Bank of Finland Research Discussion Papers
2 • 2026

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Bank of Finland
Research

Bank of Finland Research Discussion Papers
Editor-in-Chief Esa Jokivuolle

Bank of Finland Research Discussion Papers 2/2026
22 January 2026

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ISSN 1456-6184, online

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Pyrrhic Diversification:

Foreign Institutional Ownership and Stock Return Sensitivity to the Global Financial Cycle[1]

December 2025

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Abstract

We demonstrate that foreign institutional ownership (FIO) is associated with stronger stock return sensitivity to the Global Financial Cycle (GFC), indicating greater global co-movement among stocks selected by FIOs compared to those not selected. We conjecture that this may be because (i) FIOs tend to pick *ex-ante* very similar firms when investing abroad, or (ii) FIO investments itself makes firms *ex-post* more similar and more sensitive to the GFC. We find evidence in support of both hypotheses: that the increased co-movement may be due to FIO's selecting more homogeneous firms and that the sensitivity to the GFC increases after FIO investment. However, we find no significant difference between firms that have longer exposure to FIO investors and those that have only recently obtained FIO investment. Our results indicate that diversification gains are left on the table when FIOs select firms to invest in.

JEL Codes: E44, F21, F30, G15.

Keywords: Foreign institutional ownership, Global Financial Cycle, co-movement, diversification gains.

[1] The views and opinions expressed in the paper are those of the authors and do not necessarily represent those of the Bank of Finland.

Introduction

One of the main reasons for and advantages of investing abroad is diversification. While foreign investors may be at a disadvantage regarding local conditions and *soft* information about firm fundamentals in other countries, the risks that these firms are exposed to are very likely to be different from the risks they already hold in their portfolios. Nevertheless, a large literature has shown that asset prices around the world still co-move to some extent. Rey (2015) and Miranda-Agrippino and Rey (2020) refer to the common factor driving this global co-movement as the Global Financial Cycle (henceforth, GFC). From an international investor's risk management perspective, the GFC is a non-diversifiable risk, and it would be desirable to minimize the exposure of one's global portfolio to it. We investigate whether this is indeed the case for a key class of global investors, namely foreign institutional investors (henceforth FIOs).

We assess the sensitivity of firm's stock returns to measures of the GFC, such as the volatility of the S&P 500 index (VIX). The GFC literature suggests a negative correlation between them, implying a negative spillover effect from the US stock market volatility on the price of stocks globally. We find that foreign institutional ownership in firms around the world is associated with stronger stock return sensitivities to the GFC. In response to a one standard deviation deterioration in global financial conditions, as captured by multiple GFC measures, we find that the stock returns of firms with full foreign institutional ownership decline by approximately 1.8 to 2.2 percentage points more than those of firms without such ownership. This magnitude is economically meaningful. For comparison, the average annual return on international equities during 1870 to 2015 is about 7 percent per year (Jordà et al., 2019).

We find that the effect we document is present for both the stock returns of US and non-US firms. Moreover, consistent with the notion that the VIX and other measures of the GFC have origins in the US, we find more potent effects on US firms. We also verify whether we obtain the same results for FIOs that are based in the US and those that are not. The results indicate that the presence of non-US FIOs is also associated with amplified effects of the GFC on stock returns. We run our baseline specification for sub-samples covering crisis and non-crisis periods. The crisis period is defined as covering the years 2007-2009 for the Global Financial Crisis and the period 2009-2013 for the European Sovereign Debt Crisis. We find that the effect we document is indeed more significant during crisis years.

Next, we investigate whether this is due to FIOs selecting firms that are ex-ante more similar and would therefore co-move more, or whether FIOs in firms result in these firms becoming more sensitive to the GFC or more similar *ex-post* potentially also because of FIOs' influence on firm behavior. The distinction between the two hypotheses matters significantly and would have different implications.

Firms with FIO investment may be more sensitive to the GFC because of certain features that make them appealing for FIOs in the first place. That is, they are *ex-ante* more sensitive to the GFC. For instance, FIOs tend to pick the same (types of) firms when investing abroad (see e.g., Barberis and Shleifer, 2003; Barberis et al., 2005; Covrig et al. 2006). If this is the case, then this would suggest that such FIO behavior leads to under-diversification. Moreover, FIOs can improve the diversification benefits of investing in foreign firms by picking firms differently than before.

Moreover, similarities in the investment strategy of FIOs which would lead them to pick the same firms could, in turn, expose FIOs to increased liquidity commonality risk (see e.g., Deng et al., 2018 and Karolyi et al., 2012, among others) – whereby

common exposure to a global shock (GFC) is amplified by correlated trading on similar securities by foreign institutional investors. This leads us to consider the second channel whereby FIO investments themselves can make stock returns more sensitive to the GFC *ex-post.*

Another dimension to the second channel is that FIOs may exert (positive) influence on the behavior of firms. See, for example, Baghdadi et al. (2018) on managerial efficiency, Aghion et al. (2013) and Luong et al. (2017) on firm innovation, Aggarwal et al. (2011) and Boone and White (2015) on transparency and governance, Fang et al. (2015) and Kim et al. (2019) on accounting practices, and Bena et al. (2017) on long-termism. This implies that, even if firms would be *ex-ante* heterogeneous and equally likely to be sensitive to the GFC, *ex-post* to FIO investment, they would gradually behave more similarly thereby increasing their sensitivities to common risk factors. If this is the case, then the nature of FIO investment itself gradually undoes the diversification gains from investing in foreign firms. That is, even if FIO investment initially results in diversification benefits, over time, and due to FIO influence, these diversification gains are eroded, and it may be more difficult for FIOs to diversify risk in this scenario.

We find evidence in support of the first hypothesis, that FIOs tend to pick firms that are more similar and already more sensitive to the GFC prior to FIO investment. We also find some evidence in support of the second hypothesis. Specifically, firm stock returns become more sensitive to the GFC after FIO investment. However, we do not find evidence that prolonged exposure to FIO investment increases stock return sensitivities to the GFC. These results do not support the notion that FIO influence on firm behavior can increase sensitivity to global risk factors but are in favor of liquidity commonality and investor portfolio mechanisms as potential main drivers of the second

channel. As such, our results indicate that FIOs who seek to diversify their portfolios by investing in firms across different countries worldwide may end up less diversified due to the above channels – a pyrrhic diversification – at least with respect to a common risk factor, the GFC.

Finally, we conduct a series of robustness tests to validate our main results. First, our findings remain qualitatively unchanged when we include country fixed effects or country and date two-way clustered standard errors. Second, we observe no significant differences in the effect between foreign investors originating from common-law and civil-law jurisdictions. Third, the results are robust to excluding penny stocks with prices below $5. Fourth, the key conclusions remain after additionally controlling for the focal country's exchange rate movements and GDP growth.

