Frontier and Emerging Markets: A Perspective from Portfolio Flows and Financial Integration

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ABSTRACT

This paper investigates to what extent low-income developing countries (LIDCs) characterized as frontier markets (FMs) have begun to be subject to capital flows dynamics typically associated with emerging markets (EMs). Using a sample of developing countries covering the period 2000–14, we show that: (i) average annual portfolio flows to FMs as a share of gross domestic product (GDP) outstripped those to EMs by about 0.6 percentage points of GDP; (ii) during years of heightened stress in global financial markets, portfolio flows to FMs dried up like those to EMs; and that (iii) FMs have become more integrated into international financial markets. Our findings confirm that, in terms of portfolio flows, FMs have become more similar to EMs than to the rest of LIDCs and are therefore more vulnerable to swings in global financial markets conditions. Accordingly, it is important to have in place frameworks to strengthen FMs' resilience to adverse capital flows shocks.

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1. INTRODUCTION

A key lesson from the emerging markets (EMs) crises of the 1990s and early 2000s is that sharp swings in capital flows can have dire macroeconomic consequences. In emerging markets and developing countries (EMDCs), capital inflows can supplement domestic savings and help boost both physical investment and economic growth. However, reaping the benefits of financial openness and large capital flows without incurring considerable risks is a challenge for policymakers in many countries. In EMs, surges in inflows are often associated with procyclical macroeconomic policies and precede financial crises (Kaminsky et al., 2004). In economies with

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intermediate levels of financial development, financial openness may, as Aghion et al. (2004) note, induce chronic phases of strong economic growth with capital inflows followed by collapses with capital flow reversals. The likelihood of reversals and the severity of the ensuing economic downturn depends in part on the composition of capital flows. Foreign direct investment (FDI) is found to be more stable and less prone to reversals than private loans and portfolio flows (Sula and Willett, 2009; Chuhan et al., 1998).

Against this backdrop, the surge of portfolio flows to some frontier markets among low-income developing countries (LIDCs) since the mid-2000s has fueled debates about those countries' growing vulnerability to similar adverse capital account shocks.[1] Traditionally, LIDCs had to rely on official resources to cover their balance of payments (BoP) needs (IMF, 2014a), and most of them continue to do so. However, since the mid-2000s and especially in the aftermath of the 2008 global financial crisis (GFC), relatively strong macroeconomic performance in a subset of frontier markets (FMs), together with low interest rates in advanced economies (AEs), heightened foreign investors' interest in portfolio assets from those markets. Based on the experience of EMs' crises, larger inflows into FMs have raised several questions from researchers and policymakers regarding not only short-term but also medium-term macroeconomic management challenges and external vulnerability.[2]

In this paper, we investigate whether, in light of low-income FMs' experience with capital flows in recent years, they actually resemble EMs and are thereby vulnerable to capital flow reversals or they remain as the rest of LIDCs. Our analysis focuses on similarities in portfolio flow dynamics facing FMs, the rest of the LIDCs, and EMs. Insights from a number of recent studies offer a storyline that buttresses the motivation of this paper. By 2015, surges in gross non-FDI private flows (as percent of GDP) to LIDCs were comparable to those of EMs (Araujo et al., 2015). Most of these flows have gone to FMs. This is in line with the fact that investing in FMs, more broadly defined, has been considered as a good diversification strategy because returns on FMs' assets have generally been less correlated with global market returns owing to their limited integration with global economic and financial markets (Berger et al., 2011; Oey, 2014). While the limited integration of low-income FMs in global financial markets explains their resilience to the GFC, large cross-border portfolio flows to FMs in the aftermath of the crisis are seen as exposing FMs more than in the past to global markets volatility. However, this important issue has not been empirically tested much using econometric methods.

Our empirical investigation of whether FMs resemble EMs in terms of their exposure to private capital flows and their volatility relies on a two-pronged econometric analysis and makes important contributions to the literature. First, using a difference-in-differences (DiD) estimation on annual data covering a panel of 76 countries during 2000–14, the paper assesses the order of magnitude of net portfolio investment to FMs relative to other developing countries subgroups – EMs and the rest of LIDCs, referred to as the non-FM LIDCs – controlling for standard determinants of capital flows. The use of a DiD estimation is, to the best of our knowledge, a novelty to the capital flows literature. Second, using an international capital asset pricing model (ICAPM) model including monthly sovereign bond returns for FMs over 2000–14, the paper investigates whether there have been significant changes in the linkage between FMs and international capital markets since the GFC and discusses what the changes, if any, entail for risks facing FMs relative to EMs.

Three main results emerge from our analysis and support the view that FMs resemble EMs in terms of vulnerability to capital flow reversals. First, based on the DiD approach, we find that, after the GFC, average annual net portfolio investment to FMs outstripped those to

[1] There is not a single definition of FMs. For the purpose of our analysis, we rely on the taxonomy of LIDCs the IMF proposes in a 2014 policy paper in which FMs are LIDCs that meet well-defined criteria related mainly to the depth and openness of their financial markets and access to international sovereign bond markets. From the perspective of investment banks and rating agencies, FMs represent a relatively diverse group of countries, including also medium and high-income countries that fall outside the markets generally included in global equity or bond indices and are characterized by their less-developed capital markets, structural weaknesses, and their tendency to have higher idiosyncratic risks.

[2] Berger et al. (2011); Chan-Lau J., 2014; Marshall et al. (2015), IMF, 2014.

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EMs by about 0.6 percentage point of GDP while, unsurprisingly, portfolio flows to non-FMs LIDCs (NFM-LIDCs, henceforth) did not exhibit substantial changes. This suggests that, although portfolio flows to FMs remain small in dollar terms compared with those of EMs, their importance relative to the size of recipient countries' economies has increased drastically in the post-GFC period. Second, while having increased in the post-GFC period as a whole, net portfolio flows to FMs dried out in years of heightened global risk aversion, notably during 2008–09 and in 2013, the year of the taper tantrum. Third, from the asset pricing analysis, we find that there has been a noteworthy change in FMs' market betas with respect to global market returns, indicating an increase in financial integration and comovement of returns after 2008. These findings confirm that FMs have become more similar to EMs than the rest of the LIDCs and are therefore more likely to be subject in similar ways to the effects of adverse changes in global financial markets conditions. Our findings withstand various robustness checks.

The paper complements three strands of the empirical literature on the drivers of capital flows and the vulnerability of recipient countries' economies to flow reversals. First, the paper belongs to the literature on the determinants of capital flows to developing countries, the so-called pull and push factors, which also encompasses the literature on the spillovers of monetary easing in the United States (US) and other AEs (Byrne and Fiess, 2011; Blanchard et al., 2011; Ghosh et al., 2014; Joyce et al., 2011; Krishnamurthy and Vissing-Jorgensen, 2011; Fratzscher et al., 2013); Forbes and Warnock, 2012; Suchanek and Rai, 2014; and Claeys and Darvas, 2015). Second, it contributes to the growing literature on capital flows to FMs. Third, it contributes to the literature on the integration of developing countries into international financial markets and their vulnerability to changes in global financing conditions, with a particular focus on FMs (Cheng et al. (2010), Berger et al. (2011), Chan-Lau (2014), Marshall et al. (2015)).

The remainder of the paper is organized as follows. Section 2 presents a review of the literature. Section 3 discusses the data and empirical methodology. Section 4 presents the results. Section 5 concludes.

2. LITERATURE REVIEW

The literature on capital flows dynamics has a long tradition of distinguishing the role of external or global factors from that of country-specific ones. External or global factors reflect a push on investment funds generally toward developing countries. Country-specific or pull factors are those reflecting domestic investment opportunities and associated risks. They include indicators of domestic economic performance, asset returns, and country risk. Push factors are meant to capture the returns on alternative investment opportunities in mature economies, as well as global risk aversion. From a theoretical viewpoint, capital flows must reflect the confluence of both push and pull factors.

The push and pull factors fit into two key broad theories of the economics and finance literature that have relevance for our analysis. The first is the neoclassical economic theory, which posits that capital flows are driven by returns differentials. According to this theory, in the absence of capital account restrictions, capital would flow from capital-abundant economies to capital-scarce economies where returns higher. Against this background, it is expected that capital moves from advanced economies to developing ones. The second key theory is the Capital Asset Pricing Model (CAPM) from the finance literature. The CAPM introduces the notion of risk as an element that, beside returns, should influence investors' allocation of capital among alternative assets in their portfolios. The CAPM builds on the model of portfolio choice developed by Harry Markowitz (1959), which assumes perfect capital markets. It also assumes that, in making their portfolio choices, risk averse investors care only about the mean and variance of their investments' returns. This model was augmented later with the introduction by William Sharpe and John Lintner of the

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assumption that investors can borrow and lend at the risk-free rate, resulting in the Sharpe-Lintner CAPM model. This model suggests that the expected value of an asset's return is equal to the risk-free rate plus the asset's expected risk premium, which is the asset's beta times the expected market return in excess of the risk-free rate. [3] The extension of the CAPM to portfolio choices in an international setting results in the international CAPM (ICAPM).

