27)	(0.88)	(-1.68)	(-1.69)	(-8.39)
Lux_flow_{t-1}		0.259**	0.670***	0.568**	-0.162	0.385*	0.589***
		(2.15)	(3.70)	(2.16)	(-0.82)	(1.71)	(14.21)
$Irish\_flow_{t-1}$	-0.013		-0.403***	-0.139	0.075	0.012	-0.140***
	(-0.15)		(-3.11)	(-0.71)	(0.54)	(0.08)	(-4.47)
UK_flow_{t-1}	0.036	0.001		0.063	-0.114	-0.198*	-0.088***
	(0.57)	(0.02)		(0.46)	(-1.17)	(-1.77)	(-4.32)
$French\_flow_{t-1}$	0.054	0.002	-0.067		-0.022	-0.002	0.012
	(1.36)	(0.07)	(-1.11)		(-0.35)	(-0.04)	(0.88)
$Swiss\_flow_{t-1}$	-0.007	0.027	0.067	0.013		0.166*	0.026
	(-0.14)	(0.53)	(0.86)	(0.12)		(1.86)	(1.44)
$German\_flow_{t-1}$	-0.109*	-0.073	-0.153*	-0.313**	-0.032		-0.204***
	(-1.88)	(-1.36)	(-1.85)	(-2.55)	(-0.39)		(-10.00)
$Rest\_of\_Europe\_flow_{t-1}$	0.130**	-0.096	0.009	0.115	0.106	-0.068	
	(2.09)	(-1.51)	(0.10)	(0.80)	(1.04)	(-0.60)	
US_flow_{t-1}	0.307	0.356	0.022	-0.014	0.915**	-0.083	0.060
	(1.24)	(1.55)	(0.07)	(-0.03)	(2.47)	(-0.20)	(0.74)
$Rest\_of\_world\_flow_{t-1}$	-0.011	-0.035	0.056	-0.038	0.022	-0.072	0.007
	(-0.20)	(-0.63)	(0.66)	(-0.31)	(0.25)	(-0.72)	(0.35)
N	218	218	218	218	218	218	4377
R^2	6.35%	4.82%	10.94%	6.74%	5.38%	4.19%	6.07%
Domicile fixed effects	No	No	No	No	No	No	Yes
Month fixed effects	No	No	No	No	No	No	Yes
Adjusted R^2	2.76%	1.18%	7.53%	3.17%	1.76%	0.52%	5.89%

Table 9, Panel B: Regional analysis for Asia-Pacific

This table reports coefficient estimates from the following model:

$$Domicile\ flow_{i,t} = \alpha_i + \sum_{n=1}^{5} \beta_n\ Top\ domiciles'flows_{i,t-1} + \beta_6\ rest\ of\ Asia\ flows_{t-1} + \beta_7\ US\ flows_{t-1} + \beta_8\ rest\ of\ world\ flow_{t-1}\ \varepsilon_{i,t} \quad (13)$$

Hetereoskedastic and autocorrelation consistent *t*-statistics are reported in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

	Japan	India	Australia	China	Singapore	Rest_of_Asia
Intercept	0.001	0.015**	-0.003	-0.005	-0.003	0.001
	(0.22)	(2.47)	(-1.08)	(-0.73)	(-1.66)	(1.49)
$Japan\_flow_{t-1}$		0.121	0.318**	0.124	0.288***	0.191***
		(0.50)	(2.21)	(0.44)	(3.34)	(7.59)
$India\_flow_{t-1}$	-0.074		-0.070	0.066	-0.006	-0.063***
	(-1.28)		(-1.03)	(0.49)	(-0.15)	(-5.26)
$Australia\_flow_{t-1}$	-0.026	0.342		-0.452	-0.045	-0.168***
	(-0.20)	(1.30)		(-1.44)	(-0.48)	(-6.01)
$China\_flow_{t-1}$	0.114**	0.031	0.001		-0.044	0.037***
	(2.25)	(0.31)	(0.01)		(-1.23)	(3.49)
$Singapore\_flow_{t-1}$	0.115	0.393	-0.009	-0.008		0.196***
	(0.72)	(1.26)	(-0.05)	(-0.02)		(5.85)
$Rest\_of\_Asia\_flow_{t-1}$	-0.137	-0.438	0.100	0.078	0.099	
	(-0.82)	(-1.31)	(0.50)	(0.20)	(0.83)	
US_flow_{t-1}	0.056	-4.372***	0.229	0.287	-0.101	0.990***
	(0.08)	(-3.42)	(0.29)	(0.18)	(-0.22)	(7.07)
$Rest\_of\_world\_flow_{t-1}$	0.071	-0.156	-0.361	1.046*	-0.253	-0.043
	(0.26)	(-0.29)	(-1.32)	(1.64)	(-1.32)	(-0.78)
N	80	80	80	80	80	959
R^2	9.45%	18.67%	9.89%	5.36%	16.67%	17.58%
Domicile fixed effects	No	No	No	No	No	Yes
Month fixed effects	No	No	No	No	No	Yes
Adjusted R^2	0.64%	10.76%	1.13%	3.84%	8.56%	16.97%

APPENDICES

ONLINE APPENDIX A

Table A1: List of domiciles across data sources

This table reports list of domiciles in our sample for EPFR, Morningstar (MS), CRSP, and ICI.

	EPFR	MS	CRSP	ICI
A	Australia	Andorra		Argentina
	Austria			Australia
				Austria
B	Bahrain	Bahamas		Belgium
	Belgium			Brazil
	Brazil			Bulgaria
	Bulgaria			
C	Canada	Curacao		Canada
	China	Czechia		Chile
	Columbia			China
				Chinese Taipei
				Costa Rica
				Croatia
				Cyprus
				Czechia
D	Denmark			Denmark
E	Estonia			
F	Finland			Finland
	France			France
G	Germany	Gibraltar		Germany
	Greece	Guernsey		Greece
H	Hong Kong			
	Hungary	Hungary		Hungary
I	India	Isle of man		India
	Indonesia	Italy		Ireland
	Ireland			Italy
	Israel			
	Italy			
J	Japan			Japan
K	Korea	Kuwait		
L	Luxembourg	Liechtenstein		Liechtenstein
				Luxembourg
M	Malaysia	Malta		Malta
	Mexico	Mauritius		Mexico
		Monaco		

N	Netherlands			Netherlands
	New Zealand			New Zealand
	Nigeria			Norway
	Norway			
P	Philippines	Philippines		Pakistan
	Portugal	Portugal		Philippines
				Poland
				Portugal
Q		Qatar		
R	Romania	Russia		Romania
				Russia
S	Singapore	Saudi Arabia		Slovakia
	Slovenia	Slovenia		Slovenia
	South Africa			South Africa
	Spain			South Korea
	Sweden			Spain
	Switzerland			Sweden
				Switzerland
T	Taiwan			Trinidad & Tobago
	Thailand			
	Turkey			Turkey
U	UK	UAE	US	UK
	US	Uganda		US
		US		

ONLINE APPENDIX B

Table B1: Domicile TNA coverage, compared to ICI

This table reports each domicile's TNA, in US dollars, in our sample as of the end of 2018, compared to data from the Investment Company Institute (ICI): (https://www.icifactbook.org/deployedfiles/FactBook/Site%20Properties/pdf/2019/19_fb_table65.pdf). ICI data include regulated open-end funds mutual funds, exchange-traded funds (ETFs), and institutional funds. ETFs are included in Canada beginning in 2017. Beginning in 2014, data from Brazil and European jurisdictions (where applicable) include ETFs. Funds of funds are excluded, except for France, Ireland, Luxembourg, Netherlands, Romania, Spain, and Turkey. Finland, Germany, and Italy exclude funds of funds beginning in 2014, Malta beginning in 2013. For the Netherlands, data between 2011 and 2014 are estimated based upon European Central Bank and IIFA sources.

Domicile	Our data	ICI	% coverage
Philippines	5,582	4,877	114.45%
India	324,159	296,868	109.19%
US	22,452,640	21,077,536	106.52%
Belgium	77,117	96,260	80.11%
Switzerland	418,658	530,976	78.85%
Canada	826,311	1,163,469	71.02%
Luxembourg	3,215,488	4,654,017	69.09%
Sweden	222,622	336,156	66.23%
Ireland	1,615,444	2,772,568	58.27%
UK	941,657	1,682,857	55.96%
Liechtenstein	26,134	50,871	51.37%
Malta	1,452	3,185	45.58%
Japan	734,593	1,804,509	40.71%
Norway	55,787	138,053	40.41%
Finland	38,519	100,005	38.52%
France	633,701	2,074,766	30.54%
Italy	59,898	236,504	25.33%
Romania	1,182	4,726	25.01%
Spain	81,127	324,856	24.97%
Austria	34,650	165,036	21.00%
Taiwan	15,760	78,938	19.97%
Germany	399,706	2,198,505	18.18%
South Africa	26,105	154,995	16.84%
Bulgaria	115	822	14.05%
Australia	192,154	1,946,433	9.87%
Korea	37,444	463,144	8.08%
Chile	3,277	52,497	6.24%
New Zealand	3,169	59,364	5.34%
Denmark	5,072	138,232	3.67%
Greece	169	4,744	3.56%

Domicile	Our data	ICI stat	% coverage
Mexico	3,634	109,729	3.31%
Netherlands	24,697	858,681	2.88%
China	38,617	1,768,597	2.18%
Brazil	3,942	1,211,436	0.33%
Turkey	23	7,407	0.31%

ONLINE APPENDIX C
Table C1: Substitutions for domiciles missing domicile socio-political data

This table reports the source of market-level data for domiciles that lack market-level socio-political data. For one domicile (Mauritius) that lacks country level data from ICRG, equivalent variables are obtained from the Economist Intelligence Unit (EIU) (https://www.eiu.com/n/) by taking the closest matched market (Costa Rica) for an equivalent indicator.

Domicile	Market-level data source
Andorra	Spain
Gibraltar	UK
Guernsey	UK
Jersey	UK
Isle of Man	UK
Liechtenstein	Switzerland
Mauritius	Costa Rica (EIU match)
Monaco	France

ONLINE APPENDIX D
Table D1: Correlations of ICRG variables and principal components.

This table provides Pearson correlation coefficients for the underlying ICRG political, social, and economics measures (listed in the first column) and our three principal components (listed in the first row). *p*-values are given in italics underneath each correlation coefficient.

	Business environment	*Safety from conflict*	*Political stability*
Government stability	0.15247	0.12787	0.73767
	<.0001	*<.0001*	*<.0001*
Socio-economic	0.83538	0.06408	0.2494
	<.0001	*<.0001*	*<.0001*
Investment profile	0.71318	0.14401	0.22742
	<.0001	*<.0001*	*<.0001*
Internal conflict	0.42298	0.71352	0.27665
	<.0001	*<.0001*	*<.0001*
External conflict	0.05928	0.82339	0.03436
	<.0001	*<.0001*	*0.0022*
Corruption	0.78985	0.39696	-0.03789
	<.0001	*<.0001*	*0.0008*
Military in politics	0.52119	0.71199	-0.03527
	<.0001	*<.0001*	*0.0017*
Religious tensions	0.26189	0.63827	0.10276
	<.0001	*<.0001*	*<.0001*
Law and order	0.82153	0.32264	0.0553
	<.0001	*<.0001*	*<.0001*
Ethnic tensions	0.28895	0.28345	0.59308
	<.0001	*<.0001*	*<.0001*
Democracy	0.32329	0.47493	-0.69262
	<.0001	*<.0001*	*<.0001*
Bureaucracy quality	0.80205	0.40486	-0.06136
	<.0001	*<.0001*	*<.0001*

Table D2: Means for ICRG measures and controls, by domicile

domcile	Andorra	Australia	Austria	Bahamas	Belgium	Brazil	Bulgaria	Canada	China	Czechia	Denmark	Estonia	Finland	France
Business environment	-0.48	0.85	0.67	-0.93	0.13	-1.95	-1.11	0.86	-1.13	-0.61	1.14	-0.59	0.61	0.16
Safety from conflict	-0.18	0.17	0.58	1.51	0.57	0.26	0.07	0.43	-2.17	0.74	-0.14	0.09	1.18	-0.43
Political stability	-1.11	-0.61	-0.46	0.74	-0.69	-0.56	-0.05	-0.53	1.34	-0.29	-0.55	-0.53	0.07	-0.68
GDPcapital2010	10.34	10.89	10.76	10.29	10.66	9.34	9.05	10.71	8.85	9.98	10.98	9.76	10.76	10.61
GDPgrowth	1.18%	2.71%	1.56%	1.93%	1.85%	0.68%	3.44%	2.76%	6.95%	2.38%	1.50%	2.89%	0.99%	1.63%
Inflation	0.56%	2.71%	1.77%	4.29%	1.57%	6.47%	3.81%	1.59%	1.98%	1.75%	1.75%	4.29%	1.77%	1.27%
Exchange rate	-0.009%	0.004%	0.000%	-0.014%	0.000%	-0.352%	0.087%	0.019%	0.071%	-0.041%	-0.009%	0.016%	0.015%	0.000%

domicile	Germany	Gibraltar	Greece	Guernsey	Hong Kong	Hungary	India	Indonesia	Ireland	Isle of Man	Israel	Italy	Japan	Israel
Business environment	0.67	0.77	-1.41	0.78	-0.16	-1.04	-0.62	-0.56	0.29	0.78	1.35	-1.18	0.69	1.35
Safety from conflict	0.22	-0.21	0.65	-0.21	-0.10	0.84	-1.80	-2.63	0.84	-0.21	-3.29	0.95	-0.33	-3.29
Political stability	-0.34	-0.84	-0.77	-0.82	1.76	-0.34	-1.66	-0.13	0.26	-0.82	-1.36	-0.36	0.48	-1.36
GDPcapital2010	10.66	10.64	10.05	10.64	10.29	9.53	7.47	8.38	10.84	10.64	10.42	10.46	10.76	10.42
GDPgrowth	1.27%	1.83%	-1.51%	1.86%	3.04%	2.08%	6.57%	5.09%	5.71%	1.86%	3.49%	0.07%	0.97%	3.49%
Inflation	1.32%	1.79%	-0.41%	1.78%	1.11%	2.91%	4.62%	2.83%	2.34%	1.78%	1.41%	1.09%	0.20%	1.41%
Exchange rate	0.000%	0.007%	0.005%	0.006%	-0.023%	-0.255%	0.074%	-0.074%	0.000%	-0.002%	0.101%	0.005%	-0.238%	0.101%

domicile	Luxembourg	Malaysia	Malta	Mauritius	Mexico	Monaco	Netherlands	New Zealand	Nigeria	Norway	Pakistan	Philippines	Portugal	Qatar
Business environment	0.77	-0.45	-0.68	-1.67	-1.68	0.10	0.78	1.11	-2.56	1.17	-0.89	-1.44	-1.03	-0.40
Safety from conflict	0.98	-0.58	1.37	1.24	-0.38	-0.66	0.31	0.30	-2.13	0.26	-3.40	-1.05	0.84	-1.20
Political stability	0.53	0.13	-0.17	0.45	-0.35	-1.62	-0.53	-0.59	-1.10	-0.39	-1.11	-0.28	-0.45	2.78
GDPcapital2010	11.51	9.32	10.13	8.91	9.21	10.65	10.84	10.49	7.79	11.41	7.08	7.92	9.98	11.10
GDPgrowth	3.50%	5.05%	5.93%	4.18%	2.41%	1.30%	1.45%	2.35%	0.94%	1.63%	2.93%	6.34%	-0.79%	4.16%
Inflation	2.45%	1.41%	2.08%	4.04%	4.32%	0.87%	1.51%	2.09%	10.35%	1.83%	6.16%	2.01%	0.90%	-3.29%
Exchange rate	0.000%	-0.131%	-0.010%	0.003%	-0.145%	-0.009%	-0.007%	0.006%	0.180%	-0.195%	0.117%	0.081%	-0.082%	0.252%

domicle	Romania	Russia	Saudi Arabia	Singapore	Slovenia	South Africa	Spain	Sweden	Switzerland	Thailand	Turkey	UAE	UK	USA
Business environment	-2.17	0.10	0.35	1.60	-0.92	-2.19	-0.48	0.84	0.71	-1.25	-0.85	0.05	1.08	0.88
Safety from conflict	0.70	-1.19	-1.10	0.82	-1.30	0.58	-0.18	0.66	0.59	-2.46	-2.67	-0.94	-0.42	-0.51
Political stability	-0.83	-1.06	-0.32	0.72	-1.35	-0.52	-1.11	-0.20	0.23	0.59	-0.39	2.03	-0.31	0.36
GDPcapital2010	9.33	-1.75	-1.18	0.46	0.34	8.92	10.34	10.88	11.18	8.69	9.44	10.57	10.57	10.78
GDPgrowth	5.11%	-2.22	-1.37	0.26	0.51	1.51%	1.16%	2.01%	1.90%	2.98%	4.58%	3.74%	2.09%	2.45%
Inflation	5.14%	-2.07	-0.89	0.44	-0.46	5.45%	0.56%	1.78%	0.41%	1.54%	9.09%	0.51%	1.93%	1.88%
Exchange rate	-0.007%	-1.11	-0.23	0.07	0.23	-0.218%	0.005%	-0.099%	0.001%	0.115%	-0.221%	0.000%	0.001%	0.048%

ONLINE APPENDIX E

This Appendix reports value-weighted (by lagged TNA) mean estimates for equations (2) through (9). One advantage of a VW measurement is that it is standardized over our sample: monthly observations for world flow are the same across domiciles. The disadvantage of this method is that flows from large domiciles (US, UK, etc.) and specialized financial centers (i.e., Luxembourg and Ireland) tend to dominate flows from smaller domiciles. This is reflected in our result using these variables. Our results are stronger and more significant using world flow as value-weighted by TNA from every domicile without US flow and strongest and most significant using world flow as value-weighted by TNA from every domicile including US flow.

Table E1: Domicile-level return analysis

The table reports average *t*-statistics, beta coefficient, R^2, adjusted R^2 (Panel A) and the proportion of coefficient estimates that are positive or negative (Panel B) for these following return regression models:

$$Domicile\ return_{i,t} = \alpha_i + \beta_i\ US\ return_{i,t} + \varepsilon_{i,t} \quad (2)$$
$$Domicile\ return_{i,t} = \alpha_i + \beta_i\ US\ return_{i,t-1} + \varepsilon_{i,t} \quad (3)$$
$$Domicile\ return_{i,t} = \alpha_i + \beta_{1i}\ US\ return_{i,t} + \beta_{2i}\ US\ return_{i,t-1} + \varepsilon_{i,t.} \quad (4)$$
$$Domicile\ return_{i,t} = \alpha i + \beta i\ World\ return_{i,t} + \varepsilon_{i,t,} \quad (5)$$

With i = 1 to 63, excluding the US. Column (2) reports statistics from the estimate of equation (2), column (3) reports statistics from the estimate of equation (3), columns (4a) and (4b) report statistics from the estimate of equation (4), and column (5) reports statistics from the estimate of equation (5). Each model is run separately for each domicile *i*. The table reports value-weighted average coefficient estimates and *t*-statistics across domiciles, the proportion of coefficient estimates that are positive or negative, and significant or insignificant at the 95% level. *N* reports the average number of monthly observations across domiciles.

Panel A: Average *t*-statistic, beta coefficient

	(2)	(3)	(4)		(5)
			(a)	(b)	
	Average β_i	**Average β_i**	**Average β_{1i}**	**Average β_{2i}**	**Average β_i**
Average coefficient estimate	1.062	0.179	1.066	0.145	0.930
Average *t*-statistic	8.07	1.30	8.15	1.26	23.05
R^2	33.33%	1.22%	34.30%		64.21%
Adjusted R^2	32.96%	0.72%	33.56%		63.96%
N	237.39	236.39	236.39		237.39

Panel B: Proportion of coefficient estimates that are positive or negative

	Proportion	**Proportion**	**Proportion**		**Proportion**
Positive beta	93.32%	94.77%	93.32%	89.58%	99.49%
Negative beta	6.68%	5.23%	6.68%	10.42%	0.51%
Positive significant beta	89.19%	15.78%	89.19%	15.70%	98.77%
Negative significant beta	0.62%	0.15%	0.54%	0.15%	0.02%

Table E2: Domicile-level contemporaneous flow analysis

The table reports average *t*-statistic, beta coefficient, R^2, adjusted R^2 (Panel A) and the proportion of coefficient estimates that are positive or negative (Panel B) for these following return regression models:

$$Domicile\ flow_{i,t} = \alpha_i + \beta_i\ World\ flow_{i,t} + \varepsilon_{i,t} \quad (6)$$

$$Domicile\ flow_{i,t} = \alpha_i + \beta_i\ US\ flow_{i,t} + \varepsilon_{i,t} \quad (7)$$

$$Domicile\ flow_{i,t} = \alpha_i + \beta_{1i}\ World\ flow_{i,t} + \beta_{2i}\ \varepsilon_{US\ flow\ i,t} + \varepsilon_{i,t} \quad (9)$$

With i = 1 to 63, excluding US. Column (6) reports statistics from the estimate of equation (6), column (7) reports statistics from the estimate of equation (7), and columns (9a) and (9b) report statistics from the estimate of equation (9). Each model is run separately for each domicile *i*. The table reports value weighted average coefficient estimates and *t*-statistics across domiciles, the proportion of coefficient estimates that are positive or negative, and significant or insignificant at the 95% level. *N* reports the average number of monthly observations across domiciles.

Panel A: Average *t*-statistic, beta coefficient

			(9)	
	(6)	**(7)**	**(a)**	**(b)**
	Average β_i	**Average β_i**	**Average β_{1i}**	**Average β_{2i}**
Average coefficient estimate	0.771	0.159	0.771	-0.020
Average *t*-statistic	8.74	0.73	8.90	0.37
R^2	27.68%	1.32%	28.85%	
Adjusted R^2	27.29%	0.82%	28.08%	
N	237.39	237.39	237.39	

Panel B: Proportion of coefficient estimates that are positive or negative

	Proportion	**Proportion**	**Proportion**	
Positive beta	98.31%	64.27%	98.31%	57.12%
Negative beta	1.69%	35.73%	1.69%	42.88%
Positive significant beta	88.64%	31.36%	88.64%	0.31%
Negative significant beta	0.02%	0.00%	0.02%	0.23%

ONLINE APPENDIX F

This Appendix reports estimates from equations (6) and (7) by domicile.