Our study makes several important contributions to the literature. First, we advance research on non-diversifiable risks in global equity markets by focusing on firms' exposure to the GFC. The classic work of Calvo, Leiderman, and Reinhart (1996) shows how international monetary spillovers and interest rates drive the capital flows and credit cycles. Recent work by Engle and Campos-Martins (2023) highlights a form of global financial risk arising from co-movements with aggregate market volatility and documents its significant implications for global asset pricing. Complementarily, Miranda-Agrippino and Rey (2020, 2022) propose an alternative measure of the GFC linked to the US monetary policy and global risk appetite. Building on this foundation, our study offers novel evidence on foreign institutional ownership as a potential transmission and amplification channel, showing that firms with higher FIO presence are more exposed to global financial shocks, particularly during periods of financial stress. This finding introduces a previously underexplored channel through which foreign ownership can increase firm-level vulnerability to global market volatility. In

doing so, our study complements existing literature that has largely emphasized other risk dimensions – such as geopolitical risk (Ambrocio, Hasan, and Li, 2024) – and contributes a new perspective on the unintended consequences of international capital flows.

Moreover, our study complements the literature on the transmission channels of the GFC. Miranda-Agrippino and Rey (2020, 2022) propose that US monetary policy shocks may be a main driver in the observed co-movement in asset prices around the world. In a related study, di Giovanni et al. (2022) show that global financial fluctuations impact domestic credit conditions primarily through domestic banks' exposure to international funding markets whle di Giovanni and Hale (2022) emphasize the importance of global production networks in the transmission of important drivers of global financial conditions such as US monetary policy. Firms themselves, may opt to globally diversify their operations increasing their exposure to global conditions (see e.g., Denis et al., 2002, Errunza and Senbet, 1981, and Mihov and Naranjo, 2019 for some examples also with implications on firm valuation). In contrast, we highlight a distinct transmission channel by demonstrating that global financial volatility can influence domestic equity markets through the portfolio decisions of foreign institutional investors. Specifically, we use granular firm-investor level data and show that firms with higher foreign institutional ownership exhibit greater sensitivity to global financial shocks, underscoring the role of cross-border equity flows in propagating external financial conditions into domestic markets. This distinction broadens the understanding of how global risk factors affect emerging and developed economies beyond the traditional banking-sector channel.

Second, our study contributes to the literature on global portfolio allocation by shedding light on how foreign institutional investors make investment decisions in

international markets – a topic that has received limited attention due to data constraints. Leveraging granular investor-firm-month-level data, we document that foreign institutional investors exhibit a preference for stocks that share similar characteristics with their existing portfolios, consistent with a strategy of within-portfolio conformity. This selection behavior has several underexplored implications. Notably, we find that firms with higher foreign institutional ownership are more sensitive to global financial cycles, indicating that these investors may amplify the transmission of global shocks to local markets. Furthermore, we show that foreign institutional investors exhibit relatively little impact on their holding stocks, and that many of the associated effects attenuate over time. This persistence suggests potential inefficiencies in the global diversification strategies employed by institutional investors. These findings offer novel insights into the dynamics of international capital flows and open new avenues for research on the constraints and frictions shaping global portfolio choices.

The rest of the paper is organized as follows. Section 2 provides a brief review of the literature. Section 3 describes the data and empirical methodology we employ. Section 4 reports our findings, and finally, Section 5 concludes with a few remarks.

1. Related Literature

A substantial body of literature exists on identifying the sources of stock co-movement globally.[2] For instance, Albuquerque and Vega (2009) have earlier documented evidence that global fundamental factors can induce co-movement in stock returns. Brooks and Del Negro (2006) identify real linkages (i.e., trade) as an important source

[2] See Coeurdacier and Rey (2013) for an early review of the literature concerning international asset allocations as well as the seminal work of French and Poterba (1991) regarding investor diversification and the home bias.

of stock market co-movement. More recently, Rey (2015) and Miranda-Agrippino and Rey (2020) identify a global common factor to asset prices, also in assets outside of stock markets, and point towards developments in the United States of America as a key driver of this common factor referred to as the Global Financial Cycle.[3]

Focusing on FIOs, Faias and Ferreira (2017) find that, when stock returns are decomposed into global, country, and industry factors, FIO ownership is associated with a stronger influence from global and industry factors, indicating stronger co-movement along these dimensions as well. On the other hand, Deng, Li, and Li (2018) find a negative link between FIO and stock liquidity commonality while Doering et al. (2021) find that FIOs, particularly those with with short-term investment horizons, enhances firm value. Our results support the notion that FIO investment is associated with stronger co-movement, specifically in terms of stock return sensitivity to the GFC.

Our investigation into whether FIOs select similar firms *ex-ante* builds on the literature documenting the factors behind FIO portfolio choice. Didier, Rigobon, and Schmuckler (2013) have previously documented evidence that international mutual funds invest in only a few stocks (approximately 100) and are insufficiently diversified. They find that this under-diversification is not (entirely) driven by sector focus, information constraints, transaction costs, or tail risks but rather indicates that organizational preferences may play an important role. Anderson et al. (2011) and Beugelsdijk and Frijns (2010) show that cultural factors among institutional investors also affect the degree to which their portfolios are diversified. Aggarwal, Klapper, and Wysocki (2005) investigate the way that US mutual funds allocate their foreign portfolio investments and find that these funds prefer foreign stocks that tend to be more transparent (e.g., better accounting transparency, in countries with stronger accounting

[3] Recently, Jiang (2025) find that reliance on international borrowing from China leads to lower exposure to the GFC.

standards, legal frameworks, and shareholder rights). An earlier study by Dahlquist and Robertsson (2001) looking at foreign ownership among Swedish firms also find that foreign institutional investors tend to pick large firms with large cash holdings and that tend to have a presence in international markets. These are consistent with the findings in Gompers and Metrick (2001), which also indicate that institutional investors prefer large firms as well as Covrig et al. (2006) who find that foreign funds prefer firms with broader analyst coverage and which are more globally recognized and visible. Massa and Zhang (2018) show that corporate hedging activity tend to attract FIOs, particularly for firms in less transparent environments. Ferreira and Matos (JFE 2008) also show that global institutional investors have strong preferences for particular types of stocks – primarily large firms with good governance (i.e., more transparency).

These findings in the literature point toward information (dis-)advantages as a key motivating factor behind FIO investment allocations.[4] This assertion is directly supported by findings in Kalev, Nguyen, and Oh (2008), who show that local investors have short-term trading advantages relative to foreign investors in support of the information disadvantage of foreign investors, and Kim, Hwang, and Kim (2023), who provide evidence from securities class actions that local investors have an information advantage. Moreover, Ferreira et al. (JBF 2017) compare local and foreign institutional investor trading patterns to provide evidence consistent with an information advantage for local institutions. Our results indicate that, as a consequence of these FIO investment allocation preferences, their exposure to the GFC is much stronger than it would otherwise be.

[4] Van Niewerburgh and Veldkamp (2010) show in a model that information costs can endogenously generate asymmetries in information between local and foreign investors, ultimately resulting in under-diversification. See e.g., Coval and Moskowitz (2001) for earlier studies documenting home bias and linking it to informational (dis)advantages.

Our exploration of the second hypothesis, whereby FIO investment affects firm behavior, which in turn makes their stock returns more sensitive to the GFC ex-post, is motivated by the literature on FIO influence. FIO investment can promote innovation and productivity growth among firms (Aghion, Van Reenen, and Zingales, 2013; Luong et al., 2017; Bena et al., 2017), improve governance (Chung and Zhang, 2011; Borochin and Yang, 2017; Dyck et al., 2019), transparency (Boone and White, 2015), lead to a convergence in accounting practices (Fang et al., 2015; Kim et al., 2019), lower future crash risk (Aggarwal et al., 2011; Callen and Fang, 2013), and also managerial efficiency (Baghdadi et al., 2018). This mechanism would imply that the increase in sensitivity would gradually materialize over time.