In empirical studies, the predictions of the two main theories underpinning capital flow dynamics have, at best, been mixed. On the one hand, several studies confirm the role of returns differentials between advanced and developing countries as drivers of capital flows to developing countries. Such studies include also those that examine the spillovers of monetary easing in the United States and other AEs (Byrne and Fiess, 2011; Blanchard et al., 2011, Ghosh et al., 2014; Joyce et al., 2011; Krishnamurthy and Vissing-Jorgensen, 2011; Fratzscher et al. 2013; Forbes and Warnock, 2012; Suchanek and Rai, 2014, Claeys and Darvas, 2015). Likewise, some studies find evidence supporting the predictions of the ICAPM. On the other hand, several empirical studies highlight puzzles that do not conform to the predictions of the above-mentioned two theories. For instance, some studies find that capital does not flow from rich to poor countries, the so-called Lucas paradox (Lucas, 1990; Alfaro, 2008). Others find that portfolios are not diversified enough to take advantage of higher returns/yields on foreign assets, the so-called home bias (Levy and Levy, 2004; Mishra, 2015).

The puzzles or paradoxes are attributed to realities that depart from the two models' simplifying assumptions, fueling related research built on alternative theories or assumptions. For instance, the assumption of perfect or complete integration of international financial markets, which is central to the predicted efficient portfolio outcome in the ICAPM turns out not to be plausible. Based on this assumption, by analogy to what the CAPM posits for a single domestic market, in the global market, investors are exposed to global market risk and diversifiable country-specific risks, resulting in expected returns that solely depend on global risks factors in an asset pricing relationship common to all countries. In reality, there are frictions and informational asymmetries that make integration imperfect and time-varying, thereby helping explain investors' overreaction to changes in global factors, which lead to observed phenomena such as, shifting risk appetite, herding, contagion, as well as surges and reversals that characterize capital flows to EMs. Against this backdrop, the empirical literature on capital flows that brings to light these realities that depart from highly stylized models' assumptions is particularly relevant for our study. We next review selected relevant papers.

In the empirical literature on the push and pull factors of capital flows, we focus on the strand investigating the dynamics of capital flows to EMs, as well as the strand on capital flows to FMs. There are numerous studies that try to identify push and pull factors explaining the size and volatility of capital flows (Calvo, Leiderman and Reinhart, 1993; Chuhan, Claessens, and Mamingi, 1993; Fernandez-Arias, 1996; Taylor and Sarno, 1997; Fratzscher, 2011; Ghosh, Ostry and Qureshi, 2018). Of particular interest are studies highlighting the reaction of capital flows to changes in global factors around times of crises or heightened global risk aversion. We briefly review three studies: Fratzscher (2012), Byrne and Fiess (2016), and Avdjievet al. (2016). Fratzscher (2012) employs a factor model to investigate the main drivers of portfolio flows for a sample of 50 AEs and EMs during 2005–2010. He finds that push factors in the form of shocks to global liquidity and risk have exerted large, heterogeneous, and time-varying effects on capital flows. In particular, consistent with the flight-to-quality hypothesis, a rise in risk during the crisis triggered a reallocation of capital from many EMs to some AEs, while it had the opposite effect prior to the crisis and during the recovery. Heterogeneity of the impacts across countries arises from differences in the strength of domestic institutions and macroeconomic fundamentals.

[3] The market beta of a given asset is the covariance of the asset's return with the market return divided by the variance of the market return. For a comprehensive review of CAPM literature, see: Fama and French, 2004; Perold, 2004.

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There is broad support for the findings of Fratzscher (2012) in Byrne and Fiess (2016) as well as Avdjievet al. (2016). Using a sample of nearly 65 EMs during 1993–2009, Byrne and Fiess (2016) investigate the determinants of capital inflows and the importance of common factors in driving the global supply of capital using fixed effects and principal components estimation, respectively. They find evidence of a negative correlation between aggregate flows to EMs and real long-run interest rates in the US. They also find that an increase in global risk aversion reduces flows to EMs. Avdjievet al. (2016) use fixed-effects estimation to examine the importance of global factors for cross-border loans and international debt securities flows using panel of 64 AEs and EMs covering the period 2000–2013. They find a negative relationship between these flows and both US monetary policy rate and global risk aversion. They also find that the sensitivity of both types of capital flows to global factors changed considerably in the aftermath of the GFC, with some heterogeneity. In particular, the impact of US monetary policy on both flows increased while that of global risk aversion decreased for bank flows and increased for bond flows, with the latter driven by bond flows to EMs.

In the second strand on capital flows to FMs, studies focused on the increased flows and associated vulnerabilities are particularly of interest. Guscina et al. (2014) documents how the search for yield in the context of low interest rates made international bonds an attractive financing alternative for many developing countries, including some first-time issuers, resulting in a sharp increase in portfolio inflows to these countries. To highlight the vulnerabilities associated with the increased portfolio flows for FMs, they focus on the pricing of bonds in secondary markets and estimate the determinants of bond spreads on a panel of 44 EMs and FMs during 2000–2013. They find that, controlling for institutions and macroeconomic fundamentals, FMs' bonds trade at a premium relative to EMs' bonds. Moreover, they find evidence that spreads increase in times of heightened global risk aversion reflected in an increase of the VIX or drop in global liquidity, captured by a higher Federal funds rate. These findings are in line with those of other studies suggesting that FMs tend to face wider bond spreads when global financial conditions tighten (IMF, 2014b; IMF, 2016).

The third strand of the empirical literature related to ours is that assessing the level of financial markets integration. In this literature, there are variations in how integration is measured. Integration is measured by looking at returns on a country or group of countries' assets relative to regional or global asset returns. A widely used measure of integration is the correlation of financial assets' returns. Critics suggest that correlations do not properly reflect integration when there are several sources of volatility affecting global market indices to which country-specific indices respond differently (Pukthuanthong and Roll (2009), Bekaert and Harvey (1995), Bekaert et Mehl (2014)).

We discuss two alternative measures of financial integration proposed in the literature. Market integration is measured by the proportion of a country's returns that can be explained by global factors (Pukthuanthong and Roll (2009)). Following Forbes and Rigobon (2002), critics of this measure of integration argue that it is flawed because, in times of higher volatility of global relative to country-specific volatility, it will unduly indicate a greater degree of integration. Bekaert and Harvey (1995) propose a methodology that allows for the degree of market integration to change through time. Bekaert and Harvey (1995) propose a measure of integration that allows for differing prices of variance risk across countries which depending on country-specific information and a world price of covariance risk which depends on global information. Related to Bekaert and Harvey (1995), Bekaert et Mehl (2014) proposes a measure of integration that employs conditional betas of a country's stock return with respect to global and regional equity market returns. We adopt the beta-related measure of integration according to which the higher the beta, the greater the integration.

Our review of studies investigating market integration covers selected papers using variants of the ICAPM. Pukthuanthong and Roll (2009) investigate trends in global integration based

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on a sample of 34 countries during 1973–2006. They find that for most countries, integration increased over the three-decade period while for some, including certain FMs, it is the opposite. Bekaert et Mehl (2014) investigate stock markets integration based on stock indices of 15 countries and global as well as regional indices covering the period 1885 to 2014. They find that global financial market integration was high in the period before 1913, still higher post-1990, and low in the interwar period. Berger, Pukthuanthong, and Yang (2010) employ principal components to examine the extent to which FMs are integrated within international financial markets using returns on global and Emerging Markets indices and returns on country-specific indices for 25 FMs during 1989–2009. They find that not only do FMs exhibit low levels of integration with world markets, but also these levels of integration do not appear to increase through time. There are two takeaways on financial markets integration from the papers reviewed. First, conclusions about the degree of integration depend on the definition used. Second, integration is time-varying, suggesting that the process of international financial integration is not a gentle climb towards ever higher peaks (Bekaert and Mehl, 2014).

Our paper brings together the literature on the determinants of capital flows to developing countries and that of their integration into the global financial market with a focus on FMs. On the capital flows front, we contribute to the literature by looking at flows dynamics before and after an exogenous shock, using a methodology new to this literature, the difference-in-difference (DiD) estimation. This methodology has been used in several areas of the economics and finance literature. For instance, Acemoglu et al. (2004) use DiD to investigate the effects of female labor force participation before and after World War II on earnings by level of education. Ouyang and Peng (2015) uses DiD to study the macroeconomic effect of the 2008 Chinese Economic Stimulus Program. To the best of our knowledge, DiD has not been used to analyze differences in capital flows dynamics between groups. To gauge FMs' integration in global markets, we rely on the ICAPM.

We build on the insights from the literature to formulate three hypotheses that are subsequently tested in econometric analyses. The first hypothesis (H1) is the basis of our tests for the shift in the size of capital flows. Conditional upon H1 being true, the second hypothesis (H2) allows us to test the sensitivity of capital flows to changes in global risk aversion, thereby helping to assess differences in volatility of capital flows between FMs and the control group. The third hypothesis (H3) aims to test for changes in FMs' financial integration with the global markets, i.e., financial spillover risk. H3 is conditional upon H1 being true. Each hypothesis is explained below.

Hypothesis 1 (H1): Catching-up on capital flows

$$\{low\ \mathbf{r}\ environment\} + \{\sigma_{LQ-EM} \approx \sigma_{FM}\} + \{E[R_{FM}] \geq E[R_{LQ-EM}]\} \rightarrow$$

$$\rightarrow \{\text{“}Serch\ for\ Yield\text{”}\} \rightarrow \Delta\left[\frac{CF}{Y}\right]_{FM} \geq \Delta\left[\frac{CF}{Y}\right]_{LQ-EM}$$

where r is the world interest rate, σ stands for the country risk profile, $E[.]$ denotes mathematical expectation, R represents the rate of return on private investment, Y is the output and CF stands for capital flows.