Table F1 reports domicile beta, *t*-statistics from our flow analysis equation (6):

$$Domicile\ flow_{i,t} = \alpha_i + \beta_i\ World\ flow_{i,t} + \varepsilon_{i,t} \qquad (6)$$

with i = 1 to 63. All returns, flows, and TNA are converted to US dollars if not already reported in US dollars. N reports the number of monthly observations across domiciles. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table F1: Equation (6) estimates, by domicile

#	Domicile	β_i	*t*-statistic
1	Andorra	0.218	(0.78)
2	Australia	1.604***	(10.49)
3	Austria	1.754***	(12.91)
4	Bahamas	-0.382	(-1.07)
5	Bahrain	0.275	(1.38)
6	Belgium	1.259***	(8.86)
7	Brazil	1.559***	(4.86)
8	Bulgaria	1.622***	(6.20)
9	Canada	0.730***	(6.89)
10	Chile	2.145**	(2.09)
11	China	-0.658	(-1.01)
12	Columbia	1.960***	(6.93)
13	Czechia	-0.243**	(-2.03)
14	Denmark	1.378***	(11.07)
15	Estonia	2.043***	(4.62)
16	Finland	2.179***	(4.73)
17	France	1.317***	(9.80)
18	Germany	1.277***	(13.08)
19	Gibraltar	-0.228	(-0.68)
20	Greece	2.043***	(9.48)
21	Guernsey	-0.128	(-1.05)
22	Hong Kong	-0.028	(-0.18)
23	Hungary	0.662**	(2.32)
24	India	0.747**	(2.24)
25	Indonesia	8.471	(0.96)
26	Ireland	0.603***	(6.82)
27	Isle of Man	-0.268	(-0.46)
28	Israel	0.718***	(4.48)
29	Italy	0.532***	(4.44)

30	Japan	0.123	(0.40)
31	Korea	1.066***	(3.62)
32	Kuwait	0.205	(1.59)
33	Liechtenstein	0.552***	(2.91)
34	Luxembourg	0.741***	(15.34)
35	Malaysia	0.836**	(2.25)
36	Malta	0.156	(0.67)
37	Mauritius	0.211**	(2.07)
38	Mexico	1.117**	(2.55)
39	Monaco	0.184	(1.30)
40	Netherlands	1.051***	(7.14)
41	New Zealand	1.530***	(12.14)
42	Nigeria	-0.255	(-0.84)
43	Norway	1.896***	(12.54)
44	Pakistan	0.212	(0.20)
45	Philippines	-0.071	(-0.30)
46	Poland	0.801	(0.71)
47	Portugal	0.097	(1.75)
48	Qatar	0.501	(1.08)
49	Romania	1.355***	(11.65)
50	Russia	0.555***	(2.75)
51	Saudi Arabia	0.152	(0.67)
52	Singapore	0.419***	(4.76)
53	Slovenia	0.280**	(2.17)
54	South Africa	1.739***	(9.35)
55	Spain	1.279***	(8.75)
56	Sweden	1.979***	(9.86)
57	Switzerland	0.642***	(5.89)
58	Taiwan	0.601	(1.26)
59	Thailand	0.538**	(2.31)
60	Turkey	1.127***	(2.83)
61	UAE	0.346**	(2.48)
62	UK	0.736***	(7.57)
63	USA	0.023	(1.53)

Table F2: Equation (7) estimates, by domicile

Table F2 reports domicile beta, *t*-statistics from our flow analysis equation (7):

$$Domicile\ flow_{i,t} = \alpha_i + \beta_i\ US\ flow_{i,t} + \varepsilon_{i,t} \quad (7)$$

with i = 1 to 63. All returns, flows, and TNA are converted to US dollars if not already reported in US dollars. N reports the number of monthly observations across domiciles. Domiciles are sorted by $\boldsymbol{\beta_i}$. * significant at 10%; ** significant at 5%; *** significant at 1%.

Domicile	β_i	*t*-statistic
Isle of man	-5.512	(-1.22)
Poland	-3.278***	(-6.68)
Japan	-2.230*	(-1.70)
Nigeria	-1.565	(-0.98)
Hong Kong	-1.542*	(-1.72)
Columbia	-1.136	(-1.55)
Estonia	-0.930	(-1.03)
Bahamas	-0.834	(-0.94)
Andorra	-0.787*	(-1.76)
Malta	-0.770	(-1.14)
Bahrain	-0.642	(-0.46)
Saudi Arabia	-0.634	(-0.59)
Qatar	-0.630	(-0.59)
Malaysia	-0.622	(-0.55)
Gibraltar	-0.550	(-0.96)
Chile	-0.524	(-0.73)
Thailand	-0.475	(-0.44)
France	-0.419	(-0.95)
Liechtenstein	-0.409	(-0.70)
Guernsey	-0.393	(-0.84)
Mexico	-0.361	(-0.25)
Philippines	-0.331	(-0.37)
Slovenia	-0.235	(-0.61)
Russia	-0.206	(-0.38)
Mauritius	-0.201	(-0.47)
Brazil	-0.145	(-0.12)
Canada	-0.104	(-0.44)
Denmark	-0.093	(-0.22)
UK	-0.026	(-0.10)
New Zealand	0.021	(0.02)
Spain	0.084	(0.18)

Switzerland	0.095	(0.29)
Kuwait	0.106	(0.24)
Belgium	0.231	(0.55)
Ireland	0.300	(0.92)
Austria	0.311	(0.68)
Pakistan	0.320	(0.25)
Italy	0.322	(1.17)
Bulgaria	0.328	(0.90)
Israel	0.335	(0.45)
Singapore	0.343	(1.02)
Romania	0.350	(0.92)
Finland	0.382	(0.42)
Monaco	0.414	(1.01)
Netherlands	0.467	(1.20)
Portugal	0.484	(0.88)
Taiwan	0.496	(0.24)
UAE	0.531	(1.08)
Germany	0.548	(1.00)
Luxembourg	0.558**	(2.23)
Czechia	0.626*	(1.61)
Turkey	0.658	(0.45)
Greece	0.784	(0.62)
Norway	0.920	(0.96)
Hungary	1.000	(0.49)
Australia	1.044	(1.46)
Korea	1.079	(0.89)
China	1.094	(1.30)
South Africa	1.179	(0.97)
India	2.270**	(2.32)
Sweden	2.381*	(1.89)
Indonesia	9.883	(0.68)

ONLINE APPENDIX G

This appendix reports the results of models that incorporate a wide range of corrections for lagged flows. We report estimates for models of domicile flow and lagged world flow (equation 12), lagged US flow (equation 13), a two two-factor equation that includes both current flow and lagged flow for US flow (equation 14), and world flow (equation 15):

$$Domicile\ flow_{i,t} = \alpha_i + \beta_i\ World\ flow_{i,t-1} + \varepsilon_{i,t}. \tag{G1}$$

$$Domicile\ flow_{i,t} = \alpha_i + \beta_i\ US\ flow_{i,t-1} + \varepsilon_{i,t}. \tag{G2}$$

$$Domicile\ flow_{i,t} = \alpha_i + \beta_{1i}\ US\ flow_{i,t} + \beta_{2i}\ US\ flow_{i,t-1} + \varepsilon_{i,t}. \tag{G3}$$

$$Domicile\ flow_{i,t} = \alpha_i + \beta_{1i}\ World\ flow_{i,t} + \beta_{2i}\ World\ flow_{i,t-1} + \varepsilon_{i,t}. \tag{G4}$$

We report our results of equations (G1) through (G4) in Table G1.

One key assumption of the OLS models reported in the text is that the errors are independent. However, with our time series data for each domicile, the OLS regression residuals are possibly correlated over time. Table G2 reports estimates from a vector-auto regression (VAR) analysis with one-month lags, of equations (G3) and (G4). The VAR results are comparable to those reported in the text. Because VAR adjustments do not change the results in a meaningful way, we do not include VAR adjustments to the estimates reported in the text. In untabulated tests, we estimate VAR models with three-month, six-month, and 1-year lags but the estimations do not converge under these specifications.

Table G1: Domicile-by-domicile lagged flow analysis

The table reports average *t*-statistic, beta coefficient, R^2, adjusted R^2 (Panel A) and the proportion of coefficient estimates that are positive or negative (Panel B) for the following regression models:

$$Domicile\ flow_{i,t} = \alpha_i + \beta_i\ World\ flow_{i,t-1} + \varepsilon_{i,t} \quad (G1)$$
$$Domicile\ flow_{i,t} = \alpha_i + \beta_i\ US\ flow_{i,t-1} + \varepsilon_{i,t} \quad (G2)$$
$$Domicile\ flow_{i,t} = \alpha_i + \beta_{1i}\ US\ flow_{i,t} + \beta_{2i}\ US\ flow_{i,t-1} + \varepsilon_{i,t} \quad (G3)$$
$$Domicile\ flow_{i,t} = \alpha_i + \beta_{1i}\ World\ flow_{i,t} + \beta_{2i}\ World\ flow_{i,t-1} + \varepsilon_{i,t} \quad (G4)$$

Each model is run separately for each domicile *i*. The table reports equal-weighted average coefficient estimates and *t*-statistic across domiciles, the proportion of coefficient estimates that are positive or negative, and significant or insignificant at the 95% level. *N* reports the average number of monthly observations across domiciles. There are 62 domiciles with sufficient data to compute estimates, excluding the US.

Panel A: Average *t*-statistic, beta coefficient

			(G3)		(G4)	
	(G1)	(G2)	(a)	(b)	(a)	(b)
	Average β_i	Average β_i	Average β_{1i}	Average β_{2i}	Average β_{1i}	Average β_{2i}
Average coefficient estimate	0.050	0.021	0.049	0.016	0.950	0.019
Average *t*-statistic	0.27	0.13	0.04	0.07	4.32	0.08
R^2	1.90%	1.62%	4.25%		18.79%	
Adjusted R^2	0.58%	0.28%	1.56%		16.37%	
N	142.03	142.03	142.03		142.03	

Panel B: Proportion of coefficient estimates that are positive or negative

	Proportion	Proportion	Proportion		Proportion	
Positive beta	55.56%	65.08%	52.38%	60.32%	85.71%	57.14%
Negative beta	44.44%	34.92%	47.62%	39.68%	14.29%	42.86%
Positive significant beta	6.35%	4.76%	3.17%	3.17%	60.32%	4.76%
Negative significant beta	9.52%	4.76%	1.59%	6.35%	0.00%	11.11%

Table G2: Vector auto-regression estimation results

This table reports estimates from a vector autoregression (VAR) analysis with one-month lag for equations (G3) and (G4). Each model is run separately for each domicile *i*. The table reports equal-weighted average coefficient estimates and *t*-statistic across domiciles, the proportion of coefficient estimates that are positive or negative, and significant of insignificant at the 95% level. There are 61 domiciles with sufficient data to compute estimates, excluding the US.

	(G3)	**(G4)**
	Average β_{1i}	**Average β_{1i}**
Average coefficient estimate	-0.194	0.341
Average *t*-statistic	-0.01	1.52
	Proportion	**Proportion**
Positive beta	45.16%	70.97%
Negative beta	54.84%	29.03%
Positive significant beta	6.45%	30.65%
Negative significant beta	4.84%	4.84%

ONLINE APPENDIX H

Table H1: Analysis of offshore centers

The table reports average *t*-statistic, beta coefficient, R^2, adjusted R^2 (Panel A) and the proportion of coefficient estimates that are positive or negative (Panel B) for these following return regression model:

$$Domicile\ flow_{i,t} = \alpha_i + \beta_i\ World\ flow_{i,t} + \varepsilon_{i,t.} \quad (6)$$

Column (1) reports statistics from the estimate of equation (6) with a subsample for offshore financial centers (Andorra, the Bahamas, Gibraltar, Guernsey, Hong Kong, the Isle of Man, Liechtenstein, Malta, Mauritius, and Monaco), column (2) reports statistics from the estimate of equation (6) with the full sample without offshores financial centers, Luxembourg, and Ireland. Each model is run separately for each domicile *i*. The table reports equally weighted average coefficient estimates and *t*-statistics across domicile, the proportion of coefficient estimates that are positive or negative, and significant or insignificant at the 95%. *N* reports the average number of monthly observations across domiciles.

Panel A: Average *t*-statistic, beta coefficient

	(1)	(2)
	Average β_i	**Average β_i**
Average coefficient estimate	0.043	1.047
Average *t*-statistic	0.38	4.83
R^2	1.80%	18.76%
Adjusted R^2	0.98%	17.71%
N (average months)	139.43	151.93

Panel B: Proportion of coefficient estimates that are positive or negative

	Proportion	Proportion
Positive beta	42.86%	88.89%
Negative beta	57.14%	11.11%
Positive significant beta	14.29%	73.33%
Negative significant beta	0.00%	2.22%

Table H2: Market integration, offshore centers

This table reports estimates from the following model:

$$Domicile\ flow_{i,t} = \gamma_0 + \gamma_1 Business\ environment_{i,t} + \gamma_2 Safety\ from\ conflict_{i,t} + \gamma_3 Political\ Stability_{i,t}$$
$$+ \gamma_4 Business\ environment_{i,t} {*} Worldflow_{i,t} + \gamma_5 Safety\ from\ conflict_{i,t} {*} Worldflow_{i,t}$$
$$+ \gamma_6 Political\ Stability_{i,t} {*} Worldflow_{i,t} + \boldsymbol{Controls_{i,t-1}\psi} + \boldsymbol{Controls_{i,t-1} {*} Worldflow_{i,t}\phi} + \varepsilon_{i,t} \quad (11)$$

Column (1) reports statistics from the estimate of equation (11) with the subsample for offshore centers (Andorra, Bahamas, Gibraltar, Guernsey, Hong Kong, Isle of Man, Liechtenstein, Malta, Mauritius, and Monaco). Column (2) reports statistics from the estimate of equation (11) with the full sample without offshore centers, Luxembourg, and Ireland. The sample periods for both are post-1997 due to data availability. *t*-statistics are reported below each coefficient estimate. We require at least 24 months of valid data for a domicile to be included in our sample. * significant at 10%; ** significant at 5%; *** significant at 1%.

	(1)	(2)
$Worldflow_{i,t}$	-174.99***	-8.84644***
	(-11.78)	(-13.39)
$Business\ environment_{i,t}$	-0.0051	-0.0052
	(-0.57)	(-1.22)
$Business\ environment_{i,t} {*} Worldflow_{i,t}$	0.17028	0.09789***
	(1.91)	(2.25)
$Safety\ from\ conflict_{i,t}$	-0.00239	-0.00178
	(-0.31)	(-0.58)
$Safety\ from\ conflict_{i,t} {*} Worldflow_{i,t}$	0.02931	0.17408
	(0.32)	(2.29)
$Political\ Stability_{i,t}$	-0.0031	0.003755
	(-0.76)	(1.81)
$Political\ Stability_{i,t} {*} Worldflow_{i,t}$	0.21996***	-0.19236***
	(3.64)	(-5.44)
$GDPcapital2010_{t-1} {*} Worldflow_{i,t}$	-0.043	0.006
	(-1.88)	(0.16)
$GDPgrowth_{t-1} {*} Worldflow_{i,t}$	-0.238	-0.801
	(-0.11)	(-0.46)
$Inflation_{t-1} {*} Worldflow_{i,t}$	-0.359	2.258
	(-0.11)	(1.52)
$Exchange\ rate_{t-1} {*} Worldflow_{i,t}$	-1.762	0.354
	(-0.41)	(0.19)
N (domiciles)	10	39
N (max months)	275	275
N (domicile-months)	1,501	5,480
Domicile fixed effects	Yes	Yes
Month fixed effects	Yes	Yes
R^2	71.17%	27.65%

CHAPTER 2

Contagion in the market for asset management:

Evidence from global mutual fund flows

Abstract

We examine the evolution of contagion over time and across conditions in the market for asset management. First, we examine the time trend in cross-domicile mutual fund flow correlations during recent decades. Second, we model contagion in fund flows during different conditions of market stress. Last, we investigate changes in cross-domicile flow correlations during and after the financial crisis of 2006-2008. Results indicate that there was a peak in market contagion during the financial crisis period, and correlations decreased in the following periods.

1. Introduction

This study follows the first essay of my dissertation (Nguyen, 2022) by extending the scope of knowledge about international mutual fund (MF) flows. In particular, we seek to identify whether international domicile[5] MF flows follow similar patterns over time compared to international equity returns and how MF flow correlations vary with market conditions. As summarized in the literature review below, cross-country stock return correlations are known to increase over time and during periods of crisis. We examine if these two patterns also apply to cross-domicile MF flow correlations.

There are several reasons why it is essential to understand the patterns of cross- domicile MF flows and how these patterns evolve over time. First, international equity markets of different sizes, structures, and geographic locations often display an increased degree of correlation after a shock to one market. We are interested if this is also true in the international market for asset management. However, statistical tests during periods of increased volatility are often miss-specified. Forbes and Rigobon (2002) raise this concern in their analysis for stock market comovement. They find that correlation coefficients are conditional on market volatility, and after adjusting for this bias, they conclude that there was no contagion during the 1997 Asian crisis, 1994 Mexican devaluation, and 1987 US market crash. We use MF flow data as an alternative measure to evaluate the evolution of market integration and segmentation over time.

Second, understanding the dynamic nature of international portfolio flows, in general, and MF flow, in particular, helps investors and regulators to predict the boom-bust cycle of local asset

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[5] MF flow data are tagged with the legal domicile of each MF. These domiciles do not necessarily align with "countries" as reported in other databases or the published literature. When we use domicile-level MF flow data we will refer to "domiciles". When we refer to variables classified at the country level, we will refer to "countries". When we refer to variables or concepts that could apply at either level or are unclear, we will refer to "markets". For example, Jersey, Guernsey, Gibraltar, and the Isle of Man report fund flows as separate domiciles from the UK but may be aggregated with the UK in market or country level data.

prices and thereby manage the spread of financial contagion across markets. For example, Claessens, Dooley, and Warner (1995) study the volatility of short-term and long-term capital flows and find that long-term flows are at least as unpredictable as short-term flows. Levchenko and Mauro (2007) show that during "sudden stops," portfolio equity flows are volatile while portfolio debt flows experience a reversal, and other flows (including bank loans and trade credit) experience severe drops and often remain depressed for years.

Third, it is interesting to use MF flow as a channel to study differences in the degree of market efficiency among countries (developed and emerging). As implied from the theoretical work by Berk and Green (2004), MF investors may recognize fund manager skills and direct MF flows to the most productive funds in an efficiently functioning market for asset management. Broner, Gelos, and Reinhart (2006) carry out empirical testing of emerging market MFs and the role they play in the transmission of shocks across countries. They find that when funds' returns are below average, they reduce their exposure to countries in which they were overweight and vice versa. Using portfolio flows between more-developed and less-developed countries, Ferreira and Laux (2009) show that both inflow and outflows of a country's funds are predictive of GDP growth, but the effect of inflows is strong for less-developed countries. Our work can be used to evaluate how efficiently money and information flow between investors and asset managers both within and across countries.

Our research has several results. First, we confirm an increase in MF flow correlation levels during the 2006-2010 financial crisis period. Second, in contrast to existing work on equity returns, we find the surprising result that cross- domicile MF correlations decrease in the decade after the financial crisis. A quantile regression approach shows that the effect of the time trend is more robust for domicile -month observations with higher flow. Last, we observe a negative relationship between sensitivity to extreme global MF flow and a market's safety from conflict, but not for the market's business environment and political stability. To the best of our knowledge, we are the first to study international MF flow correlation over time using a worldwide sample of funds and countries.

The remainder of the article is organized as follows. The second section introduces our hypotheses and literature review of market segmentation over time. In section three, we describe our data sources and sample construction. Section four presents our models with different specifications. Section five shows the results. Section six concludes the findings.

2. Related literature and hypothesis development

When research examines return correlations across countries, notable recent study has looked at how these correlations evolve over time. Bekaert et al. (2009) show evidence of an upward trend over time in country return correlations in Europe and a weak upward trend in the correlations between the US and European countries. Later work by Bekaert et al. (2011) model world market segmentation using the US corporate credit spreads, along with two local country factors: political risk profile and stock market development. They find that overall, the segmentation (i.e., lack of correlation) level has decreased (i.e., correlations have increased) in developed countries, while segmentation remains significant in emerging markets. Bekaert and Harvey (1995), De Jong and De Roon (2005), Volosovych (2011), and Carrieri et al. (2007) further analyze time variation in world market integration and find an increase in the number of emerging markets exhibiting time-varying integration, but other markets still appear segmented (there are substantial cross-market differences in the degree of integration). Pukthuanthong and Roll (2009) offer a methodological improvement in measuring global market integration based on the explanatory power of a multi-factor model: they regress dollar-denominated daily market index returns on the derived global factors each year.

It is essential to separate levels of contagion at different time periods, according to Rigobon (2019). He argues that unlike spillovers, which are always present, contagion tends to be more significant during crisis episodes or periods of distress. He splits the empirical problem into (1) normal times (which could or could not be contagious) and (2) periods after a certain macroeconomic event (shift contagion). In addition, to study what drivers of shocks across countries[6], Rigobon (2019) raises the necessity to look at levels of cross-country correlation. On the other hand, using a large database of four asset classes (equities, government bonds, investment-grade corporate bonds, and high-yield corporate bonds) in four geographic zones (US, Eurozone, UK, and Japan), Briere et al. (2012) look at the evolution of globalization over time and how it drives market integration, and find no evidence of contagion. They confirm the presence of globalization and suggest that the tendency towards a flight to quality dictates during crisis periods because the bond market is not greatly affected.

Of the papers cited above, we most directly attribute portions of our procedures to the work of Pukthuanthong and Roll (2009), Carrieri et al. (2007), and Rapach et al. (2013). Rapach et al. (2013) guide our procedure to include lagged analysis in order to measure the influence of US mutual fund flows on other countries' fund flows. Pukthuanthong and Roll (2009) demonstrate that simple correlations may be misleading in characterizing market integration. We, therefore, follow their guidance in later stages of our analysis that move beyond simple correlation measures, even though their measures require modification to be applicable in our setting. We adopt a

[6] Rigobon (2019) summarizes two interesting features of cross-country study: (1) transmission from large countries to smaller countries, (2) most of the countries affected by the shocks had strong trade relationships with the country where the crisis started.

modified procedure from Carrieri et al. (2007) to examine if cross-domicile flow correlations increase or decrease over our sample period.

In the main analysis of this paper, we look into the interaction between domicile flows and the world flows across different periods. The literature on the evolution of stock return and market integration provides mixed results. Baig and Goldfajn (1999) find that correlations in currency and sovereign spreads increased significantly during the 1997 Asian crisis period, whereas the equity market correlations offer mixed evidence. Longin and Solnik (1995, 2001) confirm an increase in the international correlation between markets over 30 years of their sample from 1960 to 1990. However, when it comes to the times of financial crisis, all of the findings agree on the increasing level of correlation during times of turmoil: the 1987 stock market crash (King and Wadhwani, 1990; Liu et al., 1998; Longin and Solnik, 1995); the 1994 Mexican peso crisis (Calvo and Reinhart, 1996); the 1997 Asian currency crisis (Baig and Goldfajn, 1999); the 1994 Mexican peso crisis, 1997 Asian crisis, and 1998 Russian crisis (Bae et al., 2003; Forbes and Rigobon, 2001 and 2002). Except for Edwards and Zhang (1998), who find an increased level of correlation in bond markets after the 1994 Peso crisis, none of those papers explicitly test if the transmission changes significantly after the relevant crisis.

The existing literature on cross-country return correlations over time provides us with two hypotheses to judge the changing patterns in market integration. First, we study the extent to which flow correlations are increasing among countries over time:

$H1_A$: Market integration increases over time.

Hypothesis 1 allows us to confirm if fund flows correlations remain significant and increase over time, as is the case for stock return correlations.

Then, we confirm whether the previously documented increasing level of correlations between countries for stock returns during crises also applies to our sample of MF flows:

$H2_A$: Contagion exists in the market for asset management, i.e., cross-domicile flow associations increase during times of financial crisis.

Hypothesis 2 allows us to test if the previously documented evidence of the increasing correlations between countries for stock returns extends to our data on MF flow, our sample period, our sample of countries, and our measures of the aggregate world and the US returns. Brier et al. (2012) test the equality of correlation matrices using the GLR (2005) test and the correlation differences between two periods (2004 to 2010 and 1998 to 2004). They found support for market integration in the equity, government bond, and high-yield corporate bond but not in the investment-grade corporate bond.