However, other mechanisms can also generate more immediate increases in sensitivities to the GFC following FIO investment. Commonality in investor portfolios can generate increased co-movement of stock returns. For instance, Bartram et al. (2015) provide evidence that foreign ownership induces co-movement among stocks with common shareholders. Moreover, Manconi, Massa, and Yasuda (2012) show that institutional investment is an important transmission channel for risks and was a source of contagion in the corporate bond market during the US subprime mortgage crisis of 2007. Similarly, Broner, Gelos, and Reinhart (2006) provide evidence that FIO portfolio rebalancing constitutes an important source of contagion in stock markets.

All or some of the mechanisms outlined above could lead firms' stock returns to co-move and be more sensitive to the GFC following FIO investments. Our results provide support for some of these mechanisms. Specifically, we find evidence in support of a more immediate increase in sensitivities to th GFC and we do not find this sensitivity to increase over time. As such, our findings support the notion that the liquidity and portfolio commonality mechanisms may be at work whilst FIO influence

on firm behavior over time may not be relevant for increased sensitivities of firm stock returns to the GFC.

2. Data and Method

3.1 Data

We begin with institutional ownership data obtained from FactSet, covering the period from 2007 to 2019. This dataset is merged with monthly stock return data from the Global Compustat Security files. Firm-level covariates, including financial and accounting variables, are sourced from Global Compustat Fundamental. To incorporate country-level characteristics, we use macroeconomic and institutional indicators from the World Bank's World Development Indicators (WDI) database.

We construct three measures of the global financial cycle: *VIX*, *EBP*, and *MGFC*. VIX is the VIX (or fear) index from the Chicago Board Options Exchange (CBOE). EBP is the excess bond premium proposed by Gilchrist and Zakrajsek (2012) and extended in Gilchrist et al. (2022). Finally, MGFC is the common factor GFC introduced by Miranda-Agrippino and Rey (2020).[5]

The VIX reflects the market's expectation of volatility derived from S&P 500 index options and is widely known as the "fear gauge" (Ambrocio, Hasan, and Li, 2024). It serves as a proxy for global risk aversion and uncertainty. A rise in the VIX, indicating heightened volatility in US equity markets, is typically associated with negative spillovers to global asset prices; its negative correlation with international stock returns effectively captures the strength of the GFC. EBP is a measure derived

[5] Appendix Table A.3 shows the correlation matrix among GFC measures. We find that VIX is positively associated with EBP and is negatively associated with MGFC. Similarly, the change in VIX is positively (negatively) associated with the change in EBP (MGFC).

from US corporate bond spreads over risk-free rates, originally proposed by Gilchrist and Zakrajšek (2012). It serves as an indicator of financial market stress and the risk-bearing capacity of US financial intermediaries. Elevated EBP levels are associated with significant contractions in consumption, investment, and output, making it a valuable measure of systemic financial distress. Finally, we make use of the common factor MGFC from Miranda-Agrippino and Rey (2020). Together, these measures offer a comprehensive view of global financial conditions and their transmission across borders.

Our dataset comprises 850,954 firm-month observations from 9,642 unique firms across 37 countries, including the United States, Canada, China, and other major markets. Variable definitions and summary statistics are provided in Appendix Tables A.1 and A.2, while Table A.4 reports the annual distribution of the sample, which spans 28 to 33 countries in each year. We document a steady increase in foreign institutional ownership (FIO) over time, rising from 5.0% in 2007 to 8.8% in 2019, with approximately 4.0% attributed to US investors and 4.8% to non-US investors.

We also find strong evidence of persistence in FIO. As shown in Appendix Table A.5, regressions of current FIO on its lagged value and relevant control variables reveal highly persistent dynamics. The coefficient on lagged FIO ranges from 0.9174 when firm fixed effects are included to 0.9875 when country fixed effects are used. These results highlight the stability of foreign institutional holdings over time and underscore the relevance of accounting for persistence in FIO when evaluating its impact on firm outcomes.

3.2 Empirical Framework

We run panel fixed effects regressions of the form:

$$\mathrm{ret}_{\mathrm{i,t}} = \boldsymbol{\beta} \times \mathbf{GFC_t} \times \mathbf{FIO_{i,t}} + \delta \times X_{i,t} + \alpha_i + \mathrm{v_t} + \varepsilon_{i,t} \qquad (1)$$

where *ret* is the stock return of firm i in period t, *GFC* is the **change** in *VIX*, *EBP*, or *MGFC*. *FIO* is the foreign institutional ownership (*fio*) for firm *i* in period *t*. **X** is a set of firm-level control variables, and we allow for firm-level and period-level fixed effects.[6] Note that because of the period fixed effects, we do not include the GFC measure on its own in the specification. On the other hand, we include institutional ownership on its own as part of the control variables.

Our coefficient of interest is β, which is the interaction term between the global financial cycle and the foreign institutional ownership. The worsened global financial condition may induce the negative spillover effect on the global firms' stock returns. A negative (positive) β indicates that a higher FIO is associated with a larger spillover effect from the GFC for the cases of VIX and EBP (MGFC).

If the GFC indicates worse global financial conditions, then the **change** in VIX or EBP is positive, but the change in *MGFC* is negative. Therefore, the expected sign for β is **negative for the first two measures** but **positive for** *MGFC* in the case where FIO amplifies sensitivities to global financial conditions.

3. Results

4.1 Main Findings

We begin by estimating our baseline specification using the full sample. The regression results, presented in Table 1, reveal a statistically significant relationship between foreign institutional ownership (FIO) and firms' sensitivity to global financial conditions. Specifically, we find a negative (positive) and significant coefficient on the interaction terms between FIO and VIX and EBP (MGFC). A one standard deviation

[6] In Table 5, we also report the estimation using country fixed effects and country and date two-way clustered standard errors, and the findings still hold.

deterioration in global financial condition (reflected by increases in the VIX and EBP and a decrease in the MGFC) is associated with a 1.8% to 2.2% decline in stock returns for firms with full FIO compared to firms without FIO.[7] These findings suggest that firms with greater foreign institutional ownership exhibit heightened sensitivity to global financial shocks.