Hypothesis 1 suggests that in a low interest rate environment, where the underlying macroeconomic risks in EMs and FMs are broadly similar and where the expected rate of return on FM assets is equal to or higher than that on EMs' assets (as in Figure 4), increases in private capital flows to FMs will be comparable to those to EMs reflecting the investors' search for higher yields. In our analysis, we take the 2008 monetary easing in AEs as an exogenous shock that

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results in ample liquidity, search for yield, reduction in investors' risk aversion, and increased capital flows to EMDCs. Drawing on the stylized facts, we consider that these increases, measured in percent of recipient countries' GDP, differ across the following three subgroups of EMDCs: (i) NFM-LIDCs with low integration and financial development; (ii) FMs with stronger macroeconomic fundamentals; (iii) EMs with the strongest fundamentals. We expect FMs to attract more or at least equal amount of capital flows compared to EMs unlike NFM-LIDCs.

Hypothesis 2 (H2): Increased sensitivity of FMs to global economic and financial developments

If Hypothesis 1 is true, i.e., if we find evidence of a significant increase in private portfolio flows to FMs that make them resemble more those to EMs, we expect FMs to become more exposed to external financial shocks and changes in investor sentiment. Therefore, in turmoil times the flows would significantly decrease. This is also a reflection of greater integration into global financial markets. Hence, our third hypothesis.

Hypothesis 3 (H3): Greater integration of FMs into global financial markets

If H1 is verified, it means that FMs increasingly resemble EMs and their financial integration increases. Therefore, we expect increased comovement between FMs' bond returns and global bond returns. In particular, we expect, in an ICAPM regression, FMs' market beta to increase and become significant after 2008.

3. DATA AND METHODOLOGY

3.1. Data

To investigate our questions of interest, we first define country groups and then collect two types of data: variables on non-official capital flows and determinants, and financial market variables. First, to construct the country groups, we use the IMF's World Economic Outlook (WEO) country classification, consisting of advanced economies (AEs) and emerging markets and developing countries (EMDCs). The EMDCs group is very heterogeneous. Within the EMDCs, the subgroup of countries whose gross national income (GNI) fall below the World Bank's upper middle-income countries' (UMIC) threshold is relevant for our study as it includes lower quartile emerging markets (LQ-EMs) and low income developing countries (LIDCs). The subgroup of LQ-EMs is made up of 16 countries (listed in Appendix Table II, Panel A) with per capita GNI higher than the IDA cutoff.[4] The remaining countries comprise the LIDCs group, and consist of 60 countries listed in Appendix Table I.[5] In 2014, the IMF classified 14 LIDCs as FMs based on a number of criteria.[6] The list of FMs with the year in which they first met the FMs' qualification criteria is in the left column of Panel A, Appendix Table II. Countries in the LQ-EMs subgroup are closest to FMs in terms of depth and openness of financial markets and

[4] These correspond to the World Bank's cut-off points for lower middle-income (LMIC) and upper middle-income (UMIC) countries for FY2013, respectively.

[5] These countries have economic features that differ markedly from those of higher income countries and are eligible for concessional financing from both the IMF and the World Bank based on relative poverty assessed through income thresholds set by the International Development Association (IDA). The IDA income threshold that guide the determination of eligibility for IMF's concessional lending under the Poverty Reduction and Growth Trust (PRGT) facilities is updated annually. As of end-2014, LIDCs had the following characteristics: (i) PRGT-eligible as per the 2013 PRGT Eligibility Report; (ii) Gross National Income (GNI) per capita less than the ad-hoc PRGT income graduation level for non-small states (twice the IDA cut-off point or US$2,390 for FY2013).

[6] The selection criteria focus on the depth and openness of the financial system and the issuance of sovereign bonds. Each LIDC is benchmarked against EMs as follows: (i) LIDCs that are within one standard deviation below the EM average for the following variables: M2 to GDP; cross border loans/deposits, stock market capitalization, and portfolio inflows; and (ii) LIDCs that have accessed (or have the potential to access: proxied by sovereign ratings similar to those that have issued sovereign bonds) sovereign bond markets, putting them on the radar screen of international fund managers. Details are in Appendix II of IMF, 2014b.

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access to international sovereign bond markets and also in terms of economic and development indicators such as poverty rates, life expectancy at birth, the share of agricultural employment in total employment, and domestic credit to the private sector relative to GDP. Moreover, the quality of their institutions as rated by the World Bank's Country Policy and Institutional Assessment (CPIA) and their risk of debt distress ratings ("Short-term Vulnerabilities") are similar to the LIDCs' average.[7] Therefore, countries in the LQ-EM subgroup are used as a control group.

Secondly, to analyze the private capital flows to LIDCs and FMs, we collect data for two sets of variables. The first set comprises net portfolio inflows and pull factors. Portfolio flows and pull factor series related to countries' macroeconomic performance are obtained from WEO. Data for an additional pull factor we use as a proxy for governance in some robustness check regressions, country-specific financial risk rating, is obtained from the International Country Risk Guide (ICRG). We construct a panel of 76 countries with annual data covering the period 2000–14. The sample includes all LIDCs and countries in the LQ-EMs.[8] The net portfolio investment variable is scaled by GDP. The issue of using net flows versus gross flows has been frequently debated in the literature. Given the questions we are interested in, we report results on net flows, following Ahmed and Zlate (2014). The second set of variables includes global push factors such as the U.S. 10-Year Treasury Bond Yield and VIX index, obtained from FRED (Federal Reserve Economic Data) and Bloomberg. This variable is available for only half of the countries in our sample.

Thirdly, to test for changes in FMs' financial integration with the global markets, we use bond-index data. These include individual FM country indices and a global bond index. To construct bond returns in FMs in our sample, we use JP Morgan's NEXGEM index. NEXGEM index is a fixed-income benchmark that provides exposure to non-investment grade rated, smaller, less liquid population of EMs economies or FMs. It includes 18 countries representing Sub-Saharan Africa, Central American, the Caribbean, Middle East, Europe, and Asia. We use the bond index for each country to construct bond returns and apply our financial integration methodology. In total, we have 12 FMs and 10 EMs with data available (Appendix II Panel B). To capture the global bond returns, we use JP Morgan Global Aggregate Bond Index (GABI), which consists of the JPM GABI US, a U.S. dollar denominated, investment-grade index spanning asset classes from developed to emerging markets, and the JPM GABI extends the U.S. index to also include multi-currency, investment-grade instruments.

3.2. Stylized Facts

Summary statistics in Table 1 provide insights on the volume and volatility of portfolio flows to developing countries across subgroups and time periods. We report statistics on the evolution of net portfolio flows to the two LIDCs' subgroups and the EM control group before and after 2008. The figures suggest that, on average, net portfolio flows to all groups increased after 2008. The means suggest also that net portfolio to FMs outstripped those to the EM control group. Standard deviations suggest that after 2008, the volatility of net portfolio flows to all but the NFM-LIDC group increased and that the increase was more pronounced for FMs.

[7] The World Bank maintains and updates the CPIA to assess the quality of a country's policies and institutional arrangements along 16 criteria grouped into four equally-weighted clusters: economic management, structural policies, policies for social inclusion and equity, and public sector management and institutions. Countries are rated on a scale of 1 (low) to 6 (high) for all of the sixteen criteria and are assigned an overall score.

[8] The sample size for regressions including the financial risk rating variable is reduced as this variable is available for only half of the countries in our sample.

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Table 1.
Summary Statistics

	Net Portfolio Investment (% GDP)			
	Mean	Std.Dev	Min.	Max.
LIDCs				
2000–08	0.693	1.129	0.124	0.329
2008–14	0.354	0.207	0.105	0.670
FMs				
2000–08	0.135	0.446	-0.444	1.277
2008–14	1.007	0.807	-0.108	2.397
NFM-LIDCs				
2000–08	0.046	0.719	-0.054	0.218
2008–14	0.130	0.124	-0.063	0.335
EMs (Control group)				
2000–08	0.077	0.331	-0.507	0.686
2008–14	0.386	0.317	0.005	0.843

The correlation matrix in Table 2 provides preliminary insights into the bivariate relationships between the variables we use in our empirical estimation of net portfolio flows. In particular, there is a negative relationship between portfolio inflows EMDCs receive and the VIX as well as interest rates in major AEs, proxied by the 10-year US Treasury bond yield. Also, the correlations among the variables we use are all very low, suggesting that there should be no concerns about multicollinearity among regressors.

Table 2.
Explanatory Variables-Correlation Matrix

	Portfolio Investment/ GDP	VIX	U.S 10-Y Treasury Bond Yield	Growth	Debt/ GDP	Fiscal Balance/ GDP	Current-Account/ GDP	Exports/ GDP
Portfolio Investment/GDP	1							
VIX	-0.0672* (*0.0302*)	1						
U.S 10-Y Treasury Bond Yield	-0.1303* (*0.0000*)	0.1124* (*0.0002*)	1					
Growth	0.0429 (*0.1674*)	-0.1084* (*0.0004*)	-0.008 (*0.7760*)	1				
Debt/GDP	-0.0562 (*0.0784*)	0.0261 (*0.4083*)	0.267* (*0.0000*)	0.1061* (*0.0008*)	1			
Fiscal Balance/GDP	-0.0392 (*0.2102*)	-0.0875* (*0.0047*)	0.089* (*0.0030*)	-0.0897 (*0.0013*)	-0.102* (*0.0010*)	1		
Current-Account/GDP	-0.1189* (*0.0001*)	-0.0324 (*0.2919*)	0.189* (*0.0000*)	0.0257 (*0.4032*)	-0.086* (*0.0050*)	0.112* (*0.0030*)	1	
Exports/GDP	0.0463 (*0.1357*)	-0.0406 (*0.1857*)	0.0305 (*0.3200*)	0.1114* (*0.0003*)	-0.066* (*0.0350*)	0.1053* (*0.0006*)	0.1668* (*0.0000*)	1

p-values are reported in parantheses and * denotes significance.