Finally, we study the effect of different markets' socio-political conditions on contagion.

$H3_A$: Contagion is stronger for markets with negative socio-political conditions.

Hypothesis 3 allows us to examine MF flow contagion among markets with specific conditions. Bekaert et al. (2014) study the transmission of the 2007 to 2009 financial crisis to 55 equity markets, and they find small effects of contagion from the US to equity markets globally. In addition, they find that portfolios in countries with weak economic fundamentals, poor sovereign ratings, and high fiscal and current account deficits experienced more contagion, both from the U.S. and from the domestic market while the introduction of debt guarantees, a good government budget position, or strong political stability (proxied by ICRG variables) would have eliminated about half of the domestic contagion effect during the crisis. Other studies in equity markets have come to similar findings at the international level: Asongu (2011) and Chau et al. (2014) for Africa; Frijins et al. (2012), and Luchtenberg and Vu (2015) for Europe and Asia. As for MF literature, using a similar dataset (EPFR) like us, Puy (2016) studies the dynamics and geography of investments made by international mutual funds located in developed markets and finds strong evidence of global contagion. He measured political instability by the political risk rating (index computed by ICRG) and conclude that political instability increases the sensitivity to contagion.

3. Data and model development

3.1.MF flow and return measures.

The primary data source for fund flow data is EPFR, from which we obtain fund-level TNA and flows. The EPFR dataset has several unique advantages relative to CRSP and Morningstar: First, it reports higher frequency fund flows (monthly rather than quarterly, which is available for several countries in Morningstar); Second, EPFR has been previously validated as a reliable data source for country-level flows by Jotikasthira et al. (2012), who show that there are only minor differences between EPFR and CRSP when they compare TNA and monthly return of the subsample of EPFR funds to CRSP mutual fund data. Jinjarak et al. (2011) and Li et al. (2018) point out additional advantages of the EPFR database, including long periods of data availability and the coverage of both international bond and equity investments by global funds. Other studies that have used the EPFR database include Fratzcher (2012), Raddatz and Schmukler (2012), Puy (2016), and Li et al. (2018). Third, EPFR allows for a clear decomposition of flows into local currency changes in fund TNAs and US dollar changes in TNA due to exchange rate changes. Unless otherwise indicated, we compute domicile flows as the local currency percentage fund flows each month in each market. We require a market to have at least two funds to be included in the sample. The fund level EPFR data cover 1,169,448 fund-month observations from 21,023 funds over 24 years. We can aggregate the fund-level EPFR data to 63 distinct domiciles.

Our second dataset is manually collected from Morningstar for open-end funds from 1996 to 2019, with coverage of around 370,000 global funds domiciled in 82 countries, excluding the US. Appendix A provides additional details on the sample construction procedure. We collect data on monthly TNA, returns, and other fund characteristics, such as fees and expenses. Due to legal, accounting, and data coverage details, many variables are not exactly comparable from one country to another.[7] Appendix B summarizes the subnational domiciles in our sample, as well as offshore financial centers, and reports robustness tests concerning how these observations are treated. We standardize the data to the extent possible and only retain those variables and countries that we judge to be reasonably comparable in terms of variable construction. When not reported directly, monthly returns are calculated by taking the change in monthly net asset values (NAVs), reinvesting all income and capital-gains distributions during that month, and dividing by the starting NAV. Reinvestments are made using the actual reinvestment NAV, and daily payoffs are reinvested monthly. Morningstar does not adjust total returns for sales charges (such as front-end loads, deferred loads, and redemption fees), preferably to give a clearer picture of a fund's performance. The total returns account for management, administrative, 12b-1 fees, and other costs taken out of fund assets.

We retain observations with TNA greater than zero. This leaves us with 68 countries covering about 137,000 funds. Morningstar coverage of TNA is generally much better than reporting for returns, NAV, or distributions. After filtering by non-missing returns, we have

[7] Unless otherwise indicated, henceforth, we use the terms "country" and "market" interchangeably with the term "domiciles." Our fund flow data are at the domicile level. In domicile-level fund flows data, sub-national domiciles are treated as separate countries (i.e., Jersey, Guernsey, Gibraltar, Monaco, etc.). In country level analysis, some subnational domiciles do not report separate country-level data (i.e., Jersey and Guernsey), while others do report distinct country-level data (i.e., Hong Kong is reported separately from China). In general, if a domicile reports distinct data then we treat it as a "country". When it does not report distinct data then it is excluded from the country level analysis. Appendix C reports the robustness of our main results with sub-national domiciles excluded.

177,418 fund-month observations from 3,229 funds from 24 countries in the Morningstar data. Corresponding data for the US are from the CRSP Survivor-Bias-Free US Mutual Fund Database, with standard filters to keep valid, non-missing TNA, return, and fund identifier variables.

Since both Morningstar and CRSP provide monthly returns and monthly TNA only, we calculate the monthly flow, $Flow_t$, as is standard in the literature about MF flows (i.e., Sirri and Tufano, 1998):

$$Flow_t = TNA_t - TNA_{t-1} * (1 + r_t). \quad (1)$$

For both datasets, we aggregate TNA, returns, and flows across classes when there are multi-share classes of a fund. We then average flows across funds, weighted by TNA, for each domicile - month in order to get the domicile level aggregate flow, *Domicile* $flow_{i,t}$. When fund flows are reported quarterly, we distribute these quarterly flows evenly over the three months of the quarter before aggregating at the domicile level.

Our domicile level flow and aggregation methods are designed to capture births and deaths of funds but not changes in coverage. We explore several alternative aggregation methods where we change the order or weighting of averaging and computing flow, such as first summing domicile -month TNA and then computing domicile flows, as well as constructing flows from winsorized TNA and/or returns. Appendix C explains and summarizes alternative domicile -level flow aggregation procedures. We manually examine outliers and extreme values with flows computed from alternate methods and conclude that alternative domicile level flow calculations are driven primarily by data errors or changes in coverage within the Morningstar data rather than true fund flows. The combined data from Morningstar and CRSP cover the period from March 1990 to December 2019 for 25 countries, including the US.

We use overlaps between Morningstar and the EPFR data to examine and correct discrepancies in the data and to confirm the reliability of our fund flow, return, and domicile aggregation calculations. We manually check all outlier observations of returns, flows, and foreign exchange adjustments using Morningstar, Datastream, Bloomberg, and/or fund websites and either correct misreported values or discard observations that are identified as errors. We drop six countries (Vietnam, Tanzania, Slovakia, Lithuania, Cyprus, and Bangladesh) from our sample because they lack sufficient flow observations that overlap with flows for the US, as used in some of our tests. The merged sample consists of 8,753 domicile -month observations of flows, returns, and TNAs for 60 markets from January 1996 to May 2020.

Our sample statistics are comparable to those of similar datasets in the published literature, such as Ferreira et al. (2012, 2013), although our sample includes roughly twice the number of countries as Ferreira et al. (2012, 2013) and our sample period is over twice as long as theirs. For example, our reported average flows and returns are similar to those reported by Ferreira et al. (2013, Table III, p. 492). Our manual examination of outlier observations would appear to have a similar impact on the overall distribution of returns and flows as Ferreira et al.'s winsorization procedure.

3.2. Socio-political measures

We explore variation in domicile level exposure to global liquidity along three dimensions. First, we employ the standard financial and macroeconomic measures of liquidity, growth, and market status that are common in the literature on international capital flows. These include measures of wealth, growth, trading activity, exchange rate stability, and inflation. Second, our focus on legal domiciles as venues for investment suggests that the legal structure, development, and culture of a domicile should be central to that domicile's integration or segmentation from global liquidity. Our measures of these characteristics include metrics capturing the political and social stability and structure of each domicile, including measures of conflict, corruption, democracy, and the rule of law. Links between these variables and exposure to global liquidity can help inform whether such exposure appears more consistent with healthy financial links or with susceptibility to global liquidity imbalances. Last, we consider grouping variables that may be useful to identify which domiciles display similar patterns of exposure to global liquidity. Grouping measures include regional identifiers and indicators of common cultural and legal structures, such as common law legal systems and emerging market levels of financial development.

Our main source of socio-political indicators is the International Country Risk Guide (ICRG) rating. ICRG provides quantitative economic, financial, political, and composite risk ratings for 93 countries on a monthly basis since January 1984. We standardize all ICRG measures to have a mean of zero and standard deviation of 1. High values by ICRG indicate more favorable or less risky conditions. Baek and Qian (2011) refer to the ICRG measures as the most comprehensive indices of political risk and note that the ICRG measures have the advantage of being directly relevant to foreign investors.

Following Mina (2017), we cluster ICRG measures into three principal component factors (PC1 to PC3) using principal component analysis (PCA). Appendix D describes our PCA procedure and associated diagnostic tests. We assign intuitive names for the three PCs by examining the correlations of the original twelve ICRG measures with the three PCs. PC1 is designated as *business integrity* due to its correlation with the *socioeconomic*, *investment profile*, *corruption*, *law and order*, and *bureaucracy quality* variables. PC2 is labeled *safety from conflict*, from its correlation with the *internal conflict*, *external conflict*, *military*, and *religious* measures.

PC3 is designated as *political stability*, and is most correlated with *government stability*, *ethnic,* and *democratic accountability*. As the larger value for ICRG measures denotes favorable characteristics or less risk, our new three PCs are constructed to follow the same rule.

3.3.Control variables

Our analysis employs control variables from the World Bank (World Development Indicator and Global Economic Monitor), DataStream, Federal Reserve Economic Data (FRED) website Pacific Exchange Rate Services (https://fx.sauder.ubc.ca/data.html), MSCI country indices, and the legal judicial system from La Porta et al. (1997). Jank (2012) shows that macroeconomic variables are associated with MF flows in the US. There is ample evidence suggesting that macroeconomic variables can be correlated across markets (Obstfeld, Rogoff, and Rogoff, 1996). Because of the potential correlation of macroeconomic variables across countries, and the conflicting evidence as to the association between macroeconomic variables and MF flows, we include a range of macroeconomic variables as controls without *a priori* hypothesis as to their direction or magnitude.

Our control variables include measures of GDP growth, GDP per capita, inflation, and exchange rate stability. Karolyi, Lee, and van Dijk (2012) show that emerging markets display greater exposure to global equity market trading liquidity. Exposure is greater for countries with more volatility, higher inflows, weak legal protection, closed financial systems, and less transparency.

The World Development Indicators (WDI) database is the primary World Bank collection of development indicators, compiled from officially recognized international sources. It presents the most current and accurate global development data available and includes national, regional, and global estimates. We obtain annual data from WDI for GDP growth (in percentage), GDP per capita (in US dollar), and inflation (in percentage). Based on the description from the WDI database, GDP growth is the annual percentage growth rate of GDP at market prices based on constant local currency while GDP per capita is gross domestic product divided by midyear population. Inflation is measured as the annual growth rate of the GDP implicit deflator shows the rate of price change in the economy as a whole. For the data for exchange rate stability, we use both DataStream and Pacific Exchange Rate Services in order to get the monthly exchange rate for all countries in our sample.

Measures of exchange rate stability feature prominently in research on cross- domicile fund flows but may be less important with our focus on within-domicile flows. When available, we measure exchange rate stability by the percentage monthly change in real trade-weighted effective exchange rates. If real effective trade-weighted exchange rates are unavailable, then we compute effective exchange rates against a broad basket of major currencies to compute the monthly percentage change in exchange rates. If this is unavailable, we use the percentage change in the exchange rate relative to the US dollar. Calderon and Kubota (2013) show that foreign exchange rate instability is strongly related to exposure to global shifts in liquidity.

Average monthly returns reported in Table 1 are equally-weighted over time and value-weighted across funds in each domicile. Eleven of sixty countries have negative average monthly returns, with Bahrain representing the lowest average monthly return (-1.51%). On the other extreme, Turkey has the highest average monthly return of 2.03% during the sample period. The summary statistics for average flows are interesting: more than half of the domicile have negative average flows. This is consistent with past literature about international MF flows. For example, Ferreira et al. (2012), Ferreira et al. (2013), and Jinjarak et al. (2011) all report negative flows on average for their samples of international funds. The highest average flows in our sample are observed in Indonesia, Taiwan, Philippines, Korea, and Russia.

We use this sample to examine the evolution of MF market integration over time. We break our panel data into five periods: from 1996 to 2000 (Period 1), from 2001 to 2005 (Period 2), from 2006 to 2010 (Period 3), from 2011 to 2015 (Period 4), and from 2016 to 2020 (Period 5). We require at least 12 continuous months of valid data for a domicile to be included in the final sample. The final sample consists of monthly information about flows, returns, and TNAs for 60 countries. Our four main variables of interest are listed in Table 2 for five periods: world flows, US flows, world return, and US return. World flow and world return are constructed as the TNA-weighted average monthly flow and return, respectively, across all countries, excluding the US or domicile i, with valid domicile flows and returns each month. All returns, flows, and TNAs are converted to US dollars if not already reported in US dollars. Reported statistics are then averaged over all sample months. Due to the availability of data, we have more observations for later periods (Periods 4 and 5) than earlier periods. Regarding Period 3, which contains financial crisis duration, the average world return and US return are smaller than in other periods. All of four variables of interest have a higher standard deviation compared with other periods.

4. Methods and models

4.1. Modeling domicile flow across periods

Following Nguyen (2022), we propose the following two contemporaneous models to test for associations between each domicile's flow in our sample with world flow and US flow across periods:

$$Domicile\ flow_{i,t} = \alpha_i + \beta_i\ World\ flow_{i,t} + \varepsilon_{i,t}. \quad (2)$$

and,

$$Domicile\ flow_{i,t} = \alpha_i + \beta_i\ US\ flow_{i,t} + \varepsilon_{i,t}. \quad (3)$$

In order to separate the effect of US flow that correlated with world flow, we run a two-stage regression model, with the first stage having US flow as a dependent variable and world flow as an independent variable:

$$US\ flow_{i,t} = \alpha_i + \beta_i\ World\ flow_{i,t} + \varepsilon_{US\ flow,t}. \quad (4)$$

We label the residual of equation (4), $\varepsilon_{US\ flow,t}$, as the *idiosyncratic component of US flow*. This is the component of US flow that is uncorrelated with world flow, and we use this residual as an explanatory independent variable in the second stage for a modified two-factor equation across five periods:

$$Domicile\ flow_{i,t} = \alpha_i + \beta_{1i}\ World\ flow_{i,t} +$$
$$\beta_{2i} idiosyncratic\ component\ of\ US\ flow_{i,t} + \varepsilon_{i,t}. \quad (5)$$

Next, we analyze the impact of different betas across periods by adding interaction between world flow and time dummy variables for the panel model:

$$Domicile\ flow_{i,t} = \alpha_i + \beta_{0i}\ World\ flow_{i,t} +$$
$$\beta_{1-4i} World\ flow * Dummy\ Period_{1-4,t} + macro\ control\ variables_{i,t} + \varepsilon_{i,t}. \quad (6)$$

Where World flow* Dummy Period can take the value in the following values: WF19962000 (interaction between world flow and Period 1), WF20012005 (interaction between world flow and Period 2), WF20062010 (interaction between world flow and Period 3), WF20112015 (interaction between world flow and Period 4), and WF20162020 (interaction between world flow and Period 5).

4.2. Modeling segmentation and contagion

In this section, we will test for segmentation during crisis periods by using the following time trend analysis and quadratic specifications:

$$Domicile\ flow_{i,t} = \alpha_i + \beta_{1i} World\ flow_{i,t} + \beta_{2i} World\ flow_{i,t} * time\ trend + \varepsilon_{i,t}\ , \quad (7)$$

Where *time trend* is the natural logarithm of the counter for each month, from the first month to the last month. The coefficient β_{2i} represents the overall level of segmentation or integration over time.

Our next model is:

$$Domicile\ flow_{i,t} = \alpha_i + \gamma_{1i} World\ flow_{i,t} + \gamma_{2i} World\ flow_{i,t}{}^2 + \varepsilon_{i,t} \quad (8)$$

where the coefficient γ_{2i} captures contagion (segmentation) during a flow crisis if γ_{2i} is positive (negative).

We estimate a similar model where market volatility is measured by returns rather than flows:

$$Domicile\ flow_{i,t} = \alpha_i + \delta_{1i} World\ flow_{i,t} + \delta_{2i} World\ return_{i,t}{}^2 + \varepsilon_{i,t} \quad (9)$$

where the coefficient δ_{2i} represents contagion (segmentation) during a return crisis if δ_{2i} is positive (negative).

Third, motivated by Arghyrou and Kontonikas (2012), we consider a model of contagion based on implied volatility (VIX):

$$Domicile\ flow_{i,t} = \alpha_i + \varphi_{1i} World\ flow_{i,t} + \varphi_{2i} VIX_t \quad + \varepsilon_{i,t} \quad (10).$$

Following Koenker and Bassett (1978), we examine models (7) to (10) using quantile regression specifications based on domicile flows. Our sample of 8,494 observations is split into four groups of equal size according to domicile flow. Unlike linear regression with the assumption of linearity in means across groups, quantile regressions allow for non-linear breaks in parameters from group to group.

To separate measures of integration and contagion across countries, we next estimate equations (8) and (9) at the domicile level. We refer to γ_{2i} from eq. (8) as a domicile's *sensitivity to extreme global MF flows*. We then use the ICRG database of country level governance measures to characterize which countries display contagion and which countries display valuable diversification possibilities for asset managers (i.e., negative estimates on γ_{2i} in equation (8)). Because the twelve ICRG governance measures are highly correlated, we perform a principal components analysis to extract the three dominant principal components of the ICRG measures. In addition, macroeconomic control variables will be included with equation (11).

In the next step, we take the coefficient estimates of γ_{2i} and δ_{2i} for each domicile from equations (8) and (9) respectively as the dependent variable in the following regression models:

$$Sensitivity\ to\ extreme\ global\ MF\ flows_{i,t} = \alpha_i + \beta_1 Business\ environment_{i,t} + \beta_2 Safety\ from\ conflict_{i,t} + \beta_3 Political\ Stability_{i,t} + \boldsymbol{Controls_{i,t-1}}\ \psi + \varepsilon_{i,t}\ , \quad (11)$$

$$Sensitivity\ to\ extreme\ global\ MF\ flows_{i,t} = \alpha_i + \beta_1 Business\ environment_{i,t} + \beta_2 Safety\ from\ conflict_{i,t} + \beta_3 Political\ Stability_{i,t} + \beta_4 Business\ environment_{i,t} * Worldflow_{i,t} + \beta_5 Safety\ from\ conflict_{i,t} * Worldflow_{i,t} + \beta_6 Political\ Stability_{i,t} * Worldflow_{i,t\ t} + \boldsymbol{Controls_{i,t-1}}\ \psi + \boldsymbol{Controls_{i,t-1} * Worldflow_{i,t}} \phi + \varepsilon_{i,t}. \quad (12)$$

Controls $_{i,t-1}$ represents a vector of macro-economic control variables for each domicile *i* in month *t-1*: GDP growth, GDP per capita, inflation, and exchange rate stability. $\boldsymbol{\gamma}$ and $\boldsymbol{\psi}$ are vectors of coefficient estimates for each domicile *i*.

5. Results

5.1. Analysis of domicile flow across periods

Table 3 reports the average (equally weighted) estimates of equations (2), (3), and (5). The results confirm the correlation between domicile flow and world flow across periods: most countries (more than 80%) have positive estimates of β_i with more than 55% of the countries showing a positively significant correlation with world flow in the last four periods (from 2001 to 2020). On the other hand, we find weak correlations between domicile flows and US flows. Only about 3% of countries display a significant correlation with US flows, and the relationship is weaker over the time. This is no different than that may be expected by chance. For equation (5), when we include the component of US flow that is uncorrelated with world flow as a new explanatory independent variable, the results show that domicile flows are associated with world flow, even after controlling for the $idiosyncratic\ component\ of\ US\ flow_{i,t}$.

Results for fixed effects models are presented in Table 4. Cross-sectional fixed effects help to address the concern that summary regression results in Table 3 are unduly influenced by which countries enter or exit our sample over time (a concern raised by Pukthuanthong and Roll, 2009, in the context of tests of market integration). We re-estimate equations (2), (3), and (5), for our panel data and find that the results from the panel data are similar to the overall results from domicile -by- domicile regression models. In Table 4, domicile flows are positively and significantly correlated with contemporaneous world flow, with the highest beta coefficient in Period 3 (financial crisis period). The results hold for the two-factor equation (eq. 5) of world flow and residual of US flow. In appendix E, we changed the independent variable to lagged 1-month flows, and the significant goes away, suggesting that the relationship is strongest for contemporaneous flows.

Table 5 presents the impact of different betas across periods by adding interaction between world flow and time dummy variables. Except for the first period (1996 to 2000), the beta coefficients for world flow are positive and significant for the rest of the periods, and the relationship is strongest for Period 3. Overall, the results suggest an increase in integration during the financial crisis period of 2005-2010, followed by a weak decline in integration in the consequent periods. This is contrary to H1 but consistent with H2.

5.2.Contagion and sensitivity to extreme global MF flows

Table 6 presents the results of our contagion analysis. Our estimate for eq. (7) indicates no significant time trend in sensitivity to global MF flows. The quadratic term for flow (eq. 8) is significant and negative, indicating the opposite of contagion during periods of extreme global fund flows. The magnitude of the coefficient estimate suggests that sensitivity to global fund flows has a diminishing effect on domicile flow. Evaluated at the sample mean, this implies that domicile flows increase initially with an increase in world flow, but the positive association between domicile flows and the world flows decreases as world flows pass a level of approximately 14.36%. The coefficient estimates on our two return-based contagion measures ($return^2$ in Eq. 9 and *VIX* in Eq. 10) are both small and insignificant.

The results in Table 6 imply that cross-domicile flow correlation decreases during times of extreme flows but are unrelated to periods of extreme returns. This is consistent with return correlations literature (Bekaert et al., 2011). Following Bekaert et al. (2005) and Forbes and Rigobon (2001), equations (8) to (10) differentiate between integration (level of cross- domicile correlation during normal times) and contagion (level of cross- domicile correlation during crisis times). We find significant positive estimates for β_{1i} in equations (7) through (10), indicating that markets for asset management display significant integration regardless of the amount of market stress. However, the significant negative coefficient estimates on β_{2i} indicate a lack of contagion (or, more precisely, negative contagion) in the cases of equation (8).

Estimates from the quantile regression approach are reported in Table 7. Panel A suggests that integration does increase over time, especially for countries or months where flow is high. We further provide detail on the breaking down of the quantile regression into periods and confirm the results in Appendix F.

Panel B of Table 7 indicates that negative contagion during the period of extreme fund flows exists only for those domicile -month observations with low levels of flow. For those domicile-month observations in the top quartile of flows, there is significant evidence of contagion. The two measures of extreme returns (Eq. 9 and 10) yield similar results as for extreme flows and further support the existence of contagion. Panels B, C, and D all demonstrate that domicile-month observations with low levels of flow display negative contagion, while domicile-month observations in the top quartile display evidence of contagion.

Table 8 and 9 show the evaluation of equations (11) and (12). It suggests that countries with better business integrity (PC1) and safety from conflict (PC2) tend to display the strongest indications of integration (e.g., Luxembourg, Germany, Austria, Denmark, and Finland have the highest t-statistics or estimates of β_{2i} in equation (8) and (9)). Smaller countries with well-governed and stable status (PC3) generally take negative estimates for β_{2i}, indicating potentially valuable diversification opportunities for asset managers. Czechia, Guernsey, the Bahamas, Mauritius, Malta, and the Isle of Man has the lowest (i.e., negative) estimates of β_{2i} in equations

(8) and (9). The only evidence that contagion depends on domicile characteristics is that *Safety from conflict* is weakly and negatively associated with contagion when market stress is measured by extreme global returns (as indicated by the last column of Table 9).