Table 1. Baseline: Foreign Institutional Ownership and GFC

*The table reports results from fixed effects panel regressions with stock returns as the dependent variable. Column 1 interacts FIO ownership with the changes in the VIX as a measure for the GFC. Column 2 uses changes in the EBP as the GFC measure, and column 3 uses the factor from Miranda-Agrippino and Rey (2020). Standard errors are clustered by firm, and *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.*

	(1)	(2)	(3)
Dependent Var.:	ret	ret	ret
fio × d_vix	-0.0047***		
	(-8.555)		
fio × d_ebp		-0.0658***	
		(-6.963)	
fio × d_mgfc			0.0832***
			(6.980)
fio	-0.0674***	-0.0664***	-0.0645***
	(-8.080)	(-7.973)	(-7.727)
log_asset	-0.0169***	-0.0166***	-0.0167***
	(-17.79)	(-18.03)	(-17.99)
lev	-2.32e-5	-1.93e-5	-1.14e-5
	(-1.521)	(-1.299)	(-0.6009)
sale_growth	1.32e-7***	1.15e-7***	1.1e-7***
	(6.511)	(5.927)	(5.365)
bm	0.0001***	0.0001***	0.0001***
	(3.474)	(2.829)	(3.159)
roa	5.6e-5	5.95e-5	6.47e-5
	(0.8848)	(0.9409)	(1.001)
cash	-0.0057	-0.0042	-0.0044
	(-1.498)	(-1.112)	(-1.173)
div	1.92e-6	3.76e-7	3.02e-7
	(0.2059)	(0.0410)	(0.0331)
Fixed-Effects:			
Firm	Yes	Yes	Yes
Date	Yes	Yes	Yes
SE Clustering	by: Firm	by: Firm	by: Firm
Observations	752,915	789,972	785,192
R2	0.09	0.09	0.09
Within R2	0.002	0.002	0.002

[7] For instance, if we assume there is a one-standard-deviation increase of *d_vix* (4.991 from Table A2), then the difference in returns between firms with full FIO and firms without FIO is 4.991×0.0038 = 0.0190 or 1.9%. Similarly, if we use other measures of GFC, we have very similar difference in returns from 1.8% to 2.2%.

One explanation may be that the results are being driven by FIO investment in US firms given that the VIX and EBP are risk measures for stock and bond markets in the US, respectively, and that there is evidence that indicates that fluctuations in the GFC mainly originate from developments in the US, such as US monetary policy (see e.g., Miranda-Agrippino and Rey, 2020). To investigate this hypothesis, we re-estimate our baseline specification, adding a third interaction term, which is a dummy variable equal to one if the firm is based in the US and zero otherwise. The results are reported in Table 2.

Table 2. Baseline: US and Non-US Firms

*The table reports results from fixed effects panel regressions with stock returns as the dependent variable. Column 1 interacts FIO ownership (and a dummy variable for US firms) with the changes in the VIX as the measure for the GFC. Column 2 uses changes in the EBP as the GFC measure, and column 3 uses the factor from Miranda-Agrippino and Rey (2020). Standard errors are clustered by firm, and *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.*

	(1)	(2)	(3)
Dependent Var.:	ret	ret	ret
fio × d_vix	-0.0038***		
	(-7.061)		
fio × d_vix × US Firm	-0.0159***		
	(-9.604)		
fio × d_ebp		-0.0633***	
		(-6.681)	
fio × d_ebp × US Firm		-0.0411	
		(-1.445)	
fio × d_mgfc			0.0753***
			(6.341)
fio × d_mgfc × US Firm			0.1298***
			(3.571)
fio	-0.0669***	-0.0664***	-0.0639***
	(-8.017)	(-7.969)	(-7.641)
log_asset	-0.0169***	-0.0166***	-0.0167***
	(-17.79)	(-18.03)	(-17.99)
lev	-2.32e-5	-1.93e-5	-1.13e-5
	(-1.517)	(-1.298)	(-0.5966)
sale_growth	1.37e-7***	1.17e-7***	1.15e-7***
	(6.679)	(5.998)	(5.545)
bm	0.0001***	0.0001***	0.0001***
	(3.475)	(2.829)	(3.162)
roa	5.61e-5	5.95e-5	6.47e-5
	(0.8880)	(0.9422)	(1.003)
cash	-0.0057	-0.0042	-0.0044
	(-1.497)	(-1.112)	(-1.174)
div	2.2e-6	4.42e-7	4.33e-7
	(0.2346)	(0.0481)	(0.0474)
Fixed-Effects:			
Firm	Yes	Yes	Yes
Date	Yes	Yes	Yes
SE Clustering	by: Firm	by: Firm	by: Firm
Observations	752,915	789,972	785,192
R2	0.09	0.09	0.09
Within R2	0.002	0.002	0.002

We find that the effect we document is present both for stock returns for US and non-US firms. Moreover, consistent with the notion that the VIX and other measures of the GFC have origins in the US, we find more pronounced effects on US firms. Interestingly, this is not the case with the EBP, which measures investor risk appetite in

bond markets. The results are pretty robust and significant, even when we re-estimate our specification across two subsamples of US-based and non-US-based firms, indicating that the effect is quite universal across firms globally.

Second, we also verify whether we obtain the same results for FIOs that are based in the US and those that are not. The results, reported in Table 3, indicate that the presence of non-US FIOs is also associated with amplified effects of the GFC on stock returns. If anything, we find more substantial effects for non-US FIOs. We also verify that this result is not driven by non-US FIOs investing in US firms by running the same regression for the sample of firms that exclude US firms (see Table 11).[8]

[8] Clearly, investment by US IOs in US firms would not be considered a foreign institutional investment.

Table 3. Baseline: US and Non-US Foreign Institutional Owners

*The table reports results from fixed effects panel regressions with stock returns as the dependent variable. Column 1 interacts FIO ownership for US (fio_us) and non-US (fio_nus) institutional investors with the changes in the VIX as the measure for the GFC. Column 2 uses changes in the EBP as the GFC measure, and column 3 uses the factor from Miranda-Agrippino and Rey (2020). Standard errors are clustered by firm, and *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.*

	(1)	(2)	(3)
Dependent Var.:	ret	ret	ret
fio_us × d_vix	-0.0015**		
	(-2.487)		
fio_nus × d_vix	-0.0172***		
	(-11.18)		
fio_us × d_ebp		-0.0475***	
		(-4.454)	
fio_nus × d_ebp		-0.1390***	
		(-5.595)	
fio_us × d_mgfc			0.0490***
			(3.752)
fio_nus × d_mgfc			0.2195***
			(6.849)
fio_us	-0.0779***	-0.0766***	-0.0762***
	(-6.615)	(-6.472)	(-6.432)
fio_nus	-0.0525***	-0.0525***	-0.0469***
	(-4.631)	(-4.671)	(-4.150)
log_asset	-0.0169***	-0.0166***	-0.0168***
	(-17.84)	(-18.08)	(-18.06)
lev	-2.33e-5	-1.94e-5	-1.15e-5
	(-1.529)	(-1.308)	(-0.6062)
sale_growth	1.34e-7***	1.17e-7***	1.13e-7***
	(6.470)	(5.909)	(5.383)
bm	0.0001***	0.0001***	0.0001***
	(3.475)	(2.837)	(3.169)
roa	5.63e-5	5.98e-5	6.5e-5
	(0.8893)	(0.9453)	(1.005)
cash	-0.0057	-0.0041	-0.0044
	(-1.493)	(-1.108)	(-1.167)
div	1.86e-6	1.78e-7	1.49e-7
	(0.1975)	(0.0192)	(0.0162)
Fixed-Effects:			
Firm	Yes	Yes	Yes
Date	Yes	Yes	Yes
SE Clustering	by: Firm	by: Firm	by: Firm
Observations	752,915	789,972	785,192
R2	0.09	0.09	0.09
Within R2	0.002	0.002	0.002

Third, we verify whether the amplifying effect of FIOs on stock return sensitivity to the GFC is more acute during periods of significant stress or crises. We run our baseline specification for sub-samples covering crisis and non-crisis periods. The crisis

period is defined as covering the years 2007-2009 for the Global Financial Crisis and the period 2009-2013 for the European Sovereign Debt Crisis. The results are reported in Table 4. We find that the effect we document is indeed more significant during crisis years. Nevertheless, we find that FIO still has an amplifying effect on global stock prices.