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3.3. EMPIRICAL METHODOLOGY

In this paper, we use a two-pronged empirical strategy based on: (i) Difference-in-differences (DiD); (ii) International Capital Asset Pricing Model (ICAPM). DiD helps analyze the changes in net portfolio flows to FMs. ICAPM enables us to test and document impact of these changes on the financial integration of FMs.

In the first part of our empirical analyses, we use the ***difference-in-differences* (*DiD*)** approach to identify, the average effect of being perceived as a frontier market (FM) on net portfolio flows. Borrowing from Rubin's (1974) description of causal effects in non-randomized experiments, we are interested in estimating, from a population of developing countries, the typical causal effect of a country being treated as FM versus non-FM on net portfolio flows to the country (i.e., the average impact of treatment on the treated). The GFC and the ensuing search for yields associated with low interest rates offer a useful window for assessing variations in portfolio flows within and across developing countries subgroups. We exploit the pre- and post-crisis pattern of capital flows to compare portfolio flows to countries when they are perceived as FMs to portfolio flows to a control group (LQ-EMs), an estimate of the counterfactual.

In DiD estimation in general, outcomes are observed for two groups during two time-periods and the estimation is used to assess the impact of a particular treatment on the outcome of the treated group. One of the groups is exposed to a treatment in the second period but not in the first period. In panel data, with the same units within a group being observed in each period, the average gain in the non-treated group (the control group) is subtracted from the average gain in the treatment group to get an estimate of the effect of the treatment. Assuming that Y_1 and Y_0 are outcomes (net portfolio flows) after and before the crisis, the DiD logic can be better illustrated in a box using, in line with our analysis, FMs and LQ-EMs as treatment group and control group, respectively, to derive the effect of the treatment after the crisis.

Table 3.
Illustration of DiD estimation

	FMs (treatment group), $FM = 1$	LQ-EMs (control group), $FM = 0$
After the crisis, $t = 1$	$Y_1 / FM = 1$	$Y_1 / FM = 0$
Before the crisis, $t = 0$	$Y_0 / FM = 1$	$Y_0 / FM = 0$
In-group difference between post and pre-crisis outcomes	$(\bar{Y}_1 / FM = 1) - (\bar{Y}_0 / FM = 1)$	$(\bar{Y}_1 / FM = 0) - (\bar{Y}_0 / FM = 0)$
$DiD = [(\bar{Y}_1 / FM = 1) - (\bar{Y}_0 / FM = 1)] - [(\bar{Y}_1 / FM = 0) - (\bar{Y}_0 / FM = 0)]$		

An important methodological concern of the DiD estimation that is addressed in our analysis is that the estimate of the difference in outcomes between the treated group and the control group could be affected by other shocks taking place at the same time or by time-invariant country characteristics that have a bearing on portfolio flows, thereby precluding a meaningful causal inference between the treatment and the outcome. This concern is addressed in two ways. First, as indicated earlier, the control group is made of countries that are broadly similar to FMs in terms of developmental characteristics and are exposed to similar shocks. Second, using panel data and fixed-effects (FEs), we control for observed and unobserved time-invariant country-specific characteristics that might be correlated with both a country's characterization as FM, as well as the volume of portfolio flows it attracts.

The use of DiD approach is a novelty of this paper and an important contribution to the literature on capital flows in terms of assessing shifts in capital flows dynamics. To the best of our knowledge, this is the first paper that uses this type of empirical approach in a macroeconomic

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setting to understand the differences in capital flows dynamics between country groups. The DiD approach makes it possible to compare the convergence in portfolio flows both cross-sectionally and across time. The cross-sectional comparison avoids the problem of omitted trends by comparing two groups over the same period. The time series comparison avoids the problem of unobserved differences between two different country groups by looking at the same group of countries before and after the change (Roberts and Whited, 2013).

We model net portfolio inflows to FMs, NFM-LIDCs, and LQ-EMs (control group) using annual panel data from about 76 countries during 2000–14 and compare changes in portfolio flows taking into account country and time fixed effects. The country fixed effects control for unobserved, time invariant heterogeneity in countries' risks. The year fixed effects control for shocks common to all countries. The start date 2000 allows us to compare the period prior to the GFC (2000–08) when flows to LIDCs were lower, to the post-2008 period with notable increase in inflows following the monetary easing (shock). Our baseline regression is:[9]

$$\frac{NPI_{i,t}}{Y_{i,t}} = \beta_0 LIDC_{i,t} + \beta_1 Crisis_t + \beta_2 FM_{i,t} + \beta_3 FM_{i,t} Crisis_t + \\ + \beta_4 NFM_{i,t} Crisis_t + \gamma * X_{i,t} + \upsilon_i + \xi_t + u_{i,t} \quad (1)$$

where:

$NPI_{i,t}$ – Net Portfolio investment in US$
$Y_{i,t}$ – GDP in US$
$LIDC_{i,t}$ – 1 if country i is LIDC, 0 otherwise
$Crisis_t$ – 1 if the observation is after 2008, 0 otherwise
$FM_{i,t}$ – 1 if country i is FM, 0 otherwise
$NFM_{i,t}$ – 1 if country i is NFM-LIDC, 0 otherwise
$X_{i,t}$ – control factors
υ_i – country fixed effects
ξ_t – year fixed effects

Key variables of interest are: the interaction term between $FM_{i,t}$ and the crisis dummy (β_3) and the interaction term between $NFM_{i,t}$ and the crisis dummy(β_4) in Equation 1. If FMs and NFM-LIDCs are differently affected after 2008, we expect β_3 and β_4 to be statistically significant. If only FMs are affected, we expect β_3 to be positive and statistically significant.

A common approach in this type of regressions is to control for country-level characteristics as well as global determinants.[10] Therefore, we include several control variables, i.e., push and pull factors which the existing literature have found to explain changes in capital flows across time and countries. This allows us to get a "clean" measure of difference between portfolio flows to FMs and the EMs' control group (LQ-EMs) that can be attributed primarily to the monetary easing after the shock represented by the 2008 GFC.

As a second step, we use DiD to test for the increasing sensitivity of FMs to global risk aversion with two additional specifications (Eq. 2). With these, we examine whether, taking into account the level of global risk aversion, FMs are treated the same as EMs. In the first specification, we introduce a triple interaction term comprising FM, crisis, and VIX. If, after the crisis, FMs are treated as EMs, this interaction term should not be statistically significant.

[9] Details on the DiD empirical strategy can be found in the technical appendix.

[10] The approach can be found in several studies on the determinants of capital flows, e.g. Byrne and Fies, 2016; IMF, 2011; Ghosh et al., 2014; Fratzscher et al., 2013; Forbes and Warnock, 2012; Shaghil and Andrei, 2014; IMF, 2014.

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In the second step, considering that EMs experience a reduction of capital flows in periods of heightened stress in global financial markets, we run regressions to ascertain, from the yearly pattern of net portfolio flows, whether the experience of FMs is the same as that of EMs. Accordingly, in lieu of including one interaction term of the FM and crisis dummies, the regression includes several interactions terms of the dummy FM with a dummy for each of the years the sample covers. Focusing particularly on the post-crisis period, during which FMs are found to have experienced an increase in portfolio flows exceeding that of EMs, we expect the interaction terms of the FM dummy and year dummies to be positive and significant, except in years of heightened stress in global financial markets. We estimate the following regression model:

$$\frac{NPI_{i,t}}{Y_{i,t}} = \beta_0 LIDC_{i,t} + \sum_{t=2001}^{2014} \beta_t * D_t + \beta_2 FM_{i,t} + \sum_{t=2001}^{2014} \alpha_t * D_t * FM_{i,t} + \\ + \sum_{t=2001}^{2014} \gamma_t * D_t * NFM_{i,t} + \upsilon_i + \xi_t + \epsilon_{i,t} \tag{2}$$

where *LIDC*, *FM*, and *NFM* are defined as in equation (1); D_t is a dummy variable set equal to 1 if the observation falls during year *t*.

Our second empirical methodology, ***International CAPM* (*ICAPM*)**, serves to test for changes in the financial integration of FMs with global financial markets. We argue that as a result of FMs' larger capital flows after 2008, their financial integration with the global markets also increased. In other words, in a fully integrated world, local assets in an FM country are affected by the same type of world shocks that advanced markets experience. By contrast, when markets are segmented, a local economy may be largely shielded from such external shocks. However, as both the economic and financial integration increase, local assets would be affected more by shocks in advanced markets. As a result, correlations would increase (Bekaert and Harvey, 2000).

We calculate global market betas to test for the changes in FMs' integration with the global markets. To test for these, we use an ICAPM model. CAPM beta has been widely used for gauging the level of market integration. Some studies that have used it besides the selected discussed in the literature review are Bodnar et al. (2003) and Bruner et al. (2008). We also compare FMs' market beta with that of EMs'. The crisis year 2008, which corresponds to US monetary easing, is used as a break point in the sample period 2000–14. The sample covers 12 FMs and 10 EMs, and all the data is at monthly frequency. Our empirical model provides estimates of FMs' sensitivities to and comovement with global financial markets:

$$R_{i,t} - R_t^f = \alpha + \beta * \left(R_t^{Mkt} - R_t^f\right) + \gamma_i + \varepsilon_{i,t} \tag{3}$$

where $R_{i,t}$ represents the bond index return of country *i* at month *t*, R^{Mkt} is the market return on Barclays Global Bond Index, R_f is the risk-free rate proxied by 3-month US T-bill rate, γ_i stands for country fixed effects, and is the unexplained portion of the variance in the return for country *i* during month *t*. All returns are calculated using US$ prices.