6. Conclusion

Our analysis demonstrates that patterns in segmentation, integration, and contagion in the market for asset management (measured by mutual fund flows) are substantially different from patterns that are well-known to apply to equity markets (measured by stock returns). Results indicate an increase in integration during the financial crisis period of 2005-2010, followed by a weak decline in integration in the subsequent decade. Quadratic models show negative contagion, where the association between domicile flows and the world flows decreases during periods of extreme levels of world flow. However, a quantile regression approach shows that negative contagion applies only to domicile-month observations with low levels of domicile fund flows. For observations with high level of flow, there is evidence of significant contagion, where the association between domicile flow and world flow increases in the presence of market stress. Contagion for high-flow observations is robust across measures of market stress constructed from world flows, world returns, and the US VIX index. When contagion is measured domicile-by-domicile, contagion is concentrated in those countries with weaker governance and lower economic development measures. Countries with strong measures of governance and political stability display negative measures of contagion, representing potentially valuable opportunities for asset managers to diversify mutual fund flow risk by more heavily weighting these countries in their portfolios.

Overall, our results do not support hypothesis 1, as our results suggest that market integration decreases over our sample period. We find an increasing trend in flows between 2006 and 2010, but the trend reverses following the 2006-2009 financial crisis (as indicated in Table 5). The time trend in Table 6 provides further evidence against H1. We find mixed evidence for hypothesis 2. Table 6 suggests that association between domicile flows and world flow decreases during periods of extreme global flows. However, Table 7 shows that contagion exists for high-flow domicile-month observations across various measures of extreme market conditions, with low-flow observations driving the full-sample results. Partial weak support for hypothesis 3 is provided by the fact that domiciles with worse scores for safety for conflict display contagion when market stress is measured by extreme global returns.

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TABLES

Table 1: Descriptive statistic of domiciled-level sample data

The table reports summary statistics for monthly observations for 60 countries. Average TNA (in USD) and average return (in percentage) are provided by Morningstar, CRSP Mutual fund for the US, and EPFR. Average flows are provided by EPFR and calculated for Morningstar and CRSP Mutual fund for the US as $Flow_t = TNA_t - TNA_{t-1} *(1+r_t)$, following Sirri and Tufano (1998). We aggregate TNA, returns, and flows across classes when there are multi share classes of a fund. We average flows across funds, weighted by TNA, for each domicile-month in order to get the domicile level aggregate flow if this measure is not already provided. When fund flows are reported quarterly, we distribute these quarterly flows evenly over the three months of the quarter before aggregating at the domicile level. All returns, flows, and TNA is converted to US dollars if not already reported in US dollars.

#	Domicile	Number of observations	Start month	End month	Average TNA	Average monthly return	Average annual return	Average flow
1	Andorra	106	2011-03	2019-12	799.36	0.05%	0.59%	-1.33%
2	Australia	172	2006-02	2020-05	99404.57	0.35%	4.16%	0.62%
3	Austria	223	2001-11	2020-05	18600.41	0.33%	3.96%	-0.03%
4	Bahamas	184	1997-08	2019-12	166.61	0.34%	4.09%	-0.94%
5	Bahrain	33	2006-12	2010-12	292.72	-1.51%	-18.12%	-1.86%
6	Belgium	291	1996-03	2020-05	21637.77	0.25%	2.99%	-0.22%
7	Brazil	112	2011-02	2020-05	4089.25	1.67%	20.02%	-1.31%
8	Bulgaria	52	2016-02	2020-05	111.06	-0.05%	-0.59%	0.06%
9	Canada	291	1996-03	2020-05	312817.01	0.24%	2.87%	-0.33%
10	China	85	2013-05	2020-05	36469.18	0.93%	11.14%	-0.26%
11	Czech	100	2011-05	2019-12	633.44	-0.26%	-3.11%	0.08%
12	Denmark	264	1998-06	2020-05	4901.49	0.40%	4.84%	-0.10%
13	Estonia	163	2006-02	2020-05	173.67	0.25%	3.04%	-0.85%
14	Finland	172	2006-02	2020-05	12351.68	-0.04%	-0.51%	-0.24%
15	France	277	1997-05	2020-05	264365.67	0.01%	0.09%	0.32%
16	Germany	222	2001-02	2020-05	156280.53	0.48%	5.78%	-0.34%
17	Gibraltar	94	2011-03	2019-12	59.93	-0.04%	-0.53%	-0.09%
18	Greece	112	2011-02	2020-05	319.81	0.17%	2.02%	-2.43%
19	Guernsey	106	2011-03	2019-12	10611.64	0.24%	2.91%	-1.03%
20	Hong Kong	270	1996-03	2020-05	18437.57	0.43%	5.20%	0.27%
21	Hungary	58	2011-03	2015-12	238.37	0.09%	1.14%	-2.24%
22	India	110	2011-02	2020-05	170924.79	1.04%	12.42%	0.10%
23	Indonesia	22	2017-08	2020-05	68.52	-1.05%	-12.58%	6.48%
24	Ireland	291	1996-03	2020-05	489512.5	0.27%	3.24%	0.60%
25	Isle of man	105	2011-03	2019-11	374.26	0.03%	0.35%	0.23%
26	Israel	66	2013-05	2018-10	23426.55	0.48%	5.75%	0.02%
27	Italy	112	2011-02	2020-05	140545.75	-0.01%	-0.08%	-0.56%
28	Japan	112	2011-02	2020-05	452715.29	0.64%	7.67%	0.25%
29	Korea	99	2012-03	2020-05	21604.27	0.08%	0.97%	0.87%
30	Kuwait	138	2008-05	2019-12	2416.43	-0.03%	-0.42%	-0.52%

Obs	Domicile	Number of Obs	Start month	End month	Average TNA	Average monthly return	Average annual return	Average flow
31	Liechtenstein	171	2006-02	2020-05	17199.22	-0.14%	-1.71%	-0.36%
32	Luxembourg	291	1996-03	2020-05	1133147.93	0.20%	2.42%	0.38%
33	Malaysia	97	2012-05	2020-05	400.67	0.66%	7.89%	0.38%
34	Malta	106	2011-03	2019-12	1137.91	0.14%	1.70%	-0.27%
35	Mauritius	279	1997-03	2020-05	1959.74	0.92%	11.06%	-0.19%
36	Mexico	112	2011-02	2020-05	3476.86	0.73%	8.71%	-1.20%
37	Monaco	106	2011-03	2019-12	835.5	0.05%	0.62%	0.41%
38	Netherlands	209	2002-02	2020-05	22208.09	0.00%	-0.01%	-0.67%
39	New Zealand	147	2008-03	2020-05	1374.58	0.68%	8.11%	0.33%
40	Nigeria	51	2016-02	2020-05	14.21	0.69%	8.31%	-0.87%
41	Norway	110	2011-04	2020-05	37868.49	0.96%	11.56%	-0.61%
42	Pakistan	25	2018-05	2020-05	3345.88	1.31%	15.78%	-1.18%
43	Philippines	106	2011-03	2019-12	5831.34	0.19%	2.24%	1.07%
44	Portugal	58	2011-03	2015-12	4750.32	-0.42%	-5.03%	-0.26%
45	Qatar	36	2012-02	2015-11	95.11	0.94%	11.28%	-0.03%
46	Romania	52	2016-02	2020-05	3125.4	0.35%	4.26%	-1.09%
47	Russia	111	2011-03	2020-05	1911.49	0.46%	5.50%	0.67%
48	Saudi Arabia	110	2011-03	2020-05	8321.59	0.24%	2.86%	0.52%
49	Singapore	289	1996-03	2020-05	4590.26	0.08%	1.00%	-0.23%
50	Slovenia	84	2011-03	2020-05	511.73	-0.03%	-0.41%	-0.13%
51	South Africa	112	2011-02	2020-05	14833.71	1.44%	17.24%	-0.76%
52	Spain	112	2011-02	2020-05	55733.4	0.27%	3.20%	0.04%
53	Sweden	202	2001-02	2020-05	80518.61	0.74%	8.84%	0.53%
54	Switzerland	291	1996-03	2020-05	146813.22	0.05%	0.59%	-0.17%
55	Taiwan	112	2011-02	2020-05	8650.99	0.31%	3.73%	1.21%
56	Thailand	88	2013-02	2020-05	56555.55	0.19%	2.25%	0.10%
57	Turkey	157	2007-05	2020-05	348.51	2.03%	24.31%	-1.14%
58	UAE	106	2011-03	2019-12	611.44	0.55%	6.57%	-0.93%
59	UK	291	1996-03	2020-05	380710.12	0.49%	5.85%	0.01%
60	USA	290	1996-03	2020-04	12319810.71	0.47%	5.61%	0.31%

Table 2: Descriptive Statistics of world-level measures

The table reports descriptive statistics of world level data for 60 sample MF domiciles over the period from 1996 to 2020. World flow and world return are constructed as the TNA-weighted average monthly flow and return, respectively, across all countries, not including the US or domicile *i*, with valid domicile flows and returns each month. Reported statistics are then averaged over all sample months.

		Number of Obs	Mean	Median	Minimum	Maximum	Std Dev
Period 1 (1996 to 2000)	**World flow**	684	0.41%	0.35%	-3.47%	6.35%	1.51%
	US flow	684	0.56%	0.51%	-0.45%	1.76%	0.51%
	World return	684	-0.11%	-0.08%	-26.12%	17.13%	7.77%
	US return	684	0.81%	1.29%	-8.74%	5.34%	2.74%

Period 2 (2001 to 2005)	**World flow**	941	0.42%	0.10%	-3.66%	4.02%	1.54%
	US flow	941	0.26%	0.19%	-0.73%	2.35%	0.58%
	World return	941	0.22%	0.80%	-13.83%	10.20%	4.85%
	US return	941	0.26%	0.59%	-5.40%	4.46%	2.19%

Period 3 (2006 to 2010)	**World flow**	1307	0.04%	0.31%	-8.00%	7.04%	2.26%
	US flow	1307	0.32%	0.40%	-0.91%	1.60%	0.53%
	World return	1307	0.08%	1.03%	-15.09%	7.63%	3.84%
	US return	1307	0.30%	1.05%	-10.86%	5.12%	3.02%

Period 4 (2011 to 2015)	**World flow**	3045	-0.21%	0.03%	-6.29%	3.89%	1.63%
	US flow	3045	0.16%	0.18%	-0.82%	0.80%	0.29%
	World return	3045	0.59%	0.69%	-4.10%	5.86%	1.87%
	US return	3045	0.44%	0.59%	-5.37%	6.09%	2.09%

Period 5 (2016 to 2020)	**World flow**	2776	0.09%	-0.14%	-4.34%	4.53%	1.43%
	US flow	2733	0.22%	0.15%	-0.83%	3.15%	0.53%
	World return	2776	0.34%	0.23%	-7.33%	4.91%	1.93%
	US return	2733	0.52%	0.98%	-9.67%	7.00%	2.59%

Table 3: Domicile-level sub-periods analysis

The table reports the average *t*-statistic, beta coefficient, R^2 , adjusted R^2 , and the proportion of coefficient estimates that are positive or negative for the single factor model (Panel A) and orthogonalization model (Panel B) for the following return regression models:

$$Domicile\ flow_{i,t} = \alpha_i + \beta_i\ World\ flow_{i,t} + \varepsilon_{i,t},\ (2)$$

$$Domicile\ flow_{i,t} = \alpha_i + \beta_i\ US\ flow_{i,t1} + \varepsilon_{i,t}\ (3)$$

$$Domicile\ flow_{i,t} = \alpha_i + \beta_{1i}\ World\ flow_{i,t} + \beta_{2i}\ idiosyncratic\ component\ of\ US\ flow_{i,t} + \varepsilon_{i,t}\ (5)$$

With i = domicile 1 to 59, excluding the US.

We break our panel data into five periods: from 1996 to 2000 (Period 1), from 2001 to 2005 (Period 2), from 2006 to 2010 (Period 3), from 2011 to 2015 (Period 4), and from 2016 to 2020 (Period 5).

For Panel A, Column (1) reports statistics, the proportion of coefficient estimates that are positive or negative, and significant or insignificant at the 95% level, across countries from the estimate of equation (1) for 5 periods, column (2) reports statistics, the proportion of coefficient estimates that are positive or negative, and significant or insignificant at the 95% level, across countries from the estimate of equation (2) for 5 periods.

For Panel B, Column (1) reports statistics, the proportion of coefficient estimates that are positive or negative, and significant or insignificant at the 95% level, across countries from the estimate of β_{1i} for 5 periods, column (2) reports statistics, the proportion of coefficient estimates that are positive or negative, and significant or insignificant at the 95% level, across countries from the estimate of β_{2i} for 5 periods.

Panel A: Single model

	Equation (2) Average β_i					Equation (3) Average β_i				
	Period 1	**Period 2**	**Period 3**	**Period 4**	**Period 5**	**Period 1**	**Period 2**	**Period 3**	**Period 4**	**Period 5**
Average coefficient estimate	0.26	0.83	1.09	0.70	0.88	-0.56	-0.25	0.35	0.31	-0.16
Average *t*-statistic	1.18	3.47	5.35	4.03	3.49	-0.56	-0.47	0.62	0.31	-0.32
R^2	6.03%	20.08%	34.83%	23.68%	24.13%	9.06%	7.85%	6.65%	4.17%	3.28%
Adjusted R^2	4.09%	18.56%	33.49%	22.22%	22.43%	7.17%	6.06%	4.77%	2.36%	1.11%
N	52.62	55.35	54.46	56.39	49.57	52.62	55.35	54.46	56.39	48.80
Positive beta	69.23%	88.24%	95.83%	81.48%	89.29%	38.46%	35.29%	75.00%	68.52%	39.29%
Negative beta	30.77%	11.76%	4.17%	18.52%	10.71%	61.54%	64.71%	25.00%	31.48%	60.71%
Positive significant beta	38.46%	70.59%	83.33%	61.11%	55.36%	7.69%	5.88%	4.17%	5.56%	3.57%
Negative significant beta	0.00%	0.00%	0.00%	1.85%	1.79%	0.00%	5.88%	0.00%	1.85%	5.36%

Panel B: Orthogonalization model

	Equation (5)									
	Average β_{1i}					Average β_{2i}				
	Period 1	Period 2	Period 3	Period 4	Period 5	Period 1	Period 2	Period 3	Period 4	Period 5
Average coefficient estimate	0.26	0.83	1.09	0.70	0.90	-0.52	-0.30	-0.37	-0.21	-0.10
Average *t*-statistic	1.36	3.72	5.66	4.08	3.60	-0.45	-0.52	-0.10	-0.08	-0.21
R^2	14.84%	28.19%	40.83%	27.51%	27.11%	14.84%	28.19%	40.83%	27.51%	27.11%
Adjusted R^2	11.20%	25.39%	38.33%	24.68%	23.70%	11.20%	25.39%	38.33%	24.68%	23.70%
N	52.62	55.35	54.46	56.39	48.80	52.62	55.35	54.46	56.39	48.80
Positive beta	69.23%	88.24%	95.83%	81.48%	87.50%	30.77%	35.29%	45.83%	50.00%	48.21%
Negative beta	30.77%	11.76%	4.17%	18.52%	12.50%	69.23%	64.71%	54.17%	50.00%	51.79%
Positive significant beta	46.15%	70.59%	83.33%	62.96%	55.36%	7.69%	5.88%	4.17%	3.70%	5.36%
Negative significant beta	7.69%	5.88%	0.00%	1.85%	3.57%	0.00%	5.88%	4.17%	5.56%	5.36%

Table 4: Domicile level panel flow analysis by period

This table reports panel analysis from March of 1996 to May 2020. We run the same model (2), (3), and two-factor model (5) by 5 periods with panel fixed effect. The dependent variable is *domicile flow*.

$Domicile\ flow_{i,t} = \alpha_i + \beta_i\ World\ flow_{i,t} + \varepsilon_{i,t}$ (2)

$Domicile\ flow_{i,t} = \alpha_i + \beta_i\ US\ flow_{i,t} + \varepsilon_{i,t}$ (3)

$Domicile\ flow_{i,t} = \alpha_i + \beta_{1i}\ World\ flow_{i,t} + \beta_{2i}\ idiosyncratic\ component\ of\ US\ flow_{i,t} + \varepsilon_{i,t}$ (5)

We break our panel data into five periods: from 1996 to 2000 (Period 1), from 2001 to 2005 (Period 2), from 2006 to 2010 (Period 3), from 2011 to 2015 (Period 4), and from 2016 to 2020 (Period 5). *t*-statistic are reported below beta coefficient. * significant at 10%.** significant at 5%.*** significant at 1%.

	Equation (2)					Equation (3)					Equation (5)				
P	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
World flow$_{i,t}$	0.22	0.80***	1.08***	0.72***	0.83***						0.22	0.80***	1.08***	0.72***	0.83***
	(1.20)	(5.02)	(6.87)	(6.61)	(8.64)						(1.20)	(5.02)	(6.87)	(6.60)	(8.52)
US flow$_{,t}$						-0.45	-0.32	0.48	0.19	-0.22**					
						(-1.54)	(-1.29)	(1.41)	(0.45)	(-2.06)					
US residual flow$_{i,t}$											-0.39	-0.30	-0.24	-0.32	-0.14
											(-1.27)	(-1.20)	(-0.74)	(-0.81)	(-1.32)
N	58	60	60	60	53	58	60	60	60	52	58	60	60	60	52
Domicile fixed effect			Yes					Yes					Yes		
R^2	1.76%	17.27%	17.61%	10.48%	9.91%	1.66%	7.49%	2.17%	4.26%	3.97%	1.83%	17.48%	17.65%	10.52%	10.09%

Table 5: Domicile level flow test of different betas across periods

The table reports the beta coefficient of world flow variables along with the interaction between world flow and time dummy variables for the panel model:

Domicile flow$_{i,t}$= α_i +β_{0i} *World flow*$_{i,t}$ + $\beta_{1\text{-}4i,t}$ *World flow* * *Dummy Period*$_{1\text{-}4,t}$ +*macro control variable*$_{i,t}$+$\varepsilon_{i,t}$ (6)

Where *World flow** *Dummy Period* can take the value in those following values: WF19962000 (interaction between world flow and Period 1), WF20012005 (interaction between world flow and Period 2), WF20062010 (interaction between world flow and Period 3), WF20112015 (interaction between world flow and Period 4), and WF20162020 (interaction between world flow and Period 5). *t*-statistic are reported below the beta coefficient. * significant at 10%.** significant at 5%.*** significant at 1%.

	Column (1)	Column (2)	Column (3)	Column (4)	Column (5)
World flow$_{i,t}$	0.106742	0.868928***	1.082002***	0.700287***	0.802839***
	(0.48)	(4.15)	(6.62)	(6.17)	(8.11)
WF19962000		-0.76219***	-0.97526***	-0.59354**	-0.6961***
		(-3.13)	(-3.48)	(-2.57)	(-2.95)
WF20012005	0.762186***		-0.21307	0.168642	0.06609
	(3.13)		(-1.11)	(0.86)	(0.32)
WF20062010	0.97526***	0.213074		0.381715**	0.279163*
	(3.48)	(1.11)		(2.51)	(1.86)
WF20112015	0.593544**	-0.16864	-0.38172**		-0.10255
	(2.57)	(-0.86)	(-2.51)		(-1.04)
WF20162020	0.696096***	-0.06609	-0.27916*	0.102552	
	(2.95)	(-0.32)	(-1.86)	(1.04)	
GDPcapital2010$_{t-1}$	0.001281	0.001281	0.001281	0.001281	0.001281
	(0.88)	(0.88)	(0.88)	(0.88)	(0.88)
GDPgrowth$_{t-1}$	0.011826	0.011826	0.011826	0.011826	0.011826
	(0.43)	(0.43)	(0.43)	(0.43)	(0.43)
Inflation$_{t-1}$	-0.01618*	-0.01618*	-0.01618*	-0.01618*	-0.01618*
	(-1.79)	(-1.79)	(-1.79)	(-1.79)	(-1.79)
Exchange rate stability$_{t-1}$	0.063733	0.063733	0.063733	0.063733	0.063733
	(1.50)	(1.50)	(1.50)	(1.50)	(1.50)
Time series length (months)			287		
Domicile FE			Yes		
R^2			9.39%		

Table 6: Domicile level flow test of time trend and quadratic specification

The table reports the beta coefficient of world flow variables with time trend analysis and quadratic specifications:
$Domicile\ flow_{i,t} = \alpha_i + \beta_{1i}\ World\ flow_{i,t} + \beta_{2i}\ World\ flow * time\ trend$ +macro control variable$_{i,t} + \varepsilon_{i,t}$ (7)
$Domicile\ flow_{i,t} = \alpha_i + \gamma_{1i}\ World\ flow_{i,t} + \gamma_{2i}\ World\ flow^2$ +macro control variable$_{i,t} + \varepsilon_{i,t}$ (8)
$Domicile\ flow_{i,t} = \alpha_i + \delta_{1i}\ World\ flow_{i,t} + \delta_{2i}\ World\ return^2$ +macro control variable$_{i,t} + \varepsilon_{i,t}$ (9)
$Domicile\ flow_{i,t} = \alpha_i + \varphi_{1i}\ World\ flow_{i,t} + \varphi_{2i}\ VIX$ +macro control variable$_{i,t} + \varepsilon_{i,t}$ (10)
Where *time trend* is the natural logarithm of the counter for each month, starting from the first month to the last month in equation (7), and VIX is the monthly return of the Cboe Volatility Index, which represents the market's volatility. *t*-statistic are reported below beta coefficient. * significant at 10%.** significant at 5%.*** significant at 1%.