Table 4. Crisis vs Non-Crisis Years

*The table reports results from fixed effects panel regressions with stock returns as the dependent variable. Column 1 interacts with FIO ownership and the changes in the VIX as a measure for the GFC. Column 2 uses changes in the EBP as the GFC measure, and column 3 uses the factor from Miranda-Agrippino and Rey (2020). Columns 1 to 3 use the crisis years sub-sample. Columns 4-6 repeat the same exercise for the non-crisis years sub-sample. Standard errors are clustered by firm, and *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.*

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Var.:	ret	ret	ret	ret	ret	ret
		Crisis years:			Normal Time:	
fio × d_vix	-0.0070***			-0.0007		
	(-9.706)			(-1.042)		
fio × d_ebp		-0.0854***			0.0130	
		(-8.020)			(0.8167)	
fio × d_mgfc			0.0926***			0.0445**
			(7.193)			(2.425)
fio	-0.1039***	-0.1000***	-0.0986***	-0.0738***	-0.0741***	-0.0750***
	(-8.938)	(-8.389)	(-8.344)	(-4.292)	(-4.435)	(-4.391)
log_asset	-0.0252***	-0.0243***	-0.0244***	-0.0226***	-0.0223***	-0.0223***
	(-15.70)	(-15.71)	(-15.75)	(-10.64)	(-10.64)	(-10.40)
lev	-2.73e-5	-2.35e-5	-2.35e-5	2.31e-5	2.63e-5	9.3e-5
	(-1.405)	(-1.222)	(-1.220)	(0.4223)	(0.5261)	(1.332)
sale_growth	4.67e-9	-2.28e-8	-6.95e-9	5.36e-6	6.75e-6	6.42e-6
	(0.1453)	(-0.7456)	(-0.2269)	(1.390)	(1.461)	(1.380)
bm	0.0002***	0.0002***	0.0002***	7.36e-5	2.39e-5	5.59e-5
	(4.138)	(4.171)	(4.160)	(0.5003)	(0.1830)	(0.4590)
roa	6.14e-5	6.12e-5	6.11e-5	0.0006	0.0006	0.0007
	(1.013)	(1.049)	(1.046)	(1.326)	(1.328)	(1.518)
cash	-0.0042	-0.0007	-0.0008	-0.0204***	-0.0216***	-0.0231***
	(-0.7546)	(-0.1406)	(-0.1514)	(-2.630)	(-2.814)	(-2.983)
div	3.27e-5*	2.89e-5*	2.91e-5*	-8.57e-6	-1.01e-5	-1.1e-5
	(1.766)	(1.746)	(1.752)	(-0.3877)	(-0.4827)	(-0.5320)
Fixed-Effects:						
Firm	Yes	Yes	Yes	Yes	Yes	Yes
Date	Yes	Yes	Yes	Yes	Yes	Yes
SE Clustering	by: Firm	by: Firm	by: Firm	by: Firm	by: Firm	by: Firm
Observations	431,643	458,943	458,943	321,272	331,029	326,249
R2	0.11	0.10	0.10	0.07	0.07	0.07
Within R2	0.002	0.002	0.002	0.001	0.001	0.001

4.2 Robustness Exercises

We then run a battery of robustness exercises to strengthen our findings. First, we obtain the same results under alternative specifications for fixed effects and standard errors. We also check whether differences in country legal systems can induce heterogeneity in the effects we observe. To do so, we construct dummy variables distinguishing between FIOs from common-law and civil-law countries and interact them with measures of the GFC. We find that our main results hold when we distinguish between FIOs from common-law and civil-law countries. Here, we find a larger magnitude of the effect for FIOs from civil law countries (e.g., primarily European and Asian countries). We also obtain the same findings in a sample that excludes penny stocks, as well as when we include additional control variables. These results are reported in Tables 5-11.

First, we assess the robustness of our main results by varying the fixed effects and the level at which standard errors are clustered. Given that our sample comprises firms from multiple countries with potentially heterogeneous characteristics, such as legal origin, stage of economic development, and institutional frameworks, it is essential to account for cross-country differences that may influence firm performance and stock market behavior. Accordingly, we re-estimate our baseline regressions with country fixed effects, as well as with two-way clustering of standard errors at the country and date levels. As reported in Table 5, our main results remain statistically and economically robust under these alternative model specifications. Importantly, the estimated coefficients are similar in magnitude to those in Table 2, where firm fixed effects are employed, suggesting that our findings are not driven by unobserved country-level heterogeneity.

Table 5. Robustness: Alternative Fixed Effects and Standard Errors

*The table reports results from fixed effects panel regressions with stock returns as the dependent variable. Column 1 interacts FIO ownership with the changes in the VIX as the measure for the GFC. Column 2 uses changes in the EBP as the GFC measure, and column 3 uses the factor from Miranda-Agrippino and Rey (2020). Columns 1 to 3 replace the firm and time fixed effects with country and time. Standard errors are clustered by firm. Columns 4 to 6 use the baseline specification with standard errors clustered at the country and time levels. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.*

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Var.:	ret	ret	ret	ret	ret	ret
fio × d_vix	-0.0047***			-0.0047**		
	(-8.416)			(-2.467)		
fio × d_ebp		-0.0624***			-0.0624**	
		(-6.525)			(-2.505)	
fio × d_mgfc			0.0791***			0.0791***
			(6.565)			(2.791)
fio	-0.0088***	-0.0077***	-0.0060**	-0.0088**	-0.0077*	-0.0060
	(-3.072)	(-2.741)	(-2.158)	(-2.059)	(-2.006)	(-1.597)
log_asset	0.0024***	0.0023***	0.0024***	0.0024***	0.0023***	0.0024***
	(15.38)	(15.29)	(15.53)	(6.637)	(7.205)	(7.242)
lev	1.06e-5	1.37e-5	2.07e-5	1.06e-5	1.37e-5	2.07e-5**
	(0.5598)	(0.6999)	(0.8644)	(0.9258)	(1.210)	(2.348)
sale_growth	1.91e-7***	1.76e-7***	1.78e-7***	1.91e-7	1.76e-7	1.78e-7***
	(6.972)	(6.374)	(5.942)	(0.0191)	(0.0176)	(2.992)
bm	2.7e-5	5.22e-6	9.68e-6	2.7e-5	5.22e-6	9.68e-6
	(0.6259)	(0.1054)	(0.2106)	(1.320)	(0.2580)	(0.5166)
roa	5.69e-5**	5.73e-5**	6.12e-5**	5.69e-5***	5.73e-5***	6.12e-5***
	(2.265)	(2.448)	(2.430)	(3.849)	(4.128)	(4.246)
cash	0.0146***	0.0142***	0.0144***	0.0146***	0.0142***	0.0144***
	(9.545)	(9.579)	(9.643)	(7.434)	(7.614)	(7.618)
div	7.24e-6	7.82e-6	8.29e-6	7.24e-6	7.82e-6	8.29e-6
	(0.6231)	(0.6750)	(0.7098)	(0.4427)	(0.4722)	(0.5884)
Fixed-Effects:						
Country	Yes	Yes	Yes	Yes	Yes	Yes
Date	Yes	Yes	Yes	Yes	Yes	Yes
SE Clustering	by: Firm	by: Firm	by: Firm	by: Country & Date	by: Country & Date	by: Country & Date
Observations	752,915	789,972	785,192	752,915	789,972	785,192
R2	0.06	0.06	0.06	0.06	0.06	0.06
Within R2	0.0008	0.0007	0.0008	0.0008	0.0007	0.0008