Initially, we run single-factor CAPM tests with the global market index as specified above. Through these regressions, we aim to see if and how the global market beta changed after the monetary easing, which would indicate increase in financial integration if true. Then, we also run a two-factor CAPM, with both local and global indices (Equation 4 below). These reflect local

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and global factors, respectively. This results in a partial-integration model, where we assume that investors price both the global and local risk factors, but separately. In the literature, the notion of 'partial market integration' has been widely used for asset pricing in emerging markets. In our case, it is appropriate given the similarities between the current FMs' and the earlier EMs' experiences.

$$R_{i,t} - R_t^f = \alpha + \beta_1 * \left(R_t^{Mkt} - R_t^f\right) + \beta_2 * \left(R_t^{local} - R_t^f\right) + \gamma_i + \varepsilon_{i,t} \quad (4)$$

where the only difference from Equation 3 is the term $\beta_2 * \left(R_t^{local} - R_t^f\right)$. R_t^{local} stands for the return on a narrow or immediate benchmark index that includes FM or EM bonds. For FMs and EMs, "local" indices are proxied by JP NEXGEM index and EMBI, respectively.

If FMs are not integrated with the global market, the market beta should be insignificant, i.e., an asset's risk is not measured by its covariance with world returns as it would be in the case of full integration. Instead it would be measured by its own variance, as captured by local market returns. If FMs are integrated, then the market beta should be significant. In this case, if our second hypothesis is true, we should expect to find a significant global market β for FMs after 2008.

4. RESULTS

Our DiD analysis provide evidence on changes in portfolio flows to LQ-EMs, FMs and the rest of the LIDCs (NFM-LIDCs). The results from the first step of our DiD analysis (Eq. 1) are shown in Table 4. These illustrate that during 2000–14 portfolio flows to FMs exceeded those to LQ-EMs by 1.4 percentage points of GDP, while portfolio flows to other LIDCs in comparison to EMs have not changed significantly. Here, we are able to demonstrate that (i) the upward trend was similar for both groups; and (ii) the increase has been higher for FMs as a percentage of GDP.

Overall, the results provide answers to the following question: comparing net portfolio flows to two countries after controlling for standard determinants of capital flows, does the country that happens to be an FM (or NFM-LIDCs) observe a significant increase in portfolio flows after 2008 compared to LQ-EMs? The coefficients on our variables of interest are highly significant and robust (Table 4). This result suggests that while FMs are becoming more similar to LQ-EMs in terms of portfolio flows, there is no evidence of a similar trend for the rest of the LIDC group. Including only the push factors (VIX and US bond yield) does not change the results. When controlling for pull factors, we find that FMs' portfolio flows exceed EMs' by 0.62 percent of GDP, less than our initial finding of 1.4 percent.

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Table 4.
Comparison of Portfolio Flows to FMs with EMs

	NPI/GDP							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$Crisis_t$ *$Frontier_i$	1.417**	1.417**	0.623**	0.623**	0.623**	0.876***	0.845***	0.844***
	(*0.6820*)	(*0.6820*)	(*0.2690*)	(*0.2560*)	(*0.2560*)	(*0.2160*)	(*0.2230*)	(*0.2360*)
$Crisis_t$ *NFM_i	0.611	0.611	-0.12	-0.0775	-0.137	-0.129	-0.0902	-0.146
	(*0.6140*)	(*0.6140*)	(*0.2040*)	(*0.1940*)	(*0.1870*)	(*0.2010*)	(*0.1910*)	(*0.1840*)
VIX_t		-0.0363	-0.0219***	-0.0231***	-0.0223***	-0.0210***	-0.0220***	-0.0213***
		(*0.0244*)	(*0.0067*)	(*0.0068*)	(*0.0068*)	(*0.0068*)	(*0.0070*)	(*0.0069*)
U.S 10-Y TB $yield_t$		0.108	-0.0253	0.00238	-0.0303	-0.0265	-0.000221	-0.0312
		(*0.2190*)	(*0.0723*)	(*0.0730*)	(*0.0698*)	(*0.0727*)	(*0.0732*)	(*0.0704*)
$Growth_t$			0.00325	0.0027	0.00367	0.00382	0.00326	0.00417
			(*0.0051*)	(*0.0051*)	(*0.0049*)	(*0.0051*)	(*0.0051*)	(*0.0049*)
$Debt\text{-}to\text{-}GDP_{t-1}$			-3.84E-08	-4.06E-08	-1.75E-08	-3.77E-08	-3.98E-08	-1.84E-08
			(*0.0000*)	(*0.0000*)	(*0.0000*)	(*0.0000*)	(*0.0000*)	(*0.0000*)
$Fiscal\text{-}Balance/GDP_{t-1}$			9.91E-08	1.17E-08	7.70E-08	8.25E-08	-1.30E-09	6.13E-08
			(*0.0000*)	(*0.0000*)	(*0.0000*)	(*0.0000*)	(*0.0000*)	(*0.0000*)
$Current\text{-}Account/GDP_t$				-0.0151**			-0.0144**	
				(*0.0068*)			(*0.0068*)	
$Export\text{-}to\text{-}GDP_t$					-0.0139			-0.0139
					(*0.0169*)			(*0.0170*)
Observations	1,220	1,220	896	896	896	896	896	896
Country FEs	YES	YES	YES	YES	YES	YES	YES	YES
Year FEs	YES	YES	YES	YES	YES	YES	YES	YES
R-squared	0.557	0.557	0.321	0.326	0.324	0.322	0.327	0.325

Notes: The dependent variable is the ratio of (net) portfolio investment liabilities to GDP. The main regressors are: (i) interaction term of a frontier market (= 1 if country i is *FM*) and a time dummy variable that indicates the start of the crisis (= 1 after 2008). All columns include country and year fixed effects. Country observable characteristics push factors and pull factors are added as control variables. Columns (1)–(5) present the baseline specification where FMs are time-invariant. Columns (6)–(8) present the baseline specification where the composition of the FM group is time varying based on countries' qualification dates shown in the first column of Panel A Appendix Table II. All standard errors are clustered at the country-level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Observations are between 2000 and 2014.

The second step of our DiD analysis enables us to document similarities in capital flows to EMs and FMs taking into account the level of global risk aversion. After showing that portfolio flows to FMs have significantly increased, comparable to EMs, we conclude, from the nonsignificant coefficient of the triple interaction term, that after the crisis, FMs' exposure to changes in investor sentiment has become comparable to that of our EM control group (LQ-EMs). The coefficient of the triple interaction term reflects the comparison of portfolio flows to FMs relative to EMs after the crisis both in times of lower or heightened stress in global financial markets (Table 5). Secondly, in the regression including interactions of the FM dummy with each of the years, unsurprisingly the interaction terms involving the pre-crisis years are generally not significant, except for 2007, while for the post-crisis years there are differences (Appendix Table IV). In particular, interactions involving years of heightened stress in global financial markets – 2008, 2009, and 2013, the year of the taper tantrum – are not significant. While there is no evidence of a flow reversal, the finding that portfolio flows appear to have dried out in

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times of financial market stress makes FMs somewhat resemble EMs. These findings provide statistical evidence for increased sensitivity of capital flows into FMs to developments in the global economy, lending support to findings in the earlier literature such as Fratzscher (2012) and Byrne and Fiess (2016).

Table 5.
FM Portfolio Flows' Sensitivity to Global Risk Aversion

	NPI/Y			
	(1)	(2)	(3)	(4)
$Crisis_t$ * FM_t * VIX_t	-0.0425 (*0.0336*)	-0.0425 (*0.0336*)	-0.0462 (*0.0344*)	-0.0490 (*0.0342*)
$Crisis_t$ * FM_t	1.506* (*0.825*)	1.506* (*0.825*)	1.630* (*0.858*)	1.861** (*0.860*)
VIX_t		-0.00106 (*0.0344*)	-0.00129 (*0.0355*)	-0.00887 (*0.0355*)
U.S 10-Y TB $yield_t$		-0.0834 (*0.147*)	-0.0987 (*0.157*)	-0.0609 (*0.0158*)	
$Growth_t$			-0.00283 (*0.0289*)	-0.00638 (*0.0288*)
Fiscal Balance/GDP_{t-1}			0.0348 (*0.0323*)	0.0399 (*0.0322*)
Export/GDP_t				-0.0303** (*0.0138*)
Observations	440	440	428	428
Country FEs	YES	YES	YES	YES
Year FEs	YES	YES	YES	YES
R-squared	0.239	0.239	0.232	0.241

Notes: This table implements a triple interaction DiD estimation using the interaction of risk aversion (proxied by the VIX index), a crisis dummy (= 1 in 2008 and after) and a frontier market dummy. All standard errors are clustered at the country level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Observations are between 2000 and 2014.