	Equation (7)	Equation (8)	Equation (9)	Equation (10)
World flow$_{i,t}$	0.191056	0.804059***	0.813969***	0.813548***
	(0.27)	(7.85)	(7.82)	(8.06)
***World flow$_{i,t}$* * time trend**	0.077834			
	(0.94)			
World flow$_{i,t}$ ^{2}		-2.79914**		
		(-1.91)		
World return$_{,t}$ ^{2}			-0.18855	
			(-1.03)	
VIX				-0.00004
				(-0.35)
GDPcapital2010$_{t-1}$	0.001167	0.00127	0.001195	0.001169
	(0.81)	(0.86)	(0.83)	(0.80)
GDPgrowth$_{t-1}$	0.007118	0.002088	0.004111	0.002258
	(0.26)	(0.08)	(0.15)	(0.09)
Inflation$_{t-1}$	-0.01944**	-0.01724*	-0.01794*	-0.01798*
	(-2.01)	(-1.82)	(-1.88)	(-1.89)
Exchange rate stability$_{t-1}$	0.070677	0.068265	0.070426	0.070648
	(1.61)	(1.58)	(1.62)	(1.62)
Time series length (months)		287		
Domicile FE		Yes		
R^2	8.93%	8.98%	8.91%	8.90%

Table 7: Quantile regression test of time trend and quadratic specification

The table reports the beta coefficient of world flow variables with quantile regression at 25%, 50%, and 75%:

$Domicile\ flow_{i,t} = \alpha_i + \beta_{1i}\ World\ flow_{i,t} + \beta_{2i}\ World\ flow * time\ trend$ +macro control variable$_{i,t} + \varepsilon_{i,t}$ (7)

$Domicile\ flow_{i,t} = \alpha_i + \gamma_{1i}\ World\ flow_{i,t} + \gamma_{2i}\ World\ flow^2$ +macro control variable$_{i,t} + \varepsilon_{i,t}$ (8)

$Domicile\ flow_{i,t} = \alpha_i + \delta_{1i}\ World\ flow_{i,t} + \delta_{2i}\ World\ return^2$ +macro control variable$_{i,t} + \varepsilon_{i,t}$ (9)

$Domicile\ flow_{i,t} = \alpha_i + \varphi_{1i}\ World\ flow_{i,t} + \varphi_{2i}\ VIX$ +macro control variable$_{i,t} + \varepsilon_{i,t}$ (10)

Where *time trend* is the counter for each month, starting from the first month to the last month in equation (7), and VIX is the monthly return of CBOE Volatility Index, which represents the market's volatility. *t*-statistic are reported below beta coefficient

* significance level of 10%, ** significance level of 5%, *** significance level of 1%

Panel A: Equation (7)

	25%	50%	75%
World flow$_{i,t}$	0.3554	0.1742	-0.1164
	(1.48)	(0.85)	(-0.58)
***World flow$_{i,t}$* *** **time trend**	0.0549*	0.0667***	0.1027***
	(1.89)	(2.61)	(4.15)
GDPcapital2010$_{t-1}$	-0.0016***	-0.0002***	0.0013***
	(-29.55)	(-5.22)	(26.23)
GDPgrowth$_{t-1}$	0.0238	0.0246**	-0.0027
	(1.67)	(2.26)	(-0.23)
Inflation$_{t-1}$	-0.0107	-0.0093	-0.0052
	(-0.97)	(-1.71)	(-0.52)
Exchange rate stability$_{t-1}$	0.0261	0.0237	0.0009
	(1.22)	(1.61)	(0.04)

Panel B: Equation (8)

	25%	50%	75%
World flow$_{i,t}$	0.792***	0.7***	0.7182***
	(30.50)	(26.41)	(29.42)
***World flow$_{i,t}$* ^{2}**	-9.6522***	-0.3215	6.6592***
	(-8.53)	(-0.29)	(6.79)
GDPcapital2010$_{t-1}$	-0.0014***	-0.0002***	0.0011***
	(-24.36)	(-4.26)	(19.33)
GDPgrowth$_{t-1}$	0.014	0.0217**	0.0008
	(1.05)	(2.03)	(0.06)
Inflation$_{t-1}$	-0.0055	-0.0086	-0.0085
	(-0.58)	(-1.57)	(-0.75)
Exchange rate stability$_{t-1}$	0.0179	0.0232	0.0008
	(0.90)	(1.63)	(0.04)

Panel C: Equation (9)

	25%	50%	75%
World flow$_{i,t}$	0.7957***	0.7053***	0.7207***
	(31.00)	(29.55)	(30.98)
***World return$_{,t}$* ^{2}**	-0.3795**	0.0004	0.345
	(-2.05)	(0.00)	(1.48)
GDPcapital2010$_{t-1}$	-0.0016***	-0.0002***	0.0012***
	(-29.38)	(-5.20)	22.83
GDPgrowth$_{t-1}$	0.0219*	0.0208**	-0.0054
	(1.68)	(2.05)	(-0.44)
Inflation$_{t-1}$	-0.0159	-0.0089*	-0.0071
	(-1.34)	(-1.52)	(-0.70)
Exchange rate stability$_{t-1}$	0.0217	0.0239*	-0.0051
	(0.98)	(1.61)	(-0.26)

Panel D: Equation (10)

	25%	50%	75%
World flow$_{i,t}$	0.7546***	0.7048***	0.7475***
	(25.01)	(26.20)	(28.69)
VIX	-0.0003***	0.0000	0.0003***
	(-4.05)	(0.04)	(4.62)
GDPcapital2010$_{t-1}$	-0.0011***	-0.0002*	0.0007***
	(-7.97)	(-1.88)	(5.08)
GDPgrowth$_{t-1}$	0.016	0.0214**	0.0074
	(0.98)	(2.01)	(0.60)
Inflation$_{t-1}$	-0.0101	-0.0089	-0.0155
	(-0.83)	(-1.45)	(-1.59)
Exchange rate stability$_{t-1}$	0.0105	0.0238*	0.0117
	(0.43)	(1.57)	(0.50)

Table 8: Sensitivity to extreme global MF flow analysis

The table reports panel analysis. First we run the following model with panel fixed effect:

$$Domicile\ flow_{i,t}= \alpha_i +\gamma_{1i}\ World\ flow_{i,t} + \gamma_{2i}\ World\ flow^2 + \text{macro control variable}_{i,t}+\varepsilon_{i,t} \quad (8)$$

We refer to γ_{2i} as a domicile's sensitivity to extreme global MF flow. Then, take the coefficient γ_{2i} from each domicile in equation (8) as the dependent variable in the following regression model:

$$Sensitivity\ to\ extreme\ global\ MF\ flow_{i,t}= \alpha_i+\beta_1 Business\ environment_{i,t}+\beta_2 Safety\ from\ conflict_{i,t}+\beta_3 Political\ Stability_{i,t}+\mathbf{Controls}_{i,t-1}\ \psi+\varepsilon_{i,t}\ , \quad (11)$$

$$Sensitivity\ to\ extreme\ global\ MF\ flow_{i,t}= \alpha_i+\beta_1 Business\ environment_{i,t} + \beta_2 Safety\ from\ conflict_{i,t}+ \beta_3 Political\ Stability_{i,t} + \beta_4 Business\ environment_{i,t}{*}Worldflow_{i,t} + \beta_5 Safety\ from\ conflict_{i,t}{*}Worldflow_{i,t} + \beta_6 Political\ Stability_{i,t}{*}Worldflow_{i,t} + \mathbf{Controls}_{i,t-1}\ \psi + \mathbf{Controls}_{i,t-1}{*}\mathbf{Worldflow}_{i,t}\boldsymbol{\phi} + \varepsilon_{i,t}, \quad (12)$$

t-statistic are reported below beta coefficient. * significant level of 10%. ** significant level of 5% *** significant level of 1%

	Dependent variable= γ_{2i} from equation (8)		
World flow$_{i,t}$	-2.4667		-8.28057***
	(-0.93)		(-5.64)
Business environment$_{i,t}$	0.2689***	0.268055***	-0.00483
	(9.79)	(9.76)	(-1.28)
Business environment$_{i,t}$* World flow$_{i,t}$	-0.1574		
	(-0.63)		
Safety from conflict$_{i,t}$	0.2092***	0.209273***	-0.00275
	(10.14)	(10.18)	(-0.72)
Safety from conflict$_{i,t}$* World flow$_{i,t}$	0.127		
	(0.38)		
Political Stability$_{i,t}$	-0.0854***	-0.08597***	0.003105
	(-5.47)	(-5.52)	(1.46)
Political Stability$_{i,t}$* World flow$_{i,t}$	0.4412		
	(1.64)		
GDPcapital2010$_{t-1}$	0.0482***	0.048314***	0.00072
	(5.75)	(5.79)	(0.53)
GDPgrowth$_{t-1}$	-0.301	-0.2898	0.00113
	(-1.12)	(-1.09)	(0.03)
Inflation$_{t-1}$	-0.0257	-0.00805	-0.04678
	(-0.26)	(-0.08)	(-1.30)
Exchange rate stability$_{t-1}$	0.103	0.110473	0.007404
	(0.43)	(0.46)	(0.18)
World flow$_{i,t}$ ^{2}			6.034678
			(0.20)
World flow$_{i,t}$ ^{2}*Business environment$_{i,t}$			-0.75054
			(-0.48)
World flow$_{i,t}$ ^{2}*Safety from conflict$_{i,t}$			-3.36059
			(-1.53)
World flow$_{i,t}$ ^{2}*Political Stability$_{i,t}$			-0.51488
			(-0.37)
Time series length (months)	287	287	287
Domicile FE	Yes	Yes	Yes
R^2	84.88%	84.87%	18.86%

Table 9: Sensitivity to extreme global MF returns analysis

The table reports panel analysis. First we run the following model with panel fixed effect:
$Domicile\ flow_{i,t} = \alpha_i + \delta_{1i}\ World\ flow_{i,t} + \delta_{2i}\ World\ return^2 + \text{macro control variable}_{i,t} + \varepsilon_{i,t}$ (9)
We refer to δ_{2i} as a domicile's sensitivity to extreme global MF flows. Then, take the coefficient δ_{2i} from each domicile in equation (9), as the dependent variable in the following regression model:
$Sensitivity\ to\ extreme\ global\ MF\ flow_{i,t} = \alpha_i + \beta_1 Business\ environment_{i,t} + \beta_2 Safety\ from\ conflict_{i,t} + \beta_3 Political\ Stability_{i,t} + \mathbf{Controls_{i,t-1}}\ \psi + \varepsilon_{i,t}$, (11)
$Sensitivity\ to\ extreme\ global\ MF\ flow_{i,t} = \alpha_i + \beta_1 Business\ environment_{i,t} + \beta_2 Safety\ from\ conflict_{i,t} + \beta_3 Political\ Stability_{i,t} + \beta_4 Business\ environment_{i,t} * Worldflow_{i,t} + \beta_5 Safety\ from\ conflict_{i,t} * Worldflow_{i,t} + \beta_6 Political\ Stability_{i,t} * Worldflow_{i,t\ t} + \mathbf{Controls_{i,t-1}}\psi + \mathbf{Controls_{i,t-1}} * \mathbf{Worldflow_{i,t}}\boldsymbol{\phi} + \varepsilon_{i,t}$, (12)
t-statistic are reported below beta coefficient.* significant at 10%.** significant at 5%. *** significant at 1%

	Dependent variable= δ_{2i} from equation (9)		
World flow$_{i,t}$	-3.3525		-8.16631***
	(-1.05)		(-5.55)
Business environment$_{i,t}$	0.4581***	0.456358***	-0.00447
	(14.55)	(14.5)	(-1.13)
Business environment$_{i,t}$* World flow$_{i,t}$	-0.3454		
	(-1.21)		
Safety from conflict$_{i,t}$	0.2337***	0.23398***	-0.00166
	(9.81)	(9.84)	(-0.41)
Safety from conflict$_{i,t}$* World flow$_{i,t}$	0.1659		
	(0.37)		
Political Stability$_{i,t}$	-0.1527***	-0.15325***	0.002338
	(-8.89)	(-8.94)	(1.16)
Political Stability$_{i,t}$* World flow$_{i,t}$	0.4585		
	(1.67)		
GDPcapital2010$_{t-1}$	0.0893***	0.089528***	0.00072
	(8.51)	(8.58)	(0.60)
GDPgrowth$_{t-1}$	0.0406	0.057887	0.01488
	(0.17)	(0.25)	(0.54)
Inflation$_{t-1}$	0.0993	0.119084	-0.05464
	(0.99)	(1.22)	(-1.61)
Exchange rate stability$_{t-1}$	0.0897	0.158661	0.040907
	(0.39)	(0.70)	(1.04)
World return$_{i,t}$ ^{2}			-1.8271
			(-0.20)
World return$_{i,t}$ ^{2}* Business environment$_{i,t}$			-0.47655
			(-0.93)
World return$_{i,t}$ ^{2}* Safety from conflict$_i$			-0.89516*
			(-1.76)
World return$_{i,t}$ ^{2}* Political Stability$_{i,t}$			0.495591
			(1.16)
Time series length (months)	287	287	287
Domicile FE	Yes	Yes	Yes
R^2	87.28%	87.26%	18.87%

ONLINE APPENDIX A

A1. Morningstar (MS) data collection process

Using Morningstar Direct, we acquired data for international mutual funds domiciled in 82 markets from 1982 to 2019. Initially, we have 370,000 global funds, not including the US. We collect data on monthly total net assets (TNA), returns, and other fund characteristics, such as fees and expenses. Due to legal, accounting, and data coverage details, many variables are not exactly comparable from one country to another. Here are the steps we take in order to manually collect our dataset from MS:

-First, we select "Global Databases" then select "Global Open-End Funds".

-We "search" manually for each domicile and uncheck the box "Only Surviving Investments". We select relevant time series variables such as Net Assets- share class (monthly) and monthly return under "Edit Data."

-Due to the data limitation, we can only download 5,000 funds at one time for each domicile. We later merge funds within a domicile together and transpose them into a useable format.

However, we only consider those observations that are valid to our analysis, which contain both information about TNA and return. Next, we impose multiple standard conditions in the finance literature to clear the data, such as removing missing observations, restricting TNA to be greater than 1, and winsorizing our flow variable at 1% of each country-month observation. This leaves us with information of 22 countries.

A2. Emerging Portfolio Fund Research (EPFR) data collection process

We receive two separate sets of data from EPFR: the first set contains information at fund-level of 7 countries, and the second set contains information at the country aggregated level for the rest of the countries. In order to be consistent, we aggregate fund-level with multi share classes, then aggregate TNA, returns, and flows across classes. We set the condition similar to MS data, such as removing missing observation, restricting TNA to be greater than 1, winsorizing our flow variable at 1% of each country-month observation

Table A1: MS Domiciled-level descriptive statistics

The table reports summary statistics for monthly observations for 22 countries. Average TNA (in USD) and average return (in percentage) are provided by Morningstar. Average flows are calculated as $Flow_t = TNA_t - TNA_{t-1} * (1+r_t)$ following Sirri and Tufano (1998). We aggregate TNA, returns, and flows across classes when there are multi share classes of a fund. We average flows across funds, weighted by TNA, for each domicile-month in order to get the domicile level aggregate flow, if this measure is not already provided. All returns, flows, and TNA is converted to US dollars if not already reported in US dollars.

#	Domicile	Number fund-month obs	start date	end date	Min TNA	Average monthly TNA	maxTNA	min Return	Average monthly Return	max Return	min Flow	Average monthly Flow	max Flow
1	Andorra	2262	2011-02	2019-12	1.02	38.052	741.98	-15.41%	0.03%	13.78%	-0.902	0.010	11.28
2	Bahamas	308	2011-02	2019-12	1.96	34.237	169	-13.45%	0.32%	15.90%	-0.544	-0.006	1.25
3	Curacao	107	2011-02	2019-12	103.10	135.987	157.25	-7.48%	0.26%	7.64%	-0.194	-0.004	0
4	Czechia	759	2011-02	2019-12	7.00	84.764	699.84	-17.88%	-0.09%	12.42%	-0.600	-0.002	0.75
5	Gibraltar	348	2011-02	2019-12	1.02	17.904	42.93	-16.61%	-0.05%	24.19%	-0.479	0.001	0.55
6	Guernsey	15190	2011-02	2019-12	1.00	74.766	4069.57	-41.43%	0.18%	26.22%	-1.019	0.020	80.58
7	Hungary	605	2011-02	2015-03	1.10	21.522	130	-21.09%	0.16%	20.26%	-0.788	0.012	2.99
8	Isle of Man	1437	2011-02	2019-12	1.00	27.78	613.31	-21.51%	-0.05%	15.29%	-0.872	-0.003	7.06
9	Italy	47964	2011-02	2016-12	1.01	251.867	11697.44	-21.31%	-0.10%	29.81%	-1.056	0.042	1419.78
10	Kuwait	2372	2011-02	2019-12	2.06	98.927	647.8	-34.96%	-0.21%	49.50%	-0.714	-0.003	2.77
11	Liechtenstein	44783	2011-02	2019-12	1.00	38.571	3302.63	-60.76%	0.05%	91.33%	-1.047	0.018	83.68
12	Malta	3242	2011-02	2019-12	1.01	37.42	780.92	-20.54%	0.11%	26.82%	-0.975	0.010	12.49
13	Mauritius	2740	2011-02	2019-12	1.00	45.227	1016.97	-25.37%	0.33%	27.60%	-0.897	0.012	3.65
14	Monaco	1146	2011-02	2019-12	4.79	77.428	832.82	-14.25%	0.29%	12.35%	-0.443	-0.002	0.89
15	Philippines	2627	2011-02	2019-12	1.32	236.018	2949.81	-15.48%	0.33%	12.84%	-0.907	0.013	4.16
16	Portugal	2389	2011-02	2016-12	1.01	136.027	1111.03	-26.44%	-0.26%	20.18%	-0.306	-0.005	1.24
17	Qatar	261	2011-02	2019-11	7.55	26.535	91.48	-14.75%	0.68%	11.54%	-0.463	0.016	4.95
18	Russia	5595	2011-02	2019-12	1.00	23.663	537.58	-36.77%	-0.09%	42.79%	-0.499	0.012	31.66
19	Saudi Arabia	8053	2011-02	2019-12	1.01	114.809	5070.23	-22.97%	0.41%	29.87%	-0.974	0.015	54.33
20	Slovenia	2300	2011-02	2016-12	1.00	16.406	253.08	-19.34%	-0.02%	32.09%	-0.585	0.009	4.23
21	United Arab Emirates	1751	2011-02	2019-12	1.00	37.097	285.22	-25.34%	0.44%	17.76%	-0.940	-0.004	5.78
22	Uganda	51	2016-11	2019-12	1.07	4.072	7.55	-3.78%	0.60%	5.72%	-0.376	0.024	0.4

ONLINE APPENDIX B

This table reports list of countries in our sample for EPFR fund-level and country-level, MS, and CRSP. We also have ICI data, but we will use that for further analysis.

Alphabetical order	EPFR country-level	EPFR fund-level	MS	CRSP	ICI
A	Australia	Australia	Andorra		Argentina
		Austria			Australia
					Austria
B	Brazil	Bahrain	Bahamas		Belgium
		Belgium			Brazil
		Brazil			Bulgaria
		Bulgaria			
C	Canada	China	Curacao		Canada
		Columbia	Czech		Chile
					China
					Chinese Taipei
					Costa Rica
					Croatia
					Cyprus
					Czechia
D		Denmark			Denmark
E		Estonia			
F		Finland			Finland
		France			France
G		Germany	Gibraltar		Germany
		Greece	Guernsey		Greece
H		Hong Kong			
		Hungary	Hungary		Hungary
I	India	India	Isle of man		India
		Indonesia	Italy		Ireland
		Ireland			Italy
		Israel			
		Italy			
J		Japan			Japan
K		Korea (South)	Kuwait		
L		Luxembourg	Liechtenstein		Liechtenstein
					Luxembourg
M		Malaysia	Malta		Malta
		Mexico	Mauritius		Mexico
			Monaco		
N		Netherlands			Netherlands
		New Zealand			New Zealand

		Nigeria			Norway
		Norway			
P		Philippines	Philippines		Pakistan
		Portugal	Portugal		Philippines
					Poland
					Portugal
Q			Qatar		
R		Romania	Russia		Romania
					Russia
S	South Africa	Singapore	Saudi Arabia		Slovakia
		Slovenia	Slovenia		Slovenia
		South Africa			South Africa
		Spain			South Korea
		Sweden			Spain
		Switzerland			Sweden
					Switzerland
T	Turkey	Taiwan			Trinidad & Tobago
		Thailand			Turkey
U	United Kingdom		UAE	US	United Kingdom
			Uganda		United States

Table B2: List of offshore centers in our dataset for correction

This table reports offshore centers in 2 datasets: EPFR and MS. We will use available information on the instrument composition of those countries' mutual funds and the geographical breakdown by instrument of the foreign portfolio assets of them. First, we will collect data for market shares of countries invested in those countries for each year in order to generate a time series of MF market shares. Then, we will reallocate those offshore centers' net assets and flows to those countries based on the reported market shares. After that, we will rerun any analysis with the reallocated countries' assets.

EPFR data	**MS**
Ireland	Curacao
Luxembourg	Gibraltar
Singapore	Guernsey
Hong Kong	Isle of Man
	Monaco

ONLINE APPENDIX C

Table C1: TNA country coverage by the end of 2018

This table reports list of country's TNA coverage in our sample by the end of 2018. ICI data report data of regulated open-ended funds, which include mutual funds, exchange-traded funds (ETFs), and institutional funds. ETFs are included in Canada beginning in 2017. Beginning in 2014, data from Brazil and European jurisdictions (where applicable) include ETFs. Funds of funds are excluded except where noted. France, Ireland, Luxembourg, Netherlands, Romania, Spain, and Turkey include funds of funds. Finland, Germany, and Italy exclude funds of funds beginning in 2014, Malta beginning in 2013. Slovakia includes funds of funds beginning in 2014. For the Netherlands, data between 2011 and 2014 are estimated based upon European Central Bank and IIFA sources. Countries from MS data cover open-ended fund and ETF

Country	Our data	ICI stat[8]	% coverage
Philippines	8,383	4,877	171.89%
Romania	3,333	4,726	70.52%
Canada	603,563	1,163,469	51.88%
Portugal	6,678	13,149	50.79%
Slovenia	1,258	2,528	49.76%
Malta	1,572	3,185	49.36%
Sweden	160,642	336,156	47.79%
Liechtenstein	20,315	50,871	39.93%
UK	585,110	1,682,857	34.77%
Luxembourg	1,396,141	4,654,017	30.00%
India	76,977	296,868	25.93%
Ireland	670,007	2,772,568	24.17%
Finland	22,143	100,005	22.14%
Germany	309,324	2,198,505	14.07%
France	252,992	2,074,766	12.19%
Czechia	1,097	12,514	8.77%
Austria	13,899	165,036	8.42%
Greece	360	4,744	7.59%
Spain	18,864	324,856	5.81%
Bulgaria	46	822	5.60%
Italy	12,499	236,504	5.28%
South Africa	8,029	154,995	5.18%
Denmark	6,230	138,232	4.51%
Netherland	29,916	858,681	3.48%
Australia	48,684	1,946,433	2.50%
Hungary	340	15,486	2.20%
Turkey	90	7,407	1.22%
Brazil	5,009	1,211,436	0.41%

[8] https://www.icifactbook.org/deployedfiles/FactBook/Site%20Properties/pdf/2019/19_fb_table65.pdf

ONLINE APPENDIX D

Table D1: Correlations of ICRG variables and principal components.

This table provides Pearson correlation coefficients for the underlying ICRG political, social, and economics measures (listed in the first column) and our three principal components (listed in the first row). *p*-values are given in italics underneath each correlation coefficient.