Second, we compare the effect among FIO from common-law versus civil-law countries. Legal rules are used to protect corporate shareholders and creditors, which may drive the decisions of foreign institutional investors when they invest abroad. For example, common-law countries often have the strongest legal protection, whereas civil-law countries typically have the weakest (La Porta et al., 1998). Table 6 shows

that our findings are robust for FIO from both common-law and civil-law countries. Interestingly, the coefficients seem to be stronger for civil-law countries' FIO.

Table 6. Robustness: Institutional Investors from Common Law vs Civil Law Countries

*The table reports results from fixed effects panel regressions with stock returns as the dependent variable. Column 1 interacts FIO ownership for institutional investors from Common Law and Civil Law countries with the changes in the VIX as the measure for the GFC. Column 2 uses changes in the EBP as the GFC measure, and column 3 uses the factor from Miranda-Agrippino and Rey (2020). Standard errors are clustered by firm, and *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.*

	(1)	(2)	(3)
Dependent Var.:	ret	ret	ret
d_vix × fio_common	-0.0027***		
	(-4.689)		
d_vix × fio_civil	-0.0278***		
	(-7.668)		
d_ebp × fio_common		-0.0601***	
		(-5.736)	
d_ebp × fio_civil		-0.1336**	
		(-2.401)	
d_mgfc × fio_common			0.0658***
			(5.120)
d_mgfc × fio_civil			0.2881***
			(4.407)
fio	-0.0674***	-0.0664***	-0.0645***
	(-8.105)	(-7.967)	(-7.734)
log_asset	-0.0169***	-0.0166***	-0.0167***
	(-17.79)	(-18.03)	(-17.98)
lev	-2.32e-5	-1.93e-5	-1.13e-5
	(-1.518)	(-1.298)	(-0.5979)
sale_growth	1.33e-7***	1.16e-7***	1.1e-7***
	(6.508)	(5.939)	(5.351)
bm	0.0001***	0.0001***	0.0001***
	(3.475)	(2.829)	(3.162)
roa	5.6e-5	5.95e-5	6.47e-5
	(0.8867)	(0.9418)	(1.002)
cash	-0.0057	-0.0041	-0.0044
	(-1.494)	(-1.111)	(-1.169)
div	1.98e-6	4.12e-7	3.57e-7
	(0.2113)	(0.0448)	(0.0390)
Fixed-Effects:			
Firm	Yes	Yes	Yes
Date	Yes	Yes	Yes
SE Clustering	by: Firm	by: Firm	by: Firm
Observations	752,915	789,972	785,192
R2	0.09	0.09	0.09
Within R2	0.002	0.002	0.002

Third, we address potential concerns about outliers and return volatility by excluding penny stocks, defined as stocks with prices below $5 – a common practice in empirical asset pricing studies (e.g., Hong and Sraer, 2016). Penny stocks often exhibit extreme return volatility and illiquidity, which may disproportionately influence regression estimates. We re-estimate our baseline specifications using the filtered sample, and the results, reported in Table 7, remain qualitatively unchanged. This robustness check further supports the validity of our findings.

Table 7. Robustness: Drop Penny Stocks (stock price less than $5)

*The table reports results from fixed effects panel regressions with stock returns as the dependent variable for the sample without penny stocks. Column 1 interacts FIO ownership with the changes in the VIX as the measure for the GFC. Column 2 uses changes in the EBP as the GFC measure, and column 3 uses the factor from Miranda-Agrippino and Rey (2020). Standard errors are clustered by firm, and *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.*

	(1)	(2)	(3)
Dependent Var.:	ret	ret	ret
fio × d_vix	-0.0034***		
	(-6.603)		
fio × d_ebp		-0.0636***	
		(-7.093)	
fio × d_mgfc			0.0773***
			(6.622)
fio	-0.0773***	-0.0764***	-0.0759***
	(-8.922)	(-9.083)	(-9.043)
log_asset	-0.0219***	-0.0220***	-0.0221***
	(-22.13)	(-23.02)	(-23.11)
lev	0.0055	0.0067	0.0064
	(1.210)	(1.575)	(1.505)
sale_growth	-3e-5	-2.88e-5	-3.08e-5
	(-0.9427)	(-0.9268)	(-0.9674)
bm	0.0005	0.0005	0.0005
	(1.203)	(1.221)	(1.206)
roa	-0.0081*	-0.0074*	-0.0075*
	(-1.894)	(-1.762)	(-1.808)
cash	-0.0398***	-0.0394***	-0.0396***
	(-10.23)	(-10.50)	(-10.52)
div	-4.23e-6	-5.77e-6	-5.7e-6
	(-0.4442)	(-0.6127)	(-0.6041)
Fixed-Effects:			
Firm	Yes	Yes	Yes
Date	Yes	Yes	Yes
SE Clustering	by: Firm	by: Firm	by: Firm
Observations	504,494	529,795	526,412
R2	0.18	0.18	0.18
Within R2	0.005	0.005	0.005

Fourth, we incorporate additional controls for country-level macroeconomic conditions, including exchange rates and GDP growth. Under the interest rate parity framework, the domestic interest rate reflects both the foreign interest rate and the expected depreciation of the local currency.[9] Consequently, short-term exchange rate fluctuations may influence domestic interest rates and, by extension, stock returns. To account for this channel, we control for exchange rate movements in the focal country. Additionally, we include GDP growth as a proxy for domestic economic cycles to mitigate potential confounding effects arising from country-specific business conditions. As shown in Tables 8, 9, and 10, our main findings remain robust when these macroeconomic variables are included. These results help alleviate concerns about omitted variable bias related to macroeconomic fundamentals and provide further support for the validity of our identification strategy.

[9] Moreover, the interest rate differentials also drive the global cash flows and credit spreads (Miranda-Agrippino, 2021).