Our ICAPM results indicate enhanced market integration for FMs in the post-2008 period, which also implies more pronounced financial vulnerabilities. To document this, we compare FMs' market betas before and after 2008 as well as comparing with those of EMs. First, we find that before 2008 the correlation between FM bond index returns and global bond market returns is insignificant. After 2008 we find a significant and positive relationship between these returns, and FMs' market beta becomes comparable to that of EMs at around 1.7. The econometric results are illustrated inh Table 6; FMs in Panel A and LQ-EMs in Panel B. The results for the periods 2000–08 and 2008–14 are reported separately; labelled as "before" and "after" respectively. Columns 1–4 are populated by the results from single-factor ICAPM regressions; without and with fixed effects. Columns 5 and 6 show the results from two-factor ICAPM regressions. Overall, the findings show that, as portfolio flows to FMs started to become similar to those to EMs after 2008, the comovement between FMs' and global markets' returns has also increased, implying enhanced financial integration and vulnerabilities.

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Table 6.
Changes in Financial Integration for FMs and EMs

	Panel A: ICAPM Frontier Markets					
Variables	(1) BEFORE	(2) AFTER	(3) BEFORE	(4) AFTER	(5) BEFORE	(6) AFTER
$R_t^{mkt} - R_t^f$	0.454	1.716***	0.499	1.716***	0.179	1.121***
	(*0.312*)	(*0.391*)	(*0.322*)	(*0.402*)	(*0.282*)	(*0.323*)
$R_t^{nexgem} - R_t^f$	–	–	–	–	0.339**	0.473***
					(*0.159*)	(*0.127*)
Constant	-0.236	-0.079	-1.035	-0.470	-0.944**	-0.178
	(*0.267*)	(*0.291*)	(*0.648*)	(*0.425*)	(*0.426*)	(*0.284*)
Country FE	–	–	YES	YES	YES	YES
Observations	824	839	824	839	824	839
R-squared	0.008	0.081	0.020	0.088	0.140	0.315
	Panel B: ICAPM Emerging Markets					
Variables	(1) BEFORE	(2) AFTER	(3) BEFORE	(4) AFTER	(5) BEFORE	(6) AFTER
$R_t^{mkt} - R_t^f$	1.373***	1.669***	1.312***	1.656***	0.541**	0.713**
	(*0.332*)	(*0.439*)	(*0.331*)	(*0.450*)	(*0.219*)	(*0.327*)
$R_t^{em\ bi} - R_t^f$	–	–	–	–	0.681***	0.744***
					(*0.0413*)	(*0.0509*)
Constant	-0.246	-0.317	-6.115***	-1.11	-1.117	-0.962
	(*0.288*)	(*0.359*)	(*1.763*)	(*1.799*)	(*1.178*)	(*1.282*)
Country FE	–	–	YES	YES	YES	YES
Observations	702	730	702	730	702	730
R-squared	0.079	0.059	0.135	0.072	0.641	0.531

Notes: The dependent variable is $R_{i,t} - R_t^f$, where i and t stands for country and time, respectively. The estimation uses robust standard errors to allow for correlation across error terms. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Monthly observations are between 2001 and 2014.

Initially, we test for changes in financial integration by using a single-factor CAPM model. For FMs, we find that there is a noteworthy difference in the global market beta before and after 2008. The beta becomes positive and significant in the latter, implying that FMs have become more financially integrated after 2008, while they were segmented from the global markets before. On the other hand, for EMs, the global market beta is positive and significant for both periods, with a slight increase after 2008. Another interesting result we obtain is that the post-2008 market betas for FMs and EMs are of comparable size at approximately 1.7, supporting our view on FMs becoming like EMs in terms of market integration. The magnitude of the coefficient (market beta) is also economically important, implying that a change in international bond returns of 1 percent translates into a 1.7 percent change in FM bond returns after 2008. In this case, assuming a negative shock in global markets that leads to a 1 percent increase in returns, FM bonds will experience an increase of 1.7 percent in returns. Given the nature of bonds, asset prices will move in the opposite direction, i.e., FM bond prices will decrease. As a result, FMs will experience this global shock more severely than advanced markets. As a result, we interpret

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our findings as robust evidence in favor of integration of LQ-EMs (over 2000–14) and post-2008 integration of FMs with the global markets.

The results from two-factor ICAPM regressions support the partial-integration argument, where sub-group bond indices are assumed to proxy for local risk factors and the global index is a proxy for global risk factors. For both FMs and EMs, R^2 values are notably higher than those of single-factor regressions, demonstrating that both local and global factors are priced, but separately. In the FM case, while before 2008 only local factors are priced, after 2008 this is true for both local and global factors. R^2 increases from 8.8 percent to 31.5 percent, and large unexplained variance indicate significant other (omitted) risk factors and idiosyncratic risks. For EMs, local and global factors are significant both before and after 2008, indicating their already partially-integrated nature in the 2000s.[11]

All in all, our findings support enhanced financial integration of FMs. Following the monetary easing and increase in capital flows, we find that FMs moved from full-segmentation to greater integration with the global markets. This finding contrasts with Pukthuanthong and Roll (2009) who find little evidence of FMs' integration in world's financial markets and no evidence that integration has been increasing. This also shows that they resemble EMs in terms of their vulnerability to global shocks and to external risks. This comes as no surprise given that financial integration is often accompanied or preceded by economic integration.

Robustness Tests

We run a number of robustness tests. First, we use an alternative specification that includes a proxy for governance (World Bank's International Country Risk Guide Indicators) to see if changes in governance could be driving the main results, i.e. countries with better governance attract more portfolio flows. These governance indicators are not available for all countries, decreasing the sample size by 50 percent. The regressions follow our baseline setup, including a full set of country and year fixed effects. We find an increase in portfolio flows to FMs of about 0.6 percent of GDP relative to LQ-EMs (Appendix Table V). Our reading of the evidence is that although some results lose significance in some specifications, overall our results are highly robust across different specifications.

We also run regressions in which we compare all LIDCs (FMs and NFM-LIDCs) as a group to LQ-EMs using a DiD test. The results are presented in (Appendix Table VI). These tests illustrate that the coefficients of interest are not statistically significant, i.e., when LQ-EMs are compared with the whole LIDC universe, there is no evidence of increased portfolio flows to LIDCs that would suggest convergence towards, or greater similarity with, EMs in terms of these flows. Our initial findings indicating a similar trajectory between FMs and EMs are specific to FMs. After 2008, private capital flows to FMs have been on a different trajectory from those to the rest of the LIDC group.

Additionally, we test for the suitability of our FM classification, as this might distort our findings. The IMF taxonomy used to identify FMs differs from the developing countries' classification by rating agencies and market analysts in some respects but is robust. As noted above, in the IMF's classification, FMs are first and foremost LIDCs, whereas for market analysts FMs are primarily a subset of EMs though they also include some AEs.[12] A common feature of market analysts' classifications is that they are designed for financial professionals and tend to put more weight on financial accessibility[13] and investment returns while considering other macroeconomic fundamentals that have a bearing on investment returns. By contrast, in the IMF's classification, macroeconomic fundamentals and indicators of financial depth and openness

[11] The literature documents that EMs moved from full-segmentation to partial-integration in the 1990s (Henry, 2000).

[12] Including rating agencies' bond indices—Next Eleven, FTSE, MSCI, Russell, NEXGEM, and EMBI.

[13] Referring to multiple indicators including market depth, liquidity, and openness to foreign investors.

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have a more prominent role as the FMs' selection or qualification criteria. After an exercise aimed at constructing an FMs' group that takes into account both the IMF's taxonomy and the classification by market analysts, we end up with an FMs' group that confirms the robustness of the IMF's classification (Appendix Table III provides details on the exercise).

5. CONCLUSION

Over the past decade, capital flows to FMs increased significantly, reflecting FMs' improved macroeconomic performance and investors' greater interest in these economies. Data shows that this trend was particularly strong after the GFC in 2008, a period of loose monetary policy in major AEs and ample global liquidity. In this paper, based on panel data on EMDCs covering the period 2000–14, we focus on investigating whether FMs resemble EMs in terms of both the trends and patterns portfolio flows, as well as the level of FMs' integration with global financial markets. We use two empirical frameworks for our analysis. First, we use the DiD framework to test for the changing trends in portfolio flows and the patterns of such flows for different EMDCs subgroups. Second, to test for the change in FMs' integration with global markets, we rely on an ICAPM model.

The evidence from our DiD results suggests that, in terms of capital flows, since the 2008 crisis, FMs resemble EMs and that they differ from the rest of LIDCs. FMs' resemblance to EMs after the crisis stems from two findings. First, in terms of the volume of capital flows, portfolio flows to FMs have exceeded those to EMs by about 0.6 percentage points of GDP a year, meaning that FMs have been catching up with EMs. Second, when the level of risk aversion is taken into account, portfolio flows to FMs are not statistically different from those to EMs. The finding suggests that in times of heightened stress in global financial markets FMs are just as vulnerable as EMs to portfolio flows drying up or being reversed. This was observed in 2008, 2009, and in 2013, the year of the taper tantrum.

Our findings from the ICAPM analysis complements the results from the DiD in two respects. First, they suggest that FMs were not integrated with global financial markets by the time of the 2008 GFC, confirming why FMs largely escaped the turmoil in global markets and lending support to the finding of a significantly higher increase in portfolio flows relative to those to EMs only after the crisis. Second, there has been a shift in FMs' integration with global financial markets after the crisis, reflected by their market beta becoming positive and significant. This sign of greater comovement between FMs' and global markets' returns points to a new risk of increased vulnerability to changes in global market conditions and capital reversals that these economies face.

The results suggest that there has been a change in the landscape of capital flows to developing countries that may have policy implications. The finding of FMs' greater vulnerability to adverse developments in global financial markets points to the importance having in place frameworks for FMs to manage vulnerabilities to capital flow reversals and cope with such reversals that could jeopardize macroeconomic performance.