	Business environment	*Safety from conflict*	*Political stability*
Government stability	0.15247	0.12787	0.73767
	<.0001	*<.0001*	*<.0001*
Socio-economic	0.83538	0.06408	0.2494
	<.0001	*<.0001*	*<.0001*
Investment profile	0.71318	0.14401	0.22742
	<.0001	*<.0001*	*<.0001*
Internal conflict	0.42298	0.71352	0.27665
	<.0001	*<.0001*	*<.0001*
External conflict	0.05928	0.82339	0.03436
	<.0001	*<.0001*	*0.0022*
Corruption	0.78985	0.39696	-0.03789
	<.0001	*<.0001*	*0.0008*
Military in politics	0.52119	0.71199	-0.03527
	<.0001	*<.0001*	*0.0017*
Religious tensions	0.26189	0.63827	0.10276
	<.0001	*<.0001*	*<.0001*
Law and order	0.82153	0.32264	0.0553
	<.0001	*<.0001*	*<.0001*
Ethnic tensions	0.28895	0.28345	0.59308
	<.0001	*<.0001*	*<.0001*
Democracy	0.32329	0.47493	-0.69262
	<.0001	*<.0001*	*<.0001*
Bureaucracy quality	0.80205	0.40486	-0.06136
	<.0001	*<.0001*	*<.0001*

Table D2: Means for ICRG measures and controls, by domicile

domcile	Andorra	Australia	Austria	Bahamas	Belgium	Brazil	Bulgaria	Canada	China	Czechia	Denmark	Estonia	Finland	France
Business environment	-0.48	0.85	0.67	-0.93	0.13	-1.95	-1.11	0.86	-1.13	-0.61	1.14	-0.59	0.61	0.16
Safety from conflict	-0.18	0.17	0.58	1.51	0.57	0.26	0.07	0.43	-2.17	0.74	-0.14	0.09	1.18	-0.43
Political stability	-1.11	-0.61	-0.46	0.74	-0.69	-0.56	-0.05	-0.53	1.34	-0.29	-0.55	-0.53	0.07	-0.68
GDPcapital2010	10.34	10.89	10.76	10.29	10.66	9.34	9.05	10.71	8.85	9.98	10.98	9.76	10.76	10.61
GDPgrowth	1.18%	2.71%	1.56%	1.93%	1.85%	0.68%	3.44%	2.76%	6.95%	2.38%	1.50%	2.89%	0.99%	1.63%
Inflation	0.56%	2.71%	1.77%	4.29%	1.57%	6.47%	3.81%	1.59%	1.98%	1.75%	1.75%	4.29%	1.77%	1.27%
Exchange rate	-0.009%	0.004%	0.000%	-0.014%	0.000%	-0.352%	0.087%	0.019%	0.071%	-0.041%	-0.009%	0.016%	0.015%	0.000%

domicile	Germany	Gibraltar	Greece	Guernsey	Hong Kong	Hungary	India	Indonesia	Ireland	Isle of Man	Israel	Italy	Japan	Israel
Business environment	0.67	0.77	-1.41	0.78	-0.16	-1.04	-0.62	-0.56	0.29	0.78	1.35	-1.18	0.69	1.35
Safety from conflict	0.22	-0.21	0.65	-0.21	-0.10	0.84	-1.80	-2.63	0.84	-0.21	-3.29	0.95	-0.33	-3.29
Political stability	-0.34	-0.84	-0.77	-0.82	1.76	-0.34	-1.66	-0.13	0.26	-0.82	-1.36	-0.36	0.48	-1.36
GDPcapital2010	10.66	10.64	10.05	10.64	10.29	9.53	7.47	8.38	10.84	10.64	10.42	10.46	10.76	10.42
GDPgrowth	1.27%	1.83%	-1.51%	1.86%	3.04%	2.08%	6.57%	5.09%	5.71%	1.86%	3.49%	0.07%	0.97%	3.49%
Inflation	1.32%	1.79%	-0.41%	1.78%	1.11%	2.91%	4.62%	2.83%	2.34%	1.78%	1.41%	1.09%	0.20%	1.41%
Exchange rate	0.000%	0.007%	0.005%	0.006%	-0.023%	-0.255%	0.074%	-0.074%	0.000%	-0.002%	0.101%	0.005%	-0.238%	0.101%

domicile	Luxembourg	Malaysia	Malta	Mauritius	Mexico	Monaco	Netherlands	New Zealand	Nigeria	Norway	Pakistan	Philippines	Portugal	Qatar
Business environment	0.77	-0.45	-0.68	-1.67	-1.68	0.10	0.78	1.11	-2.56	1.17	-0.89	-1.44	-1.03	-0.40
Safety from conflict	0.98	-0.58	1.37	1.24	-0.38	-0.66	0.31	0.30	-2.13	0.26	-3.40	-1.05	0.84	-1.20
Political stability	0.53	0.13	-0.17	0.45	-0.35	-1.62	-0.53	-0.59	-1.10	-0.39	-1.11	-0.28	-0.45	2.78
GDPcapital2010	11.51	9.32	10.13	8.91	9.21	10.65	10.84	10.49	7.79	11.41	7.08	7.92	9.98	11.10
GDPgrowth	3.50%	5.05%	5.93%	4.18%	2.41%	1.30%	1.45%	2.35%	0.94%	1.63%	2.93%	6.34%	-0.79%	4.16%
Inflation	2.45%	1.41%	2.08%	4.04%	4.32%	0.87%	1.51%	2.09%	10.35%	1.83%	6.16%	2.01%	0.90%	-3.29%
Exchange rate	0.000%	-0.131%	-0.010%	0.003%	-0.145%	-0.009%	-0.007%	0.006%	0.180%	-0.195%	0.117%	0.081%	-0.082%	0.252%

domicle	Romania	Russia	Saudi Arabia	Singapore	Slovenia	South Africa	Spain	Sweden	Switzerland	Thailand	Turkey	UAE	UK	USA
Business environment	-2.17	0.10	0.35	1.60	-0.92	-2.19	-0.48	0.84	0.71	-1.25	-0.85	0.05	1.08	0.88
Safety from conflict	0.70	-1.19	-1.10	0.82	-1.30	0.58	-0.18	0.66	0.59	-2.46	-2.67	-0.94	-0.42	-0.51
Political stability	-0.83	-1.06	-0.32	0.72	-1.35	-0.52	-1.11	-0.20	0.23	0.59	-0.39	2.03	-0.31	0.36
GDPcapital2010	9.33	-1.75	-1.18	0.46	0.34	8.92	10.34	10.88	11.18	8.69	9.44	10.57	10.57	10.78
GDPgrowth	5.11%	-2.22	-1.37	0.26	0.51	1.51%	1.16%	2.01%	1.90%	2.98%	4.58%	3.74%	2.09%	2.45%
Inflation	5.14%	-2.07	-0.89	0.44	-0.46	5.45%	0.56%	1.78%	0.41%	1.54%	9.09%	0.51%	1.93%	1.88%
Exchange rate	-0.007%	-1.11	-0.23	0.07	0.23	-0.218%	0.005%	-0.099%	0.001%	0.115%	-0.221%	0.000%	0.001%	0.048%

ONLINE APPENDIX E

This appendix reports the robustness test for domicile level panel flow analysis for lagged equation (2) and (3)

$$Domicile\ flow_{i,t} = \alpha_i + \beta_i\ World\ flow_{i,t-1} + \varepsilon_{i,t}, \tag{2'}$$

$$Domicile\ flow_{i,t} = \alpha_i + \beta_i\ US\ flow_{i,t-1} + \varepsilon_{i,t}. \tag{3'}$$

Appendix E1: Domicile level panel flow analysis, by period

This table reports panel analysis from January of 2000 to December 2018. We run model (2') and (3') by 4 period with panel fixed effect. The dependence variable is *domicile flow*

$domicile\ flow_{i,t} = \alpha_i + \beta_i\ World\ flow_{i,t-1} + \varepsilon_{i,t}$ (2')

$domicile\ flow_{i,t} = \alpha_i + \beta_i\ US\ flow_{i,t-1} + \varepsilon_{i,t}$ (3')

We break our panel data into four periods: from 2000 to 2004 (P=1), from 2005 to 2009 (P=2), from 2010 to 2014 (P=3), and from 2015 to end of 2018 (P=4). *t*-statistic are reported below beta coefficient.

.* significant at 10%.** significant at 5%. *** significant at 1%

	Equation (2')				Equation (3')			
P	1	2	3	4	1	2	3	4
$World\ flow_{i,t-1}$	0.37***	0.35*	-0.22**	-0.07				
	(2.74)	(1.72)	(-2.06)	(-0.4)				
$US\ flow_{i,t-1}$					-0.10	0.11	-0.07	-0.45
					(-0.6)	(0.43)	(-0.29)	(-1.49)
N	59	60	60	36	59	60	60	36
Domicile fixed effect	Yes				Yes			
R^2	15%	6%	4%	8%	15%	6%	4%	8%

ONLINE APPENDIX F

This table reports the beta coefficients for quantile regression for equation (7) across periods:

$$Domicile\ flow_{i,t} = \alpha_i + \beta_{1i} World\ flow_{i,t} + \beta_{2i} World\ flow_{i,t} * time\ trend + \varepsilon_{i,t} , \quad (7)$$

Table F1: Quantile regression test of time trend across periods

Equation (7)

	P=1 (1996-2000)			P=2(2001-2005)			P=3(2006-2010)			P=4(2011-2015)			P=5(2016-2020)		
	25%	50%	75%	25%	50%	75%	25%	50%	75%	25%	50%	75%	25%	50%	75%
World flow	1.50	0.36	0.24	4.83	1.00	0.89	-0.85	-2.10	-1.18	2.86	1.11	0.73	-2.96	-4.39	-4.32
World flow* time trend	-0.22	-0.03	0.01	-0.59	-0.04	-0.02	0.24	0.39	0.26	-0.25	-0.06	-0.02	0.41	0.58	0.58
$GDPcapital2010_{t-1}$	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
$GDPgrowth_{t-1}$	-0.07	-0.05	-0.16	0.05	0.09	0.06	0.06	0.02	-0.04	0.03	0.01	-0.03	-0.02	0.06	0.07
$Inflation_{t-1}$	0.00	-0.01	-0.02	-0.06	0.02	0.12	-0.04	-0.04	-0.07	-0.01	0.02	0.02	-0.04	-0.02	-0.04
Exchange rate $stability_{t-1}$	-0.17	-0.02	-0.11	-0.16	-0.10	0.01	0.09	-0.01	0.03	0.05	0.05	0.01	-0.02	0.01	0.03

CHAPTER 3

Intransitivity in international mutual fund returns and flows

Abstract

We examine how international mutual fund (MF) flows are largely uncorrelated with the United States' (US) MF flows, although non-US MF flows are associated with non-US MF returns, non-US MF returns are strongly associated with US MF returns, and US MF returns are associated with US MF flows. We refer to this puzzle as the intransitivity of international MF flows. To explain the intransitivity of international MF flows, we decompose domicile-level MF returns into a component that is associated with US returns and an idiosyncratic domicile-level return component. We then decompose US MF flows into an expected component based on US MF returns and an unexpected component. We explain the intransitivity puzzle by showing that domicile fixed-effects, macro-economic control variables, and the aggregation of fund-level data to domicile-level flows reconcile the apparent inconsistencies in the international MF flow and performance associations.

1. Introduction

This study follows first essay of my dissertation (Nguyen, 2022), by extending the scope of knowledge about international domicile-level mutual fund (MF) flows, and how these flows are associated with worldwide MF flows and returns. We focus on explaining the intransitivity of international MF flows. By intransitivity, we refer to the puzzle of how international MF flows are largely uncorrelated with the United States' (US) MF flows, although non-US MF flows are associated with non-US MF returns, non-US MF returns are strongly associated with US MF returns, and US MF returns are associated with US MF flows. That is, if we take non-US MF flows as A, non-US MF returns as B, US MF returns as C, and US MF flows as D, then we have:

$$A \approx B \approx C \approx D, \qquad (1)$$

where ≈ indicates a positive association. However, the findings from Nguyen (2022) show that $A \neq D$, where ≠ indicates no association. The goal of this paper is to explain how the associations given in Equation (1) can appear to hold empirically, while $A \neq D$ is also true.

The international capital flow literature generally uses either past flows to explain future market returns (e.g., Froot et al., 2001) or past performance to predict future flow (for example, Jinjarak, Wongswan, and Zheng, 2011). Yet, to our knowledge, no papers provide comprehensive cross-domicile evidence of how domicile-level MF flows are associated with both returns and flows from other countries (a global factor in world MF flow and returns) or the leading role of US MF flows in any such global factor. We aim to fill this gap and provide new insights into how US and global factors by explaining the intransitivity of international MF flows.

There are several reasons why it is important to understand the role of international MF flow intransitivity. First, there is limited evidence about the MF flow and performance relationship internationally. The closest related paper belongs to Ferreira et al. (2012). Using data for 28 countries, they study how MF flows depend on past performance and find that MF investors in more developed countries sell losers more and buy winners less. However, while Ferreira et al. (2012), document differences in the domestic MF flow-performance relationship across countries, they do little to model cross-domicile MF flow correlations and how these are tied to their findings on within-domicile flow-performance associations. We extend this topic by including more countries and building a new model with world and US flow variables to control for the simultaneous effect of other countries' MF flow.

Second, understanding the dynamic nature of international portfolio flows, in general, and MF flow in particular, helps investors and regulators to predict the boom-bust cycle of local asset prices and thereby manage the spread of financial contagion across markets. For example, Claessens, Dooley, and Warner (1995) study the volatility of short-term and long-term capital flows and find that long-term flows are at least as unpredictable as short-term flows, and existing knowledge of long-term flow does not improve the ability to forecast the aggregate capital account. Levchenko and Mauro (2007) show that during "sudden stops," portfolio equity flows are volatile while portfolio debt flows experience a reversal, and other flows (including bank loans and trade credit) experience severe drops and often remain depressed for years.

Third, it is interesting to use MF flow as a channel to study differences in the degree of market-efficiency among countries (developed and emerging). As implied from the theoretical work by Berk and Green (2004), MF investors may recognize a fund manager's skill and direct MF flows to the most productive fund in an efficiently functioning market for asset management. Broner, Gelos, and Reinhart (2006) carry out empirical testing of emerging market MFs and the role they play in the transmission of shocks across countries. They find that when funds' returns are below average, they reduce their exposure to countries in which they were overweight and vice versa. Using portfolio flows between more-developed and less-developed countries, Ferreira and Laux (2009) show that both inflows and outflows of a domicile's funds are predictive of GDP growth, but the effect of inflows is stronger for less-developed countries. Our work can be used to evaluate how efficiently money and information flows between investors and asset managers both within and across countries.

Our research yields several conclusions. We find that non-US domicile flows are significantly and positively associated with the idiosyncratic component of domicile returns and the expected component of US flow, but not with the unexpected component of US flow. However, these associations are no longer apparent after correcting for time fixed effects or control variables for macro-economic conditions and market liquidity. Therefore, the apparent intransitivity of international MF flows is driven by several factors. First, high-flow and high-return periods tend to be synchronized across the US and other domiciles. Time fixed-effects eliminates the effect. Second, domicile flows are associated with macro-economic conditions and market liquidity measures that are also associated with US MF flows. Controlling for these variables corrects for this confounding influence on domicile flows. Last, a comparison of our results with the published literature confirms that fund-level patterns of associations between flows and performance do not necessarily scale to the domicile -level, thereby weakening the links between domicile flows, domicile returns, US returns, and US flows that may otherwise be expected.

2. Related literature and hypothesis development

2.1. A≈ B: The relationship between non-US MF flows and non-US MF returns

The first link in the intransitivity of international MFs is how non-US MF flows are associated with non-US MF returns, a relationship which we designate as $A \approx B$. At the international level, the literature favors a positive-feedback trading hypothesis when it comes to the relationship between domicile MF flow and lagged MF return. Oh and Parwada (2007) show that aggregate Korean MF flows represent negative feedback trading, at least with respect to volatility levels. That is, Korean equity fund managers tend to increase stock purchases in times of rising market volatility, and to sell in times of wide dispersion in investor beliefs. However, Jinjarak et al. (2011) and Froot et al. (2001) find support for positive-feedback trading for much larger datasets, with a positive association between current net inflows and contemporaneous and past market returns at both regional and country level. Ko et al. (2014) provide similar results using a sample from Chinese equity MFs, while Kaminsky, Lyons and Schmukler (2004) present corresponding evidence for MFs in emerging markets. Herding behaviors based on positive feedback are documented by Hsieh et al. (2011) for emerging Asian countries; Walter and Weber (2006) and Frey et al. (2014) for German MFs; Wylie (2005) for UK funds; Lobao and Serra (2007) for Portuguese MFs; and Voronkova and Bohl (2005) for Polish pension funds.

Another strand of literature supports the price pressure hypothesis when it comes to the positive association between lagged MF flow and contemporaneous market or security returns. Ben-Rephael, Kandel, and Wohl (2011) find strong support for price pressure for Israeli MFs and Alexakis, Dasilas, and Grose (2013) find similar results between stock prices and MF units in Japan. With a wider sample of institutional flows, Froot et al. (2001) show that even though the result is not statistically significant, flows predict negative future equity returns, a result which suggests evidence of overreaction or price pressure for developed markets. In a separate study about financial panics, Jinjarak and Zheng (2010) also demonstrate that the predictive power of flow on return is driven by a combination of price pressure and information effects in tranquil periods, while the information effect dominates in financial panics. More evidence from the Greek market by Alexakis et al. (2005) confirms the bidirectional causality between MF flows and stock returns. This is because in Greece, equity MF are obliged by law to invest a certain percentage of their cash in stocks. As a result, inflows and outflows of cash in equity funds seem to cause higher and lower stock returns in the Greek stock market.

The existing literature on MF flow-performance provides us with one benchmark null hypothesis with which to judge the patterns in a cross-domicile flow-return relationship. First, we confirm whether the previously documented positive association between MF flow and return also applies for our worldwide sample of non-US MFs[9]:

$H1_0$: Non-US MF flows are unrelated to non-US domicile returns.

Hypothesis 1 allows us to expand the previously documented tests of Ferreira et al. (2012) of cross-domicile flow-return associations to our data on MF returns, our sample period, our sample of countries, and with our measures of aggregate world and domicile returns.

2.2.B≈ C: The relationship between non-US MF returns and US MF returns

There exists a rich literature on positive association between non-US domicile market returns and US market returns. We examine this association in the context of the MF market and designate the expected relationship between non-US MF returns and US MF returns as $B \approx C$. Lee and Rui (2002) investigate the relationship between trading volume and return in the three largest stock markets (New York, Tokyo, and London), and find that US returns have extensive predictive power for UK and Japanese returns. Bekaert et al. (2009) show that there is evidence of an upward trend over time in domicile return correlations in Europe and a weak upward trend in the correlations between the US and European countries. Rapach et al. (2013) shows that lagged US

[9] In the literature cited above we have distinguished between papers with an explicit MF focus and papers with a more general focus on equity market returns or overall capital flows. In our hypotheses and analyses that follow, we are referring exclusively to MF flows and MF returns in all references to flows and returns, unless otherwise stated. Likewise, we are referring exclusively to non-US countries in all references to "domicile", unless otherwise stated.

returns significantly predict returns in numerous non-US industrialized countries, while lagged non-US returns display limited predictive ability with respect to US returns. In addition, there is an extensive literature discussing the leading role of the US market relative to other markets.

Nguyen (2022) confirms a widespread significant positive association when it comes to domicile MF returns and US MF returns. All the sample countries in Nguyen (2022) show a positive and significant relationship between local MF returns and US MF returns. The magnitude is stronger for current US return than with lagged US returns: although 100% of sample countries have a positive relationship with concurrent US returns, only 46.67% show a positive significant relation with lagged US return. Therefore, the strength of the relationship between US and non-US MF returns does depend on the time series properties of the model used. As the $B \approx C$ association is well established in the literature, we do not test it as a formal hypothesis.

2.3.C≈ D: The association between US MF returns and US MF flows

There exists an extensive literature on the relationship between MF returns and lagged MF flow for the US. Much of this work distinguishes between a price pressure effect of expected flows and an information effect driven by the informational component of unexpected flows. For example, Warther (1995) and Fant (1999) find evidence of a negative association between returns and some measures of lagged monthly flows, although Edwards and Zhang (1998) and Rakowski and Wang (2008) find no association in monthly data. Edelen and Warner (2001) show that daily returns are positively associated with concurrent daily flow via price pressure.

Coval and Stafford (2007) examine MF-driven fire sales in US equity markets. They find that funds experiencing large outflows tend to decrease existing positions, which creates price pressure in the securities held in common by distressed funds and funds experiencing large inflows to expand existing positions creates positive price pressure in overlapping holdings. Lou (2012) decomposes US MF flow into expected and unexpected components and finds that expected part of flow-induced trading positively predicts stock and MF returns in the next year. He concludes that expected part of US MF flow can help to explain the performance persistence and smart money effect (return predictability of MF) but only partially explain stock price momentum.

Using predictive variables (dividend-price ratio, default spread, consumption-wealth ratio, relative T-Bill rate) to describe the variation of unexpected fund flows, Jank (2012) finds those variables explain up to 51.7% compared with 40.8% from stock market return. He also observes that market returns are correlated with unexpected flows but are uncorrelated with expected flows. From the behavioral perspective, after decomposing fund flow into expected and unexpected flow using weekly data, Indro (2004) finds a similar strong positive relationship between unexpected fund flow in the previous two weeks and the size premium, which indicates that small firm returns are more sensitive to unexpected fund flow. Rakowski, Diltz, and Nguyen (2021) identify price pressure and informational effects of MF flows to cross-listed stocks. Dividing aggregate net purchases of U.S. corporate equities into seven investment groups, Boyer and Zheng (2009) find that the quarterly contemporaneous relations between returns and flows are positive and significant for MF and Foreign Investors, which are mainly due to the unexpected component of cash flows for these two investor groups. From those strands of literature, there is mixed evidence about how MF returns are associated with lagged MF flow.

2.4.A≈ D: Linking domicile flows to US flows

The literature cited above suggests several potential gaps in the link between domicile MF flows and US flows. Nguyen (2022) finds that the relationship between domicile flows and US flow is weak, with only three (Australia, Canada, and the UK) out of forty-four countries demonstrating a significant positive association with US MF flow. Much of the published research suggests that expected and unexpected flows, as well as domicile -specific return patterns, lead to inconsistencies in results for the associations between flows and returns, both within the US and across countries. To test the aspect arising from domicile -specific return patterns, we decompose non-US domicile returns into a systematic (i.e., US) return component and an idiosyncratic domicile-specific component. We test how domicile-level flows are associated with each component:

$H2_0$: Domicile MF flows are unrelated to idiosyncratic component of domicile MF returns.

A rejection of hypothesis 2 would provide an explanation for intransitivity by demonstrating segmentation of the market for asset management, even if financial markets overall are well integrated, as tested by hypothesis 1.

To examine the importance of expected and unexpected MF flows in explaining intransitivity, we follow Warther (1995), Fant (1999), Edelen and Warner (2001), and Lou (2012), and decompose US MF flows into expected and unexpected components:

$H3a_0$: Domicile MF flows are unrelated to expected component of US MF flow.

$H3b_0$: Domicile MF flows are unrelated to unexpected component of US MF flow.

A failure to reject the null for hypothesis 3b would be consistent with the intransitivity of international MF flows stemming from a complete segmentation in terms of liquidity across MF domiciles and implying that correlation between non-US MFs and US MF returns is due solely to information spillovers across markets. Rejection of null hypothesis 3b would refine our knowledge of how information and liquidity in the asset management industry spillover across markets by demonstrating that liquidity shocks to assets under management in one MF market can spillover to other markets even when spillovers from expected MF flows are segmented (Nguyen 2022).

3. Data and model development

3.1. Sample Construction

We use the same sample as Nguyen (2022). We require at least 12 continuous months of valid data for a domicile to be included in the sample. The sample consists of monthly information about flows, returns, and TNAs for 60 countries from February 1996 to June 2020. Our four main variables of interest are listed in Panel B of Table 1 of Nguyen (2022): world flows, US flows, domicile return, and US return. World flow and world return are constructed as the TNA-weighted average monthly flow and return, respectively, across all countries, excluding the US or domicile *i*, with valid domicile flows and returns each month. Reported statistics are then averaged over all sample months.