Table 8. Robustness: Additional Controls for Country Characteristics

*The table reports results from fixed effects panel regressions with stock returns as the dependent variable. The regression specifications include changes in the exchange rate and real GDP growth rate as additional control variables. Column 1 interacts FIO ownership with the changes in the VIX as the measure for the GFC. Column 2 uses changes in the EBP as the GFC measure, and column 3 uses the factor from Miranda-Agrippino and Rey (2020). Standard errors are clustered by firm, and *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.*

	(1)	(2)	(3)
Dependent Var.:	ret	ret	ret
fio × d_vix	-0.0053***		
	(-8.009)		
fio × d_ebp		-0.0720***	
		(-6.731)	
fio × d_mgfc			0.0940***
			(6.798)
fio	-0.0698***	-0.0688***	-0.0665***
	(-7.885)	(-7.780)	(-7.495)
log_asset	-0.0167***	-0.0164***	-0.0165***
	(-17.50)	(-17.76)	(-17.73)
lev	-2.17e-5	-1.79e-5	-9.99e-6
	(-1.402)	(-1.185)	(-0.5210)
sale_growth	8.13e-8***	5.96e-8***	5.61e-8**
	(3.699)	(2.826)	(2.534)
bm	0.0001***	0.0001***	0.0001***
	(3.469)	(2.811)	(3.147)
roa	5.68e-5	6.02e-5	6.54e-5
	(0.8965)	(0.9525)	(1.012)
cash	-0.0058	-0.0043	-0.0045
	(-1.502)	(-1.132)	(-1.188)
div	8.13e-6	6.24e-6	6.15e-6
	(1.270)	(0.9520)	(0.9345)
d_exrate	0.1016***	0.1073***	0.1053***
	(8.065)	(8.685)	(8.487)
gdpgr	0.0019***	0.0018***	0.0018***
	(3.190)	(2.976)	(3.014)
Fixed-Effects:			
Firm	Yes	Yes	Yes
Date	Yes	Yes	Yes
SE Clustering	by: Firm	by: Firm	by: Firm
Observations	744,954	781,629	776,916
R2	0.09	0.09	0.09
Within R2	0.002	0.002	0.002

Table 9. Robustness: US vs non-US based Firms with Additional Controls

*The table reports results from fixed effects panel regressions with stock returns as the dependent variable. The regression specifications include changes in the exchange rate and real GDP growth rate as additional control variables. Column 1 interacts FIO ownership (and a dummy variable for US firms) with the changes in the VIX as the measure for the GFC. Column 2 uses changes in the EBP as the GFC measure, and column 3 uses the factor from Miranda-Agrippino and Rey (2020). Standard errors are clustered by firm, and *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.*

	(1)	(2)	(3)
Dependent Var.:	ret	ret	ret
fio × d_vix	-0.0039***		
	(-6.050)		
fio × d_vix x US Firm	-0.0162***		
	(-9.593)		
fio × d_ebp		-0.0672***	
		(-6.247)	
fio × d_ebp x US Firm		-0.0542*	
		(-1.888)	
fio × d_mgfc			0.0819***
			(5.886)
fio × d_mgfc x US Firm			0.1387***
			(3.741)
fio	-0.0692***	-0.0688***	-0.0657***
	(-7.814)	(-7.773)	(-7.403)
log_asset	-0.0167***	-0.0164***	-0.0165***
	(-17.50)	(-17.76)	(-17.72)
lev	-2.16e-5	-1.78e-5	-9.84e-6
	(-1.393)	(-1.182)	(-0.5130)
sale_growth	8.35e-8***	6.19e-8***	5.94e-8***
	(3.784)	(2.916)	(2.664)
bm	0.0001***	0.0001***	0.0001***
	(3.470)	(2.812)	(3.149)
roa	5.69e-5	6.03e-5	6.55e-5
	(0.9004)	(0.9545)	(1.015)
cash	-0.0058	-0.0043	-0.0045
	(-1.505)	(-1.134)	(-1.196)
div	8.33e-6	6.28e-6	6.21e-6
	(1.289)	(0.9596)	(0.9388)
d_exrate	0.1067***	0.1095***	0.1106***
	(8.483)	(8.926)	(8.960)
gdpgr	0.0019***	0.0018***	0.0018***
	(3.120)	(2.942)	(2.996)
Fixed-Effects:			
Firm	Yes	Yes	Yes
Date	Yes	Yes	Yes
SE Clustering	by: Firm	by: Firm	by: Firm
Observations	744,954	781,629	776,916
R2	0.09	0.09	0.09
Within R2	0.002	0.002	0.002

Table 10. Robustness: US vs non-US based FIOs with Additional Controls

*The table reports results from fixed effects panel regressions with stock returns as the dependent variable. The regression specifications include changes in the exchange rate and real GDP growth rate as additional control variables. Column 1 interacts FIO ownership for US (fio_us) and non-US (fio_nus) institutional investors with the changes in the VIX as the measure for the GFC. Column 2 uses changes in the EBP as the GFC measure, and column 3 uses the factor from Miranda-Agrippino and Rey (2020). Standard errors are clustered by firm, and *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.*

	(1)	(2)	(3)
Dependent Var.:	ret	ret	ret
fio_us × d_vix	-0.0013*		
	(-1.755)		
fio_nus × d_vix	-0.0179***		
	(-11.63)		
fio_us × d_ebp		-0.0479***	
		(-3.928)	
fio_nus × d_ebp		-0.1515***	
		(-5.768)	
fio_us × d_mgfc			0.0522***
			(3.382)
fio_nus × d_mgfc			0.2324***
			(6.938)
fio_us	-0.0826***	-0.0819***	-0.0816***
	(-6.337)	(-6.245)	(-6.219)
fio_nus	-0.0530***	-0.0525***	-0.0458***
	(-4.619)	(-4.618)	(-4.005)
log_asset	-0.0168***	-0.0165***	-0.0167***
	(-17.58)	(-17.83)	(-17.82)
lev	-2.18e-5	-1.79e-5	-1e-5
	(-1.407)	(-1.193)	(-0.5239)
sale_growth	8.04e-8***	6.05e-8***	5.6e-8**
	(3.568)	(2.786)	(2.465)
bm	0.0001***	0.0001***	0.0001***
	(3.470)	(2.821)	(3.158)
roa	5.71e-5	6.06e-5	6.58e-5
	(0.9017)	(0.9578)	(1.017)
cash	-0.0058	-0.0043	-0.0045
	(-1.502)	(-1.132)	(-1.190)
div	8.04e-6	6e-6	5.95e-6
	(1.227)	(0.8991)	(0.8811)
d_exrate	0.1054***	0.1104***	0.1104***
	(8.386)	(8.993)	(8.939)
gdpgr	0.0019***	0.0018***	0.0018***
	(3.173)	(2.969)	(3.051)
Fixed-Effects:			
Firm	Yes	Yes	Yes
Date	Yes	Yes	Yes
SE Clustering	by: Firm	by: Firm	by: Firm
Observations	744,954	781,629	776,916
R2	0.09	0.09	0.09
Within R2	0.002	0.002	0.002

Fifth, we assess the robustness of our findings by excluding US firms from the sample and re-estimating our regressions. As reported in Table 11, we find that FIO by non-US investors remains significantly associated with heightened sensitivity to the GFC, thereby reinforcing our main results. In contrast, for the US-based FIO, the relationship remains statistically significant only when using the VIX as a proxy for global financial conditions; however, it becomes insignificant for alternative measures, such as EBP and MGFC. These findings suggest that non-US foreign investors may play a more prominent role in transmitting global financial volatility to local equity markets.[10]

[10] Table A.7 in the Appendix reports the consistency of the findings for FIO from common-law and civil-law countries after we excluded the US firms.