There are a number of caveats in our paper. First, the study's conclusions are based on changes that have occurred during a relatively short period of unusually lax monetary conditions in major AEs. As such, they may not reflect a permanent shift in the way FMs compare to EMs. Also, identifying FMs in our sample, might entail a certain level of sample bias to the extent that the selection of FMs is not random. However, controlling for other determinants of portfolio flows, as done in our regressions, mitigates this bias. Moreover, the selection does not drive our findings, which are interesting and quite intuitive. Additionally, in our tests of financial market integration, we are not able to include all FMs in our regressions, as the bond return data is not available. A larger sample size would have improved the robustness of our findings. As we do not provide

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any indication of what the shifts imply for either FMs' financing needs or the framework for strengthening resilience to adverse external financial shocks, there is room for further research on the policy implications of our findings.

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APPENDIX

Technical Appendix. Econometric Framework and Identification Strategy

This section will provide an overview of the underlying assumptions for our empirical strategy. Let us first rewrite a simplified version Equation 1:

$$\frac{NPI_{i,t}}{Y_{i,t}} = \beta_0 LIDC_{i,t} + \beta_1 Crisis_t + \beta_2 FM_{i,t} + \beta_3 FM_{i,t} * Crisis_t + \\ + \beta_4 NFM_{i,t} * Crisis_t + \gamma X_{i,t} + u_{i,t} \tag{E1}$$

We define the LIDCs eligibility assignment set $\varepsilon_t \equiv \{i \in \mathcal{I} : LIDC_{i,t} = 1\}$. The complement of ε_t, ε_t^C is the control assignment set. Let F_t^- be the frontier of some set F_t. Then,

$$B_t \equiv \bar{\varepsilon}_t \cap \varepsilon_t^C \tag{E2}$$

we define the lower bound of EMs B_t as:

We define three groups by their distance to ad-hoc cutoffs.

Let $B_{h^+,t} \equiv B_{h,t} \cap \varepsilon_t, B_{h^-,t} \equiv B_{h,t} \cap \varepsilon_t^C, B_{h^{--},t} \equiv \varepsilon_t \cap B_{h^-,t}$ be the lower bound of the EMs and the FMs and the LIDC non-FMs countries, respectively.

The idea of the methodology used in this paper is to compare the outcome (i.e., portfolio investments) while controlling for the cross-sectional variation between countries and the time series variation. Using the diff-in-diff, our estimators take into account any permanent, i.e., time-invariant, difference between the treatment groups (FMs and NFM-LIDCs) and the control group (lower bound of EMs) by the inclusion the $FM_{i,t}$, $LIDC_{i,t}$ and $NFM_{i,t}$. Further, any common trend affecting both groups is also differentiated away by the inclusion of $Crisis_t$. In sum, treat for endogeneity issues cannot come from either permanent differences between the control and the treatment groups, or shared trends.

Consider each group of countries and denote τ the conditional expectation of equation E1. We have:

- EMs, $\beta_{h^+,t}$: $LIDC_{i,t} = 0$, $Frontier_{i,t} = 0$, $NFM_{i,t} = 0$

$$\tau^{Before} = E\left(Y_{i,t} \mid Crisis_t = 0, X_{i,t}\right) = \gamma X_{i,t} \tag{E3}$$

$$\tau^{After} = E\left(Y_{i,t} \mid Crisis_t = 1, X_{i,t}\right) = \beta_1 + \gamma X_{i,t} \tag{E4}$$

(E4) – (E3) is the effect of the crisis on the EMs control group = β_1. Adding $X_{i,t}$ allows us to diminish the endogeneity concern that these countries' capital flows would have changed over the period of observation even if the financial crisis had not been here.

- FMs, $\beta_{h^-,t}$: $LIDC_{i,t} = 1$, $Frontier_{i,t} = 1$, $NFM_{i,t} = 0$

$$\tau^{Before} = E\left(Y_{i,t} \mid Crisis_t = 0, X_{i,t}\right) = \beta_0 + \beta_2 + \gamma X_{i,t} \tag{E5}$$

$$\tau^{After} = E\left(Y_{i,t} \mid Crisis_t = 1, X_{i,t}\right) = \beta_0 + \beta_1 + \beta_2 + \beta_3 + \gamma X_{i,t} \tag{E6}$$

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(E6) – (E5) is the effect of the crisis on the FMs = $\beta_1 + \beta_3$. Adding $X_{i,t}$ allows us to diminish the endogeneity concern that these countries' capital flows would have changed over the period of observation even if the financial crisis had not been here.

- LIDCs Non-FMs: $LIDC_{i,t} = 1$, $Frontier_{i,t} = 0$, $NFM_{i,t} = 1$

$$\tau^{Before} = E\left(Y_{i,t} \middle| Crisis_t = 0, X_{i,t}\right) = \beta_0 + \gamma X_{i,t} \quad \text{(E7)}$$

$$\tau^{After} = E\left(Y_{i,t} \middle| Crisis_t = 1, X_{i,t}\right) = \beta_0 + \beta_1 + \beta_4 + \gamma X_{i,t} \quad \text{(E8)}$$

(E8) – (E7) is the effect of the crisis on the NFM-LIDCs = $\beta_1 + \beta_4$. Adding $X_{i,t}$ allow us to diminish the endogeneity concern that these countries' capital flows would have changed over the period of observation even if the financial crisis had not been here. Further, the vector $X_{i,t}$ improves the efficiency of our estimators (Roberts and Whited, 2012).

Our strategy addresses the secular trends by examining the outcomes (i.e., Portfolio Investments) for similar groups of countries that are less likely to receive the "treatment" but share broadly similar influence to the trending variables. Compared to our control group for EMs, one would expect to see a sharp change in capital flows for the FMs following 2008, this approach is called the difference-in differences (DiD). In our context, the DiD estimator for FMs countries is obtained by differentiating (E6 – E5) and (E4 – E3) which yields β_3.

Table I.
List of Low Income Developing Countries (LIDCs)
This table illustrates all countries classified as low-income and developing (LIDCs) by the IMF (as of 2014). LIDCS are defined as countries that can benefit from IMF's Poverty Reduction and Growth Trust as of 2013 and have a per capita Gross National Income (GNI) less than twice the IDA cut-off point or US$2,390 for 2013).

Afghanistan	Guinea	Niger
Bangladesh	Guinea-Bissau	Nigeria
Benin	Haiti	Papua New Guinea
Bhutan	Honduras	Rwanda Senegal
Bolivia	Kenya	Sierra Leone
Burkina Faso	Kiribati	Solomon Islands
Burundi	Kyrgyz Republic	Somalia
Cambodia	Lao P.D.R.	South Sudan
Cameroon	Lesotho	Sudan
Central African Republic	Liberia	Sao Tome and Príncipe
Chad	Madagascar	Tajikistan
Comoros	Malawi	Tanzania
Congo, Democratic Republic of the	Mali	Togo
Congo, Republic of	Mauritania	Uganda
Côte d'Ivoire	Moldova	Uzbekistan
Djibouti	Mongolia	Vietnam
Eritrea	Mozambique	Yemen
Ethiopia	Myanmar	Zambia
Gambia, The	Nepal	Zimbabwe
Ghana	Nicaragua	

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Table II.
Countries' Sub-Groups

This table illustrate developing countries' sub-groups used in this paper for analytical purposes. In Panel A, the first column shows the list of FMs and, besides each country, the year in which it met the FMs classification criteria. The second column shows the EMs in our control group. Panel B presents the subgroups used in our financial integration (ICAPM) analysis.

Panel A	
FMs	EMs (Control Group)
Bangladesh (2010)	Angola
Bolivia (1997)	Armenia
Côte d'Ivoire (2010)	Egypt
Ghana (1997)	El Salvador
Kenya (1996)	Fiji
Mongolia (2008)	Georgia
Mozambique (1999)	Guatemala
Nigeria (1998)	Indonesia
Papua New Guinea (2003)	Kosovo
Senegal (2009)	Morocco
Tanzania (2010)	Paraguay
Uganda (2010)	Sri Lanka
Vietnam (2008)	Swaziland
Zambia (1998)	Syria
(Honduras)	Tunisia
	Ukraine

Panel B	
FMs	EMs
Bolivia	Angola
Ghana	Egypt
Côte d'Ivoire	El Salvador
Senegal	Georgia
Tanzania	Indonesia
Vietnam	Morocco
Zambia	Paraguay
Nigeria	Sri Lanka
Kenya	Tunisia
Mongolia	Guatemala
Honduras	Ukraine
Mozambique	

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Table III.
Deriving a Frontier Market Group Combining IMF and Market Analysts' Classifications

This table illustrates the results from robustness checks conducted for FM country classification. To construct an FM group that takes into account IMF's and market analysts' classification, for each country that does not exceed the income threshold separating LMIC from UMIC, the classification by each of the market analysts or the IMF takes discrete values of -1, 1, and 0, when the country is classified as an EM, an FM, or neither, respectively. As we are more interested in macroeconomic fundamentals, the IMF's classification is assigned the same weight as all the market analysts together while individually, market analysts are assigned equal weights. For a country, if the overall weighted average rating is at least 0.5, it means that either the IMF's characterization of the country as FM is confirmed or that market analysts overwhelmingly classifies the country as an FM even when the IMF considers it to be a NFM-LIDC. Yellow highlights indicate country is not FM while green highlights indicate country is FM after taking into account IMF and market analysts' classifications.