Our analysis employs control variables from the World Bank (World Development Indicator and Global Economic Monitor), DataStream, Federal Reserve Economic Data (FRED) website Pacific Exchange Rate Services (https://Exchange rate stability.sauder.ubc.ca/data.html). Jank (2012) shows that macroeconomic variables are associated with MF flows in the US. There is ample evidence suggesting that macroeconomic variables can be correlated across markets (Obstfeld, Rogoff, and Rogoff, 1996). Because of the potential correlation of macroeconomic variables across countries, and the conflicting evidence as to the association between macroeconomic variables and MF flows, we include a range of macroeconomic variables as controls without *a priori* hypothesis as to their direction or magnitude. Our control variables include measures of GDP growth, GDP per capita, inflation, and exchange rate stability.

The World Development Indicators (WDI) database is the primary World Bank collection of development indicators, compiled from officially recognized international sources. It presents the most current and accurate global development data available and includes national, regional, and global estimates. We obtain annual data from WDI for GDP growth (in percentage), GDP per capita (in US dollar), and inflation (in percentage). Based on the description from the WDI database, GDP growth is the annual percentage growth rate of GDP at market prices based on constant local currency while GDP per capita is gross domestic product divided by midyear population. Inflation is measured as the annual growth rate of the GDP implicit deflator shows the rate of price change in the economy. For the data for exchange rate stability, we use both DataStream and Pacific Exchange Rate Services to get the monthly exchange rate for all countries in our sample.

Measures of exchange rate stability feature prominently in research on cross- domicile fund flows but may be less important with our focus on within-domicile flows. When available, we measure exchange rate stability by the percentage monthly change in real trade-weighted effective exchange rates. If real effective trade-weighted exchange rates are unavailable, then we compute effective exchange rates against a broad basket of major currencies to compute the monthly percentage change in exchange rates. If this is unavailable, we use the percentage change in the exchange rate relative to the US dollar.

3.2.The components of intransitivity

Taking non-US MF flows as *A*, non-US MF returns as *B*, US MF returns as *C*, and US MF flows as *D*, then we have the following equations to test:

$A \approx B$: Domicile MF flows ≈ Domicile MF returns:

$$Domicile\ flow_{i,t} = \alpha_i + \beta_i\ Domicile\ return_{i,t-1} + \boldsymbol{X_{i,t-1}\psi} + \varepsilon_{i,t}\ , \qquad (2)$$

$A \approx C$: Domicile MF flows ≈ US MF returns

$$Domicile\ flow_{i,t} = \gamma_i + \delta_i\ US\ return_{i,t-1} + \boldsymbol{X_{i,t-1}\psi} + \varepsilon_{i,t}\ , \qquad (3)$$

$A \approx D$: Domicile MF flows ≈ US MF flows

$$Domicile\ flow_{i,t} = \zeta_i + \eta_i\ US\ flow_{i,t-1} + \boldsymbol{X_{i,t-1}\psi} + \varepsilon_{i,t}\ , \tag{4}$$

$B \approx C$: Domicile MF returns ≈ US MF returns

$$Domicile\ return_{i,t} = \theta_i + \kappa_i\ US\ return_{i,t-1} + \boldsymbol{X_{i,t-1}\psi} + \varepsilon_{i,t}\ , \tag{5}$$

$B \approx D$: Domicile MF returns ≈ US MF flows

$$Domicile\ return_{i,t} = \lambda_i + \mu_i\ US\ flow_{i,t-1} + \boldsymbol{X_{i,t-1}\psi} + \varepsilon_{i,t}\ , \tag{6}$$

C ≈ D: US MF returns ≈ US MF flows

$$US\ return_t = \nu_i + \xi_i\ US\ flow_{t-1} + \boldsymbol{X_{i,t-1}\psi} + \varepsilon_{i,t}\ , \tag{7}$$

where $\boldsymbol{X_{i,t}}$ represents a vector of macro-economic control variables for each domicile *i* in month *t-1*: GDP growth, GDP per capita, inflation, and exchange rate stability. $\boldsymbol{\psi}$ is a vector of coefficient estimates on control variables.

We focus on equations (2), (4), (5), and (7), as these illustrate the most important links in the intransitivity chain. For each equation, we use four different specifications: (a) pooled OLS without control variables, (b) panel regression with domicile fixed effects and no control variables, (c) OLS regression with control variables, and (d) panel regression with domicile fixed effects and control variables. Estimates of equation (4) provide an initial characterization of intransitivity in our sample. Estimates of equation (2) provide a test of H1.

We estimate all models with one lag of the independent variables. Appendix A reports an expanded analysis of the time series dynamics between flows and returns of auto-regressive (AR) models with multiple lags. The AR analysis reported in Appendix A indicates that models with one lag are well specified for the analysis reported in the text.

3.3.Modeling systematic and idiosyncratic components of flow and returns

In this section, we build models to test H2, H3a, and H3b. First, we decompose domicile returns into a US component and idiosyncratic component for each domicile:

$$Domicile\ return_{i,} = \alpha_i + \beta_i US\ MF\ return_{i,t-1} + \varepsilon_{US\ MF\ return\ i,t}\ . \quad (8)$$

Taking the US market as the benchmark, we designate the predicted value from equation (8) as the *domicile systematic return* and the residual term of equation (8) as the *domicile idiosyncratic return*. We then estimate:

$$\begin{aligned} Domicile\ flow_{i,t} &\quad (9) \\ = \alpha_i + \beta_{1i} domicile\ systematic\ return_{i,t-1} & \\ + \beta_{2i}\ domicile\ idiosyncratic\ return_{i,t-1} + \varepsilon_{i,t} & \end{aligned}$$

Equation (9) tests H2: rejection of the null for H2b implies a significant estimate for β_{2i}. Next, we take the component of US flow that is orthogonal to US returns and designate it as the unexpected component of US flow:

$$US\ MF\ flow_{i,t} = \alpha_i + \beta_i US\ MF\ return_{i,t-1} + \varepsilon_{US\ MF\ return\ i,t}\ . \quad (10)$$

The predicted value from equation (10) measures the *expected component of US flow* and the residual term of equation (10) measures the *unexpected component of US flow*.

Taking the residual from equation (8) along with predicted value and residual term from equation (10), we estimate an expanded model to explain domicile level flows:

$$\begin{aligned} Domicile\ flow_{i,t} = \alpha_i + \beta_{1i}\ domicile\ idiosyncratic\ return_{i,t-1} + \quad (11) \\ \beta_{2i} expected\ component\ of\ US\ flow_{i,t-1} + \\ \beta_{3i} unexpected\ component\ of\ US\ flow_{i,t-1} + \boldsymbol{X_{i,t-1}\psi} + \varepsilon_{i,t}\ . \end{aligned}$$

Equation (11) expands the scope of equation (9) by reexamining the result for hypothesis 2 and 3: β_{1i} tests H2, β_{2i} tests H3a, and β_{3i} tests H3b.

4. Estimation results

Table 2 reports the relationship between past domicile return and contemporaneous domicile flow (equation 2). We observe only a positive and significant association between past return and current flow at international level only when we do not consider domicile effects or controls variables (first column). Ferreira et al. (2012) studies how mutual fund flows depend on past performance across 28 domiciles and confirm the flow-performance relationship with their quarterly fund-level data. When they do not include the domicile fixed effects, their results are also weaker. When we introduce the domicile fixed effect in second column, we can see the marginal impact of correcting for the overall level of flows and returns in each domicile. The relationship between past return and current flow is still positive but no longer significant. In addition, the control variables in columns three and four weaken the relationship and mediate much of the association in column one between past return and current flow. This means lagged one-month returns are associated with control variables such as GDP growth rate, market capitalization, inflation rate, and currency exchange of the same month and those control variables help to predict the domicile flow of the following month. We reject the null hypothesis #1 that domicile MF flows are unrelated to domicile returns and conclude that past domicile returns are positively associated with domicile MF flows.

Table 3 reports the relationship between past US MF return and the contemporaneous domicile return (equation 5). The results are robust across all specifications: US returns predict other domiciles' returns, with or without controlling for domicile fixed effects and macro control variables. This aligns with the findings of prior literature on international cross-market return dynamics. In equity markets, Rapach et al. (2013) find that lagged US returns significantly predict returns in numerous non-US industrialized countries, while lagged non-US returns display limited predictive ability with respect to US returns. Nguyen (2022) confirms similar findings for an international mutual fund sample.

Table 4 reports the relationship between past US MF flow and contemporaneous US return (equation 7). We do not find evidence that aggregate US flows predict US aggregate returns. This is different from fund level studies in US. Frazzini and Lamont (2008) measures mutual fund flows as individual investor sentiment proxy and find that high sentiment (high flow) helps to predict low future returns. Greene and Hodges (2002) also find a negative impact from daily fund flows to future returns. Only in the REIT mutual fund industry, Ling and Naranjo (2006) find evidence that REIT mutual fund flows are positively and significantly related to prior returns, while prior REIT mutual fund flows do not significantly influence REIT returns. Out findings are consistent with Warther (1995) and Fant (1999) at the aggregate level. Warther (1995) confirms the positive correlation between past US flow and the subsequent US return for mutual fund (an unexpected inflow equal to 1% of total stock fund assets corresponds to a 5.7% increase in the stock price index). Fant (1999) breaks down the aggregate fund flows into four components and confirms Warther's finding only for exchange-in and out, but not for new sales or redemptions.

Table 5 reports the direct relationship between past US flow and subsequent domicile flow (equation 4). Across all specifications, the results are robust that past US flows are unrelated to future domicile flows, regardless of controls for domicile fixed effects and macro-economic and market liquidity variables. This confirms the presence of international fund flow intransitivity in our sample. Table 6 presents the results for the expanded intransitivity model given in equation 11. We observe a positive and significant association between current domicile flow and past *expected component of US flow* and past *domicile idiosyncratic return* only when we do not consider domicile effects or controls variables (first column of Table 6).

When we introduce the domicile fixed effect in second column of Table 6, we can see the marginal impact of correcting for the overall level of flows and returns in each domicile. The relationship between past *expected component of US flow* and past *domicile systematic return* are still positive but no longer significant. In addition, the control variables in columns three and four weaken the relationship and mediate much of the association in column one, like the effect from Table 2. This means the *expected component of US flow* and the *domicile systematic return* are associated positively with control variables such as GDP growth rate, market capitalization, and negatively with inflation rate, and share turnover rate of the same month. These control variables are associated with the domicile flow of the following month. When including the domicile fixed effects, only domicile-level market capitalization helps to predict the domicile flow.

Appendix A provides evidence that AR models yield similar inferences as the models reported in previous tables. Appendix A1 reports the results for one-month lag for 59 domiciles for equation 12 (not including the US) in Panel A. In Panel B, seventeen domiciles have significant coefficients for domicile returns and in Panel C, only Luxembourg and Denmark past flow has positive and significant relationship with concurrent US flow and show no significant association with its own domicile's return. Appendix Table A2 reports the results for three-month lag and the results remain similar. We proceed without AR adjustments to our estimates. In our appendix B, we present the domicile dyads estimates for equations (3), (4) and (6). Again, we do not find any significant relationship among domicile dyads components.

5. Conclusions

In this paper, we present a series of models with different specifications to examine the intransitivity relationship between domicile flows and US flow. Existing research has shown that a variety of domicile-level characteristics are associated with measures of equity market integration and segmentation. Therefore, we examine if domicile-level characteristics also explain variation in the integration or segmentation of the MF industry across domiciles, based on our measures of MF flow correlations relative to the US and the world. Literatures from cross domicile stock returns suggest the phenomenon of time-varying comovement of stock return is explained by a domicile's political risk profile and its stock market development (Bekaert and Harvey, 1995; Bekaert et al., 2009; Bekaert et al., 2011). Bekaert et al. (2011) also document the importance of one global factor, the US corporate credit spread, in their model to explain measurement of the world equity market segmentation (opposites term for what we consider "correlation").

We find that beside financial development of a domicile (measured by market capitalization), past domicile return, the predictable component of lagged US flows, and the idiosyncratic component of lagged domicile returns are positively associated with subsequent domicile flow when we ignore domicile fixed effect and control variables. On the other hand, beside past aggregate US flow and the unpredictable component of lagged US flows, past domicile return, the predictable component of lagged US flows and the idiosyncratic component of lagged domicile returns are unrelated to subsequent domicile flow when we consider domicile fixed effect and control variables. We conclude the role of domicile fixed effects and domicile-level control variables along with aggregation in MF at domicile level as the main culprits for the intransitivity relationship between domicile flows and US flow.

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Table 1: Descriptive statistic of domiciled-level sample data

The table reports summary statistics for monthly observations for 60 countries. Average TNA (in USD) and average return (in percentage) are provided by Morningstar, CRSP Mutual fund for US, and EPFR. Average flows are provided by EPFR and calculated for Morningstar and CRSP Mutual fund for US as $Flowt = TNA_t - TNA_{t-1} * (1+r_t)$ following Sirri and Tufano (1998). We aggregate TNA, returns, and flows across classes when there are multi share classes of a fund. We average flows across funds, weighted by TNA, for each domicile -month in order to get the domicile level aggregate flow, if this measure is not already provided. When fund flows are reported quarterly, we distribute these quarterly flows evenly over the three months of the quarter before aggregating at the domicile level. All returns, flows, and TNA are converted to US dollars if not already reported in US dollars.

Obs	Domicile	Number of Obs	Start month	End month	Average TNA	Average monthly return	Average annual return	Average flow
1	Andorra	107	2011-02	2019-12	804.42	0.06%	0.68%	-1.33%
2	Australia	168	2006-01	2019-12	95167.42	0.36%	4.28%	0.67%
3	Austria	219	2001-10	2019-12	17798.12	0.41%	4.86%	-0.04%
4	Bahamas	185	1997-07	2019-12	167.06	0.36%	4.31%	-0.96%
5	Bahrain	34	2006-11	2010-12	287.38	-1.88%	-22.56%	-1.86%
6	Belgium	287	1996-02	2019-12	20449.76	0.28%	3.34%	-0.22%
7	Brazil	108	2011-01	2019-12	3883.13	1.56%	18.70%	-1.25%
8	Bulgaria	48	2016-01	2019-12	107.01	0.01%	0.08%	0.25%
9	Canada	287	1996-02	2019-12	300661.71	0.23%	2.74%	-0.32%
10	China	81	2013-04	2019-12	31840.88	0.97%	11.65%	-0.42%
11	Czech	101	2011-04	2019-12	633.82	-0.19%	-2.33%	0.03%
12	Denmark	260	1998-05	2019-12	4813.78	0.40%	4.85%	-0.14%
13	Estonia	159	2006-01	2019-12	177.62	0.36%	4.32%	-0.78%
14	Finland	168	2006-01	2019-12	11550.32	0.01%	0.13%	-0.13%
15	France	273	1997-04	2019-12	257477.99	0.02%	0.21%	0.34%
16	Germany	218	2001-01	2019-12	149412.30	0.53%	6.32%	-0.34%
17	Gibraltar	95	2011-02	2019-12	59.74	-0.04%	-0.50%	-0.10%
18	Greece	108	2011-01	2019-12	272.15	0.27%	3.19%	-2.39%
19	Guernsey	107	2011-02	2019-12	10613.93	0.25%	2.99%	-1.07%
20	Hong Kong	266	1996-02	2019-12	17874.69	0.49%	5.88%	0.29%
21	Hungary	59	2011-02	2015-12	237.70	0.05%	0.63%	-2.16%
22	India	106	2011-01	2019-12	161567.87	1.03%	12.34%	0.07%
23	Indonesia	18	2017-07	2019-12	43.88	0.09%	1.07%	7.80%
24	Ireland	287	1996-02	2019-12	462283.90	0.28%	3.40%	0.61%
25	Isle of man	106	2011-02	2019-11	376.10	0.05%	0.56%	0.22%
26	Israel	67	2013-04	2018-10	23350.14	0.45%	5.41%	0.05%
27	Italy	108	2011-01	2019-12	143264.21	0.02%	0.18%	-0.68%
28	Japan	108	2011-01	2019-12	431367.62	0.75%	9.00%	0.25%
29	Korea	95	2012-02	2019-12	20223.83	0.12%	1.43%	1.09%
30	Kuwait	139	2008-04	2019-12	2411.90	-0.04%	-0.45%	-0.52%

Obs	Domicile	Number of Obs	Start month	End month	Average TNA	Average monthly return	Average annual return	Average flow
31	Liechtenstein	167	2006-01	2019-12	17235.81	-0.07%	-0.85%	-0.47%
32	Luxembourg	287	1996-02	2019-12	1088497.24	0.22%	2.64%	0.41%
33	Malaysia	93	2012-04	2019-12	394.64	0.57%	6.79%	0.35%
34	Malta	107	2011-02	2019-12	1133.78	0.16%	1.92%	-0.30%
35	Mauritius	275	1997-02	2019-12	1960.91	1.02%	12.30%	-0.17%
36	Mexico	108	2011-01	2019-12	3429.51	0.69%	8.27%	-1.14%
37	Monaco	107	2011-02	2019-12	829.27	0.06%	0.77%	0.44%
38	Netherlands	205	2002-01	2019-12	21760.33	0.07%	0.87%	-0.68%
39	New Zealand	143	2008-02	2019-12	1276.20	0.63%	7.53%	0.39%
40	Nigeria	47	2016-01	2019-12	14.16	0.38%	4.58%	-0.83%
41	Norway	106	2011-03	2019-12	36613.34	0.92%	11.00%	-0.45%
42	Pakistan	21	2018-04	2019-12	3172.62	1.53%	18.34%	-1.67%
43	Philippines	107	2011-02	2019-12	5794.58	0.19%	2.28%	1.06%
44	Portugal	59	2011-02	2015-12	4774.00	-0.40%	-4.82%	-0.28%
45	Qatar	37	2012-01	2015-11	93.88	0.87%	10.50%	-0.01%
46	Romania	48	2016-01	2019-12	2713.01	0.36%	4.35%	-0.95%
47	Russia	107	2011-02	2019-12	1875.69	0.40%	4.82%	0.69%
48	Saudi Arabia	106	2011-02	2019-12	8722.01	0.24%	2.94%	0.45%
49	Singapore	285	1996-02	2019-12	4477.03	0.09%	1.06%	-0.21%
50	Slovenia	80	2011-02	2019-12	516.10	0.02%	0.21%	-0.11%
51	South Africa	108	2011-01	2019-12	13712.24	1.39%	16.74%	-0.66%
52	Spain	108	2011-01	2019-12	53890.20	0.30%	3.60%	0.08%
53	Sweden	198	2001-01	2019-12	75917.90	0.83%	9.95%	0.65%
54	Switzerland	287	1996-02	2019-12	139602.12	0.06%	0.71%	-0.17%
55	Taiwan	108	2011-01	2019-12	7700.08	0.36%	4.28%	1.24%
56	Thailand	84	2013-01	2019-12	53993.61	0.16%	1.89%	-0.13%
57	Turkey	153	2007-04	2019-12	73.58	1.95%	23.36%	-1.12%
58	UAE	107	2011-02	2019-12	607.08	0.48%	5.78%	-0.92%
59	UK	287	1996-02	2019-12	368449.89	0.49%	5.90%	0.03%
60	USA	287	1996-02	2019-12	12094298.33	0.50%	6.00%	0.31%

Table 2: Domicile MF flows ≈ Domicile MF returns component

This table reports panel analysis with four different specifications of the following model:

$$\textit{Domicile flow}_{i,t} = \alpha_i + \beta_i \textit{Domicile return}_{i,t-1} + \boldsymbol{X_{i,t-1}\psi} + \varepsilon_{i,t.} \quad (2)$$

The first column reports OLS regression coefficients without control variables; the second column reports estimates with domicile fixed effects; the third column reports OLS estimates with control variables; and the fourth column reports estimates with domicile fixed effects and control variables. $\boldsymbol{X_{i,t}}$ represents a vector of macro-economic control variables for each domicile *i* in month *t-1*: GDP growth, GDP per capita, inflation, and exchange rate stability. $\boldsymbol{\psi}$ is a vector of coefficient estimates for each domicile *i*. Heteroskedasticity and autocorrelation consistent *t*-statistics, clustered by domicile, are reported in parentheses below the coefficient estimate. * significant at 10%. ** significant at 5%. *** significant at 1%.

Intercept	-0.00105**	0.002718***	-0.05364***	-0.01295
	(-1.94)	(21.58)	(-4.12)	(-0.16)
Domicile $\text{return}_{i,t-1}$	0.02904***	0.032299	-0.0095	-0.01027
	(2.59)	(1.12)	(-0.67)	(-0.29)
$\text{GDPcapital2010}_{t-1}$			0.00017436	-0.02739
			(0.23)	(-1.57)
GDPgrowth_{t-1}			0.05834***	0.011558
			(2.78)	(0.43)
Inflation_{t-1}			-0.04943**	-0.03285
			(-2.46)	(-1.10)
MarketCap_{t-1}			0.00196***	0.010331**
			(4.62)	(2.03)
$\text{Shareturnover}_{t-1}$			-0.00485***	-0.00224
			(-3.81)	(-0.89)
Exchange rate stability_{t-1}			-0.0025	-0.01711
			(-0.07)	(-0.36)
R^2	0.10%	2.20%	0.76%	2.73%
Domicile Fixed effect	No	Yes	No	Yes
N (domicile -months)	6556	6510	5279	5233

Table 3: Domicile MF returns ≈ US MF returns

This table reports panel analysis with four different specifications of the following model:

$$Domicile\ return_{i,t} = \theta_i + \kappa_i \quad US\ return_{\ i,t-1} + \boldsymbol{X_{i,t-1}\psi} + \varepsilon_{i,t.} \qquad (5)$$

The first column reports OLS regression coefficients without control variables; the second column reports estimates with domicile fixed effects; the third column reports OLS estimates with control variables; and the fourth column reports estimates with domicile fixed effects and control variables. $\boldsymbol{X_{i,t}}$ represents a vector of macro-economic control variables for each domicile *i* in month *t-1*: GDP growth, GDP per capita, inflation, and exchange rate stability. $\boldsymbol{\psi}$ is a vector of coefficient estimates for each domicile *i*. Heteroskedasticity and autocorrelation consistent *t*-statistics, clustered by domicile, are reported in parentheses below the coefficient estimate. * significant at 10%.** significant at 5%.*** significant at 1%.

Intercept	0.00315**	0.003768***	-0.01301	-0.04779
	(5.21)	(28.24)	(-1.00)	(-0.8)
US return$_{i,t-1}$	0.18215***	0.182804***	0.1314***	0.103689***
	(7.12)	(5.97)	(4.86)	(4.40)
GDPcapital2010$_{t-1}$			-0.00207***	-0.01428
			(-2.72)	(-0.84)
GDPgrowth$_{t-1}$			-0.01816	-0.03371*
			(-0.87)	(-1.78)
Inflation$_{t-1}$			0.02514	-0.03073
			(1.25)	(-1.08)
MarketCap$_{t-1}$			0.00155***	0.007505
			(3.67)	(1.53)
Shareturnover$_{t-1}$			-0.00603***	-0.01322***
			(-4.73)	(-3.83)
Exchange rate stability$_{t-1}$			0.03224	0.034244
			(0.91)	(1.24)
R^2	0.77%	1.51%	1.21%	4.42%
Domicile Fixed effect	No	Yes	No	Yes
N (domicile -months)	6556	6510	5279	5233

Table 4: US MF returns ≈ US MF flows

This table reports panel analysis with two different specifications of the following model:

$$US\ return_t = \nu_i + \xi_i US\ flow_{t-1} + \boldsymbol{X_{i,t-1}\psi} + \varepsilon_{i,t} \quad (7)$$

The first column reports OLS estimates; the second column reports estimates with control variables. $\boldsymbol{X_{i,t}}$ represents a vector of macro-economic control variables for each domicile *i* in month *t-1*: GDP growth, GDP per capita, inflation, and exchange rate stability. $\boldsymbol{\psi}$ is a vector of coefficient estimates. Heteroskedasticity and autocorrelation consistent *t*-statistics, clustered by domicile, are reported in parentheses below the coefficient estimate. * significant at 10%.** significant at 5%.*** significant at 1%.