Country	IMF	Next Eleven	FTSE	MSCI	Russell	NEXGEM	EMBI	Weighted average rating (WaR)	Classification, FM = 1 if WaR ≥ 0.5
Indonesia	-1	-1	-1	-1	-1		-1	-0.917	0
Egypt	-1	-1	-1	-1	1	1	-1	-0.667	0
Angola	-1	0	0	0	0	1	-1	-0.500	0
El Salvador	-1	0	0	0	0	1	-1	-0.500	0
Fiji	-1	0	0	0	0	0	0	-0.500	0
Guatemala	-1	0	0	0	0	1	-1	-0.500	0
Kosovo	-1	0	0	0	0	0	0	-0.500	0
Paraguay	-1	0	0	0	0	1	-1	-0.500	0
Swaziland	-1	0	0	0	0	0	0	-0.500	0
Syria	-1	0	0	0	0	0	0	-0.500	0
Armenia	-1	0	0	0	0	1	0	-0.417	0
Georgia	-1	0	0	0	0	1	0	-0.417	0
Ukraine	-1	0	0	1	1	0	-1	-0.417	0
Morocco	-1	0	1	1	1	0	-1	-0.333	0
Tunisia	-1	0	1	1	1	0	-1	-0.333	0
Sri Lanka	-1	0	1	1	1	1	-1	-0.250	0
Bolivia	1	0	0	0	0	1	-1	0.500	1
Mongolia	1	0	0	0	0	1	-1	0.500	1
Papua New Guinea	1	0	0	0	0	0	0	0.500	1
Tanzania	1	0	0	0	0	1	-1	0.500	1
Uganda	1	0	0	0	0	0	0	0.500	1
Mozambique	1	0	0	0	0	1	0	0.583	1
Senegal	1	0	0	0	1	1	-1	0.583	1
Zambia	1	0	0	0	1	1	-1	0.583	1
Honduras	0	0	0	0	0	1	0	0.083	0
Bangladesh	1	-1	1	1	1	0	0	0.667	1
Côte d'Ivoire	1	0	1	0	1	1	-1	0.667	1
Nigeria	1	-1	1	1	1	1	-1	0.667	1
Vietnam	1	-1	1	1	1	1	-1	0.667	1
Ghana	1	0	1	1	1	1	-1	0.750	1
Kenya	1	0	1	1	1	1	0	0.833	1

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Table IV.
Robustness Checks: Investigating Treatment Effects per year

The regressions in this table replicate the specifications of the main results, with the exception that FM or NFM-LIDC are interacted with time dummies for each year. All columns include country and year fixed effects. The table shows only the interactions of FM with year dummies. All standard errors are clustered at the country level, allowing for autocorrelation across time and within the country. Observations are between 2000 and 2014. *** p < 0.01, ** p < 0.05, * p < 0.1.

	NPI/Y			
	(1)	(2)	(3)	(4)
(year==2001)*$FM_{i,t}$	0.304	0.304	0.304	0.263
	(0.532)	(0.532)	(0.571)	(0.567)
(year==2002)*$FM_{i,t}$	0.167	0.167	0.230	0.203
	(0.530)	(0.530)	(0.568)	(0.564)
(year==2003)*$FM_{i,t}$	0.188	0.188	0.273	0.235
	(0.530)	(0.530)	(0.567)	(0.563)
(year==2004)*$FM_{i,t}$	-0.430	-0.430	-0.357	-0.399
	(0.530)	(0.530)	(0.566)	(0.562)
(year==2005)*$FM_{i,t}$	0.101	0.101	0.211	0.198
	(0.530)	(0.530)	(0.565)	(0.561)
(year==2006)*$FM_{i,t}$	0.101	0.101	0.217	0.196
	(0.530)	(0.530)	(0.564)	(0.560)
(year==2007)*$FM_{i,t}$	1.243**	1.243**	1.357**	1.276**
	(0.530)	(0.530)	(0.565)	(0.560)
(year==2008)*$FM_{i,t}$	0.0197	0.0197	0.128	0.122
	(0.530)	(0.530)	(0.565)	(0.560)
(year==2009)*$FM_{i,t}$	0.0151	0.0151	0.128	0.121
	(0.530)	(0.530)	(0.564)	(0.560)
(year==2010)*$FM_{i,t}$	1.169**	1.169**	1.286**	1.237**
	(0.530)	(0.530)	(0.565)	(0.560)
(year==2011)*$FM_{i,t}$	1.115**	1.115**	1.232**	1.166**
	(0.531)	(0.531)	(0.565)	(0.561)
(year==2012)*$FM_{i,t}$	2.045***	2.045***	2.150***	1.981***
	(0.531)	(0.531)	(0.565)	(0.561)
(year==2013)*$FM_{i,t}$	0.303	0.303	0.380	0.270
	(0.531)	(0.531)	(0.565)	(0.561)
(year==2014)*$FM_{i,t}$	1.254**	1.254**	1.358**	1.302**
	(0.531)	(0.531)	(0.566)	(0.561)
Observations	1,040	1,040	1,002	1,002
R-Squared	0.233	0.233	0.232	0.242
F tests on equality of coefficients				
F-stat 2008=2011	2.91	2.91	3.06	2.78
p-val 2011	0.0549	0.0549	0.0474	0.0628
F-stat 2008=2012	9.88	9.88	9.77	8.34
p-val 2012	0.0001	0.0001	0.0001	0.0003
F-stat 2008=2013	0.21	0.21	0.24	0.12
p-val 2013	0.8137	0.8137	0.7861	0.8889

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Table V.
Robustness Check: Controlling for Governance

The regressions in this table serve as a robustness check of the main results presented in Table 2. The specifications are somewhat modified and one regression specifically includes the quality of governance among the regressors. All columns include country and year fixed effects. All standard errors are clustered at the country level, allowing for autocorrelation across time and within the country. Observations are between 2000 and 2014. *** p < 0.01, ** p < 0.05, * p < 0.1.

	NPI/Y			NPI/Y		
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Crisis$_t$*Frontier$_t$	0.674*	0.649*	0.632**	0.630**	0.647**	0.638**
	(0.374)	(0.374)	(0.279)	(0.281)	(0.273)	(0.276)
Crisis$_t$*NFM$_t$	-0.284	-0.235	-0.316	-0.318	-0.322	-0.315
	(0.287)	(0.287)	(0.273)	(0.275)	(0.281)	(0.277)
VIX$_t$		-0.00936	-0.0126	-0.0299***	-0.0131	-0.0301***
		(0.00837)	(0.00974)	(0.00811)	(0.00987)	(0.00837)
U.S 10-Y TB yield$_t$		-0.379**	-0.279***	-0.155*	-0.262**	-0.143*
		(0.147)	(0.101)	(0.0794)	(0.104)	(0.0798)
Growth$_t$		0.892	1.122*	1.270**	1.071*	1.259**
		(0.696)	(0.597)	(0.571)	(0.604)	(0.592)
Debt/GDP$_{t-1}$			-1.57e-06***	-1.59e-06***	-1.60e-06***	-1.63e-06***
			(5.16e-07)	(4.78e-07)	(5.57e-07)	(5.08e-07)
Fiscal-Balance/GDP$_{t-1}$			-5.87e-06	-4.62e-06	-6.82e-06	-5.44e-06
			(5.02e-06)	(5.12e-06)	(7.81e-06)	(7.70e-06)
Governance*t*					0.00774	0.00146
					(0.0158)	(0.0164)
Country Fixed Effects	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES
Observations	731	682	580	580	571	571
R-squared	0.164	0.199	0.188	0.221	0.188	0.222

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Table VI.
Robustness Check: Investigating the Difference of all LIDCs with EMs

The regressions in this table serve to investigate whether, compared to the LQ-EMs, all LIDCs are affected differently in term portfolio investments. The dependent variable is the ratio of (net) portfolio investment liabilities to GDP. The main regressors are: (i) interaction term of the dummy variable *LIDC* (= 1 if country i is part of the LIDC group) and a time dummy variable that indicates the start of the crisis (= 1 after 2008). All columns include country and year fixed effects. Country observable characteristics, push and pull factors are added to control for capital flow determinants. All standard errors are one-way clustered at the country level. Observations are between 2000 and 2014. *** p < 0.01, ** p < 0.05, * p < 0.1.

	NPI/Y			NPI/Y	
	(1)	(2)	(3)	(4)	(5)
$Crisis_t^*LIDC_t$	1.569 (1.380)	1.569 (1.380)	0.0118 (0.236)	-0.00923 (0.234)	0.0544 (0.226)
VIX_t		-0.0549 (0.0404)	-0.0196** (0.00756)	-0.203*** (0.00766)	-0.0208*** (0.00769)
U.S 10-Y TB $yield_t$		0.331 (0.438)	-0.0515 (0.0939)	-0.0289 (0.0935)	-0.0470 (0.0954)
$Growth_t$			0.00313 (0.00533)	0.0259 (0.00529)	0.00350 (0.00509)
$Debt/GDP_{t-1}$			2.05e-08 (5.62e-08)	1.05e-08 (5.27e-08)	4.61e-08 (5.02e-08)
Fiscal $Balance/GDP_{t-1}$			9.12e-08 (1.16e-07)	5.44e-09 (1.21e-07)	6.74e-08 (1.15e-07)
Current $Account/GDP_t$				-0.0155** (0.00695)	
$Export/GDP_t$					-0.0140 (0.0167)
Observations	1,220	1,220	896	896	896
Country FEs	YES	YES	YES	YES	YES
Year FEs	YES	YES	YES	YES	YES
R-squared	0.561	0.561	0.313	0.318	0.316

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