Intercept	0.00534***	0.48951
	(3.00)	(1.45)
US $flow_{i,t-1}$	-0.26888	-0.42576
	(-0.87)	(-1.29)
US $GDPcapital2010_{t-1}$		-0.11949
		(-1.64)
US $GDPgrowth_{t-1}$		-0.09859
		(-0.70)
US $Inflation_{t-1}$		-0.02105
		(-0.07)
US $MarketCap_{t-1}$		0.02662
		(1.59)
US $Shareturnover_{t-1}$		-0.00301
		(-0.79)
US Exchange rate $stability_{t-1}$		-0.26418**
		(-2.06)
R^2	0.29%	6.97%
Domicile Fixed effect	No	No
N (months)	263	263

Table 5: Domicile MF flows ≈ US MF flows

This table reports panel analysis with four different specifications of the following model:

$$Domicile\ flow_{i,t} = \zeta_i + \eta_i\ US\ flow_{t-1} + \boldsymbol{X_{i,t-1}\psi} + \varepsilon_{i,t} \quad (4)$$

The first column reports OLS regression coefficients without control variables; the second column reports estimates with domicile fixed effects; the third column reports OLS estimates with control variables; and the fourth column reports estimates with domicile fixed effects and control variables. $\boldsymbol{X_{i,t}}$ represents a vector of macro-economic control variables for each domicile *i* in month *t-1*: GDP growth, GDP per capita, inflation, and exchange rate stability. $\boldsymbol{\psi}$ is a vector of coefficient estimates for each domicile *i*. Heteroskedasticity and autocorrelation consistent *t*-statistics, clustered by domicile, are reported in parentheses below the coefficient estimate. * significant at 10%. ** significant at 5%. *** significant at 1%.

Intercept	-0.00080244	0.003202	-0.05362***	-0.00488
	(-1.32)	(1.00)	(-4.12)	(-0.06)
US $flow_{i,t-1}$	-0.06183	-0.11839	-0.05005	-0.09999
	(-0.50)	(-1.07)	(-0.34)	(-0.69)
$GDPcapital2010_{t-1}$			0.0002158	-0.028
			(0.28)	(-1.54)
$GDPgrowth_{t-1}$			0.0586***	0.012628
			(2.79)	(0.47)
$Inflation_{t-1}$			-0.04936**	-0.03163
			(-2.45)	(-1.09)
$MarketCap_{t-1}$			0.00194***	0.010275*
			(4.59)	(1.92)
$Shareturnover_{t-1}$			-0.00476***	-0.00197
			(-3.74)	(-0.75)
Exchange rate $stability_{t-1}$			0.00358	-0.00997
			(0.10)	(-0.23)
R^2	0.00%	2.09%	0.75%	2.73%
Domicile Fixed effect	No	Yes	No	Yes
N (domicile -months)	6556	6510	5279	5233

Table 6: Cross- domicile flow relationships related to market component of and idiosyncratic component of returns and flows

This table reports panel analysis with four different specifications of the following model: *Domicile flow*$_{i,t}$= α_i+ β_{1i} *domicile idiosyncratic return*$_{i,t-1}$ + β_{2i} *expected component of US flow*$_{i,t-1}$ + β_{3i} *unexpected component of US flow*$_{i,t-1}$+$\boldsymbol{X_{i,t-1}\psi}$ + $\varepsilon_{i,t}$ (11)

The first column reports OLS regression coefficients without control variables; the second column reports estimates with domicile fixed effects; the third column reports OLS estimates with control variables; and the fourth column reports estimates with domicile fixed effects and control variables. $\boldsymbol{X_{i,t}}$ represents a vector of macro-economic control variables for each domicile *i* in month *t-1*: GDP growth, GDP per capita, inflation, and exchange rate stability. $\boldsymbol{\psi}$ is a vector of coefficient estimates for each domicile *i*. Heteroskedasticity and autocorrelation consistent *t*-statistics, clustered by domicile, are reported below beta coefficient. * significant at 10%.** significant at 5%.*** significant at 1%.

Intercept	-0.00624***	-0.00458	-0.05307***	-0.00584
	(-3.49)	(-0.65)	(-3.73)	(-0.07)
Domicile idiosyncratic returns$_{i,t-1}$	0.03598***	0.036128	-0.00333	-0.00639
	(3.16)	(1.23)	(-0.23)	(-0.17)
Expected component of US flow$_{i,t-1}$	2.37555***	2.567566	0.09341	0.279682
	(3.12)	(1.05)	(0.09)	(0.10)
Unexpected component of US flow$_{i,t-1}$	-0.14473	-0.14426	-0.03941	-0.07896
	(-1.14)	(-1.30)	(-0.26)	(-0.50)
GDPcapital2010$_{t-1}$			0.00015552	-0.02864
			(0.17)	(-1.58)
GDPgrowth$_{t-1}$			0.05856***	0.012928
			(2.75)	(0.47)
Inflation$_{t-1}$			-0.04923**	-0.03198
			(-2.44)	(-1.07)
MarketCap$_{t-1}$			0.00193***	0.010499**
			(4.39)	(2.02)
Shareturnover$_{t-1}$			-0.00473***	-0.00201
			(-3.66)	(-0.80)
Exchange rate stability$_{t-1}$			-0.00497	-0.02217
			(-0.14)	(-0.46)
R^2	0.31%	2.32%	0.75%	2.77%
Domicile Fixed effect	No	Yes	No	Yes
N (domicile -months)	6519	6473	5269	5223

ONLINE APPENDIX A

In this appendix, we examine how cross-domicile MF flows are associated with both returns and MF flows to provide a more robust test for H1. At the domicile level we report autoregressive (AR) models to determine the optimal specification to model the time series structure of domicile flow, domicile return and US flow:

$$Domicile\ flow_{i,t} = \alpha_i + \sum_{m=1}^{3} \beta_{m,i}\ Domicile\ return_{i,t-m} + \sum_{n=1}^{3} \beta_{n,i}\ US\ flow_{i,t-n} + \varepsilon_{i,t}\ , \quad \text{(A1)}$$

with i = domicile 1 to 59 and m and n represent number of lags (up to 3) in domicile returns and US flows, respectively. Our AR models are estimated for each domicile, allowing us to examine the generalizability of existing research on the lead-lag relationships between flows and returns for the US (Rakowski and Wang, 2009; Edelen and Warner, 2001; Babalos et al., 2015), and other countries (Griffin et al., 2004; Kopsch et al., 2015; Qureshi et al., 2019).

Table A1: Equation (3) with AR=1 by domiciles

This table reports domicile betas, *t*-statsistic, R^2, number of months from our AR analysis in equation (12):

$$Domicile\ flow_{i,t-1} = \alpha_i + \sum_{m=1}^{3} \beta_{1m,i}\ Domicile\ return_{m,i,t} + \sum_{m=1}^{3} \beta_{2m,i}\ US\ flow_{m,i,t} + \varepsilon_{i,t} \quad (A1)$$

with i= domicile 1 to 59. All returns, flows, and TNA are converted to US dollars if not already reported in US dollars. N reports the number of monthly observations across domiciles.

Panel A: For 59 domiciles

#	Domicile	β_{1i}	*t*-statistic	β_{2i}	*t*-statistic	R^2	N
1	Andorra	0.12	0.69	-0.72	-0.73	1.3%	102
2	Australia	0.25	3.19	0.71	0.96	5.7%	163
3	Austria	0.11	1.93	0.76	1.45	5.4%	214
4	Bahamas	-0.30	-2.26	1.21	0.61	3.0%	180
5	Bahrain	0.03	0.37	-1.54	-1.18	28.2%	29
6	Belgium	-0.02	-0.49	0.17	0.37	9.1%	282
7	Brazil	0.53	3.00	3.03	1.83	10.3%	103
8	Bulgaria	-0.49	-2.43	0.17	0.25	4.1%	43
9	Canada	0.06	1.83	-0.01	-0.03	1.1%	282
10	China	-0.20	-2.10	0.67	0.46	5.0%	76
11	Czech	0.13	2.56	-0.47	-1.26	23.1%	96
12	Denmark	0.04	0.89	1.10	2.41	3.3%	255
13	Estonia	0.15	1.09	0.65	0.51	8.7%	154
14	Finland	0.07	0.96	0.33	0.33	1.9%	163
15	France	0.10	2.15	0.27	0.58	4.3%	268
16	Germany	0.04	0.90	0.73	1.69	1.8%	213
17	Gibraltar	0.09	0.64	-0.33	-0.32	1.0%	90
18	Greece	0.38	2.24	1.12	1.12	19.3%	103
19	Guernsey	0.10	1.23	-0.28	-0.62	2.7%	102
20	Hong Kong	-0.16	-2.28	1.10	1.21	4.2%	261
21	Hungary	0.06	0.30	0.57	0.29	3.2%	54
22	India	0.23	1.21	0.99	0.91	9.9%	101
23	Indonesia	-4.67	-1.11	-0.53	-0.02	8.7%	13
24	Ireland	0.02	0.49	0.26	0.98	10.0%	282
25	Isle of man	0.49	1.29	0.98	0.39	2.0%	101
26	Israel	0.14	1.50	-0.74	-0.78	3.7%	62
27	Italy	0.01	0.07	0.62	1.49	2.3%	103
28	Japan	0.17	2.88	0.34	0.48	10.8%	103
29	Korea	0.54	3.08	0.16	0.14	9.2%	90
30	Kuwait	-0.05	-1.03	0.40	1.05	1.6%	134

#	Domicile	β_{1i}	*t*-statistic	β_{2i}	*t*-statistic	R^2	N
31	Liechtenstein	0.00	0.01	-0.20	-0.42	6.8%	162
32	Luxembourg	0.00	-0.06	0.42	2.01	11.6%	282
33	Malaysia	-0.29	-0.92	-0.48	-0.30	1.1%	88
34	Malta	0.11	0.90	0.60	0.74	2.6%	102
35	Mauritius	0.04	1.57	0.06	0.15	14.8%	270
36	Mexico	0.47	2.36	3.10	1.94	7.1%	103
37	Monaco	0.05	0.86	-0.11	-0.30	21.4%	102
38	Netherlands	0.01	0.12	1.01	1.48	2.0%	200
39	New Zealand	0.29	3.73	-0.62	-0.80	6.6%	138
40	Nigeria	-0.12	-1.28	0.34	0.32	5.6%	42
41	Norway	-0.03	-0.25	0.35	0.36	0.7%	101
42	Pakistan	0.00	0.01	0.70	0.45	5.3%	16
43	Philippines	0.14	1.08	0.23	0.40	47.4%	102
44	Portugal	0.00	-0.19	-0.05	-0.15	35.5%	54
45	Qatar	0.09	0.77	1.11	0.73	4.5%	32
46	Romania	0.12	0.87	0.61	1.05	8.5%	43
47	Russia	-0.08	-1.44	0.14	0.25	30.6%	102
48	Saudi Arabia	-0.30	-1.24	-0.96	-1.01	2.1%	101
49	Singapore	-0.01	-0.22	0.15	0.46	1.5%	280
50	Slovenia	-0.10	-2.38	-0.10	-0.29	8.1%	75
51	South Africa	0.36	5.61	1.78	1.80	13.5%	103
52	Spain	0.31	2.66	0.76	1.07	6.1%	103
53	Sweden	0.06	0.76	0.23	0.25	1.0%	193
54	Switzerland	0.12	3.51	0.22	0.72	4.1%	282
55	Taiwan	0.30	0.87	-3.90	-1.46	4.1%	103
56	Thailand	0.42	1.74	0.15	0.21	8.2%	79
57	Turkey	0.03	0.21	0.63	0.36	0.1%	148
58	UAE	-0.04	-0.63	0.79	1.24	8.3%	102
59	UK	0.02	0.88	0.55	1.95	2.0%	282

Panel B: For domiciles with significant relationship with domicile return						
Domicile	**β_{1i}**	***t*-statistic**	**β_{2i}**	***t*-statistic**	**R^2**	**N**
Bulgaria	-0.49	-2.43	0.17	0.25	4.1%	43
Slovenia	-0.10	-2.38	-0.10	-0.29	8.1%	75
Hong Kong	-0.16	-2.28	1.10	1.21	4.2%	261
Bahamas	-0.30	-2.26	1.21	0.61	3.0%	180
China	-0.20	-2.10	0.67	0.46	5.0%	76
France	0.10	2.15	0.27	0.58	4.3%	268
Greece	0.38	2.24	1.12	1.12	19.3%	103
Mexico	0.47	2.36	3.10	1.94	7.1%	103
Czech	0.13	2.56	-0.47	-1.26	23.1%	96
Spain	0.31	2.66	0.76	1.07	6.1%	103
Japan	0.17	2.88	0.34	0.48	10.8%	103
Brazil	0.53	3.00	3.03	1.83	10.3%	103
Korea	0.54	3.08	0.16	0.14	9.2%	90
Australia	0.25	3.19	0.71	0.96	5.7%	163
Switzerland	0.12	3.51	0.22	0.72	4.1%	282
New Zealand	0.29	3.73	-0.62	-0.80	6.6%	138
South Africa	0.36	5.61	1.78	1.80	13.5%	103

Panel C: For domiciles with significant relationship with US flow						
Domicile	**β_{1i}**	***t*-statistic**	**β_{2i}**	***t*-statistic**	**R^2**	**N**
Luxembourg	0.00	-0.06	0.42	2.01	11.6%	282
Denmark	0.04	0.89	1.10	2.41	3.3%	255

Table A2: Equation (3) with AR=3 by domiciles

This table reports domicile betas, *t*-statistic, R^2, number of months from our AR analysis in equation (12):

$$Domicile\ flow_{i,t} = \alpha_i + \sum_{m=1}^{3} \beta_{1m,i}\ Domicile\ return_{i,t-m} + \sum_{n=1}^{3} \beta_{2n,i}\ US\ flow_{i,t-n} + \varepsilon_{i,t} \quad (A1)$$

with i= domicile 1 to 59. All returns, flows, and TNA are converted to US dollars if not already reported in US dollars. N reports the number of monthly observations across domiciles.

Panel A: For 59 domiciles

#	Domicile	β_{1i}	*t*-statistic	β_{2i}	*t*-statistic	R^2	N
1	Andorra	0.12	0.69	-0.72	-0.73	2.71%	100
2	Australia	0.25	3.19	0.71	0.96	6.42%	161
3	Austria	0.11	1.93	0.76	1.45	7.72%	212
4	Bahamas	-0.30	-2.26	1.21	0.61	3.43%	178
5	Bahrain	0.03	0.37	-1.54	-1.18	37.76%	27
6	Belgium	-0.02	-0.49	0.17	0.37	9.36%	280
7	Brazil	0.53	3.00	3.03	1.83	10.62%	101
8	Bulgaria	-0.49	-2.43	0.17	0.25	8.45%	41
9	Canada	0.06	1.83	-0.01	-0.03	1.67%	280
10	China	-0.20	-2.1	0.67	0.46	11.17%	74
11	Czech	0.13	2.56	-0.47	-1.26	32.75%	94
12	Denmark	0.04	0.89	1.10	2.41	6.69%	253
13	Estonia	0.15	1.09	0.65	0.51	15.28%	152
14	Finland	0.07	0.96	0.33	0.33	2.68%	161
15	France	0.10	2.15	0.27	0.58	8.40%	266
16	Germany	0.04	0.90	0.73	1.69	3.32%	211
17	Gibraltar	0.09	0.64	-0.33	-0.32	1.44%	88
18	Greece	0.38	2.24	1.12	1.12	22.14%	101
19	Guernsey	0.10	1.23	-0.28	-0.62	13.01%	100
20	Hong Kong	-0.16	-2.28	1.10	1.21	5.14%	259
21	Hungary	0.06	0.30	0.57	0.29	3.81%	52
22	India	0.23	1.21	0.99	0.91	44.12%	99
23	Indonesia	-4.67	-1.11	-0.53	-0.02	22.53%	11
24	Ireland	0.02	0.49	0.26	0.98	11.24%	280
25	Isle of man	0.49	1.29	0.98	0.39	2.65%	99
26	Israel	0.14	1.50	-0.74	-0.78	6.06%	60
27	Italy	0.01	0.07	0.62	1.49	3.79%	101
28	Japan	0.17	2.88	0.34	0.48	11.78%	101
29	Korea	0.54	3.08	0.16	0.14	9.60%	88
30	Kuwait	-0.05	-1.03	0.40	1.05	2.16%	132

#	Domicile	β_{1i}	*t*-statistic	β_{2i}	*t*-statistic	R^2	N
31	Liechtenstein	0.00	0.01	-0.20	-0.42	8.52%	160
32	Luxembourg	0.00	-0.06	0.42	2.01	13.29%	280
33	Malaysia	-0.29	-0.92	-0.48	-0.30	3.17%	86
34	Malta	0.11	0.90	0.60	0.74	3.42%	100
35	Mauritius	0.04	1.57	0.06	0.15	17.48%	268
36	Mexico	0.47	2.36	3.10	1.94	12.25%	101
37	Monaco	0.05	0.86	-0.11	-0.30	27.37%	100
38	Netherlands	0.01	0.12	1.01	1.48	2.01%	198
39	New Zealand	0.29	3.73	-0.62	-0.80	10.41%	136
40	Nigeria	-0.12	-1.28	0.34	0.32	25.87%	40
41	Norway	-0.03	-0.25	0.35	0.36	0.66%	99
42	Pakistan	0.00	0.01	0.70	0.45	16.25%	14
43	Philippines	0.14	1.08	0.23	0.40	49.71%	100
44	Portugal	0.00	-0.19	-0.05	-0.15	41.63%	52
45	Qatar	0.09	0.77	1.11	0.73	8.01%	30
46	Romania	0.12	0.87	0.61	1.05	13.66%	41
47	Russia	-0.08	-1.44	0.14	0.25	32.14%	100
48	Saudi Arabia	-0.30	-1.24	-0.96	-1.01	4.25%	99
49	Singapore	-0.01	-0.22	0.15	0.46	3.54%	278
50	Slovenia	-0.10	-2.38	-0.10	-0.29	8.96%	73
51	South Africa	0.36	5.61	1.78	1.80	14.06%	101
52	Spain	0.31	2.66	0.76	1.07	9.29%	101
53	Sweden	0.06	0.76	0.23	0.25	1.49%	191
54	Switzerland	0.12	3.51	0.22	0.72	5.41%	280
55	Taiwan	0.30	0.87	-3.90	-1.46	10.43%	101
56	Thailand	0.42	1.74	0.15	0.21	9.08%	77
57	Turkey	0.03	0.21	0.63	0.36	0.29%	146
58	UAE	-0.04	-0.63	0.79	1.24	8.77%	100
59	UK	0.02	0.88	0.55	1.95	2.84%	280

Panel B: For domiciles with significant relationship with domicile return

Domicile	β_{1i}	*t*-statistic	β_{2i}	*t*-statistic	R^2	N
Bulgaria	-0.49	-2.43	0.17	0.25	8.45%	41
Slovenia	-0.10	-2.38	-0.10	-0.29	8.96%	73
Hong Kong	-0.16	-2.28	1.10	1.21	5.14%	259
Bahamas	-0.30	-2.26	1.21	0.61	3.43%	178
China	-0.20	-2.10	0.67	0.46	11.17%	74
France	0.10	2.15	0.27	0.58	8.40%	266
Greece	0.38	2.24	1.12	1.12	22.14%	101
Mexico	0.47	2.36	3.10	1.94	12.25%	101
Czech	0.13	2.56	-0.47	-1.26	32.75%	94
Spain	0.31	2.66	0.76	1.07	9.29%	101
Japan	0.17	2.88	0.34	0.48	11.78%	101
Brazil	0.53	3.00	3.03	1.83	10.62%	101
Korea	0.54	3.08	0.16	0.14	9.60%	88
Australia	0.25	3.19	0.71	0.96	6.42%	161
Switzerland	0.12	3.51	0.22	0.72	5.41%	280
New Zealand	0.29	3.73	-0.62	-0.80	10.41%	136
South Africa	0.36	5.61	1.78	1.80	14.06%	101

Panel C: For domiciles with significant relationship with US flow

Domicile	β_{1i}	*t*-statistic	β_{2i}	*t*-statistic	R^2	N
Luxembourg	0.00	-0.06	0.42	2.01	13.29%	280
Denmark	0.04	0.89	1.10	2.41	6.69%	253

ONLINE APPENDIX B

This appendix reports results for estimates for equations (B1), (B2), and (B3) when estimated for each domicile.. If we take non-US MF flows as *A*, non-US MF returns as *B*, US MF returns as *C*, and US MF flows as *D*, then we have the following equations to test:

$A \approx C$: Domicile MF flows ≈ US MF returns

$$Domicile\ flow_{i,t} = \gamma_i + \delta_i\ US\ return_{i,t-1} + \varepsilon_{i,t}\ , \qquad \text{(B1)}$$

$A \approx D$: Domicile MF flows ≈ US MF flows

$$Domicile\ flow_{i,t} = \zeta_i + \eta_i\ US\ flow_{i,t-1} + \varepsilon_{i,t}\ , \qquad \text{(B2)}$$

$B \approx D$: Domicile MF returns ≈ US MF flows

$$Domicile\ return_{i,t} = \lambda_i + \mu_i\ US\ flow_{i,t-1} + \varepsilon_{i,t}\ , \qquad \text{(B3)}$$

Table B1: Domicile dyads components

The table reports average *t*-statistic, beta coefficient, R^2 , adjusted R^2 and the proportion of coefficient estimates that are positive or negative (Panel A) for these following return regression models:

$$Domicile\ flow_{i,t-1} = \gamma_i + \delta_i\ US\ return_{i,t} + \varepsilon_{i,t} \quad (B1)$$

$$Domicile\ flow_{i,t-1} = \zeta_i + \eta_i\ US\ flow_{i,t} + \varepsilon_{i,t} \quad (B2)$$

$$Domicile\ return_{i,t-1} = \lambda_i + \mu_i\ US\ flow_{i,t} + \varepsilon_{i,t} \quad (B3)$$

With i = domicile 1 to 60. Column Equation (1), (2), (3) reports statistics from the estimate of equation (B1), (B2), (B3) respectively. Each model is run separately for each domicile *i*. The table reports equally weighted average coefficient estimates and *t*-statistics across domiciles, the proportion of coefficient estimates that are positive or negative, and significant or insignificant at the 95% level, across domiciles. N reports the average number of monthly observations across domiciles.

Panel A: Average *t*-statistic, beta coefficient

	(1) Average δ_i	(2) Average η_i	(3) Average μ_i
Average coefficient estimate	0.105	0.321	-0.141
Average T-stat	0.178	0.554	0.000
R^2	1.04%	0.91%	1.02%
Adjusted R^2	-0.07%	-0.21%	-0.10%
N	142.23	142.23	142.23

Panel B: Proportion of coefficient estimates that are positive or negative

	Proportion	Proportion	Proportion
Positive beta	56.67%	71.67%	43.33%
Negative beta	43.33%	28.33%	56.67%
Positive significant beta	1.67%	10.00%	5.00%
Negative significant beta	0.00%	0.00%	0.00%