Table 11. Robustness: US vs. non-US based FIOS excluding US Firms

*The table reports results from fixed effects panel regressions with stock returns as the dependent variable in a sample which excludes US firms. Column 1 interacts FIO ownership for US (fio_us) and non-US (fio_nus) institutional investors with the changes in the VIX as the measure for the GFC. Column 2 uses changes in the EBP as the GFC measure, and column 3 uses the factor from Miranda-Agrippino and Rey (2020). Standard errors are clustered by firm, and *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.*

	(1)	(2)	(3)
Dependent Var.:	ret	ret	ret
fio_us × d_vix	-0.0021***		
	(-2.855)		
fio_nus × d_vix	-0.0096***		
	(-3.310)		
fio_us × d_ebp		0.0129	
		(1.014)	
fio_nus × d_ebp		-0.1542***	
		(-3.387)	
fio_us × d_mgfc			0.0180
			(1.175)
fio_nus × d_mgfc			0.2003***
			(3.407)
fio_us	-0.0654***	-0.0663***	-0.0653***
	(-5.400)	(-5.425)	(-5.325)
fio_nus	-0.0649**	-0.0659**	-0.0637**
	(-2.334)	(-2.383)	(-2.343)
log_asset	-0.0192***	-0.0188***	-0.0190***
	(-9.671)	(-9.836)	(-9.746)
lev	-5.74e-5*	-4.56e-5**	1.31e-5
	(-1.786)	(-2.024)	(0.2546)
sale_growth	1.33e-9	-8.91e-10	-1.71e-8
	(0.0544)	(-0.0364)	(-0.6967)
bm	0.0059***	0.0060***	0.0060***
	(3.670)	(3.698)	(3.690)
roa	0.0006***	0.0006***	0.0006**
	(3.182)	(2.709)	(2.189)
cash	-0.0109	-0.0088	-0.0097
	(-1.274)	(-1.060)	(-1.137)
div	-0.0001	-0.0001	-0.0001
	(-0.7417)	(-0.8624)	(-0.8950)
Fixed-Effects:			
Firm	Yes	Yes	Yes
Date	Yes	Yes	Yes
SE Clustering	by: Firm	by: Firm	by: Firm
Observations	191,110	200,397	198,983
R2	0.08	0.08	0.08
Within R2	0.003	0.003	0.003

4.3 Channels

We then investigate whether the effects we document are driven by FIOs selecting firms that are *ex-ante* (relative to FIO investment) more homogenous to each other and therefore more sensitive to the GFC, or whether the increased sensitivity to the GFC following FIO investment is a consequence of the FIO investment itself, i.e., that the increased sensitivity to the GFC is *ex-post* FIO investment.

To test the first hypothesis, we first compare groups of firms with and without FIO investment to assess their homogeneity.[11] We achieve this by collecting key firm characteristics that may be related to style investing, following the work of Barberis and Shleifer (2003) and Barberis et al. (2005). Specifically, we take size, market beta, book-to-market ratio, and momentum, and then evaluate group means and coefficients of variation. The results are reported in Table 12.

[11] Table A.6 also compares firms with FIO in less than or equal to three years versus firms with FIO more than three years.

Table 12. Within Group Similarities for FIO and non-FIO Firms

This table reports the summary statistics of firm characteristics of firms without FIO (Group A), with FIO (Group B), and with FIO equal to or above 7% (Group C). We also test for differences in the mean using Hotelling's T-squared and Multivariate Analysis of Variance (MANOVA) tests across the three groups. The firm characteristics include firm size (size), beta based on 60-month rolling estimation (beta), book-to-market ratio (bm), and momentum from month t-12 to month t-2 (momentum).

Group A: No FIO				
Variable	**Obs**	**Mean**	**SD**	**Coefficient of Variation (CV)**
size	33,400	3.40	1.11	**0.33**
beta_60m	33,400	0.92	0.71	**0.77**
bm	33,400	2.80	5.45	**1.95**
momentum	33,400	0.12	0.77	**6.30**
Group B: With FIO				
Variable	**Obs**	**Mean**	**SD**	**Coefficient of Variation (CV)**
size	489,694	6.67	2.04	**0.31**
beta_60m	489,694	1.23	0.68	**0.56**
bm	489,694	1.42	1.88	**1.33**
momentum	489,694	0.10	0.65	**6.25**
Group C: Top FIO (FIO >= 7%)				
Variable	**Obs**	**Mean**	**SD**	**Coefficient of Variation (CV)**
size	158,421	8.08	1.95	**0.24**
beta_60m	158,421	1.21	0.62	**0.51**
bm	158,421	1.17	2.11	**1.81**
momentum	158,421	0.10	0.50	**4.81**

Difference between:	**Hotelling T-squared (p-value)**	**MANOVA (p-value)**
Group A vs Group B	0.00	0.00
Group A vs Group C	0.00	0.00

We find that firms with FIO exhibit higher average market betas, indicating greater sensitivity to aggregate market returns. This result aligns with our earlier findings. FIOs tend to select high-beta stocks, which are inherently more responsive to market fluctuations. Furthermore, we observe that the coefficients of variation for firms with FIO are systematically lower than those for firms without FIO, suggesting that the portfolio of firms held by foreign institutional investors is more homogeneous in terms of risk characteristics. These patterns are consistent with a preference for within-portfolio conformity among FIOs, reinforcing the notion that their investment choices

are not random but instead concentrated in firms with similar exposure to systematic risk.

We then proceed with jointly testing both hypotheses by running a regression that compares the sensitivity of stock returns to the GFC for firms that never obtain FIO against those that do. We construct a dummy variable, *Never FIO*, which equals one for firms that never obtain FIO investment throughout our sample period and equals zero otherwise. We interact this dummy variable with measures of the GFC while also retaining the interaction between FIO investment and the GFC. Note that this means the omitted baseline interaction with the GFC (given the time fixed effects in our specification) refers to firms that currently have zero FIO investment but will have it at some point within our sample period. We also construct an alternative measure for FIO investment (*fioc*), which replaces values less than 0.01 with zero. This alternative variable essentially requires FIO investment to be relatively substantial to be considered significant. The use of this variable allows us to check whether our results hold for the case when the distinction between firms that have and do not have FIO investment is made when the FIO investment is sizable. The results are reported in Table 13.

Table 13. Channels: Never vs FIO firms

*The table reports results from fixed effects panel regressions with stock returns as the dependent variable in a sample that excludes US firms. Never FIO is a dummy variable equal to one if a firm never obtains FIO investment. The variable fioc is FIO investment wherein values less than 0.01 are treated as zero. The first two columns use the VIX as the GFC measure, the next two columns use EBP, and the last two columns use the factor from Miranda-Agrippino and Rey (2020). For each model, we measure FIO by fio (i.e., the first time firms obtain foreign institutional investment) in the odd columns and by fioc (i.e., the first time that foreign institutional investment exceeds 0.01) in the even columns. The omitted category consists of firms that at some point in time obtain FIO investment (Never FIO=0) but currently have no FIO investment (fio=0 or fioc=0). Standard errors are clustered by firm, and *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.*

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Var.:	ret	ret	ret	ret	ret	ret
Never FIO × d_vix	0.003***	0.003***				
	(0.000)	(0.000)				
fio/fioc × d_vix	-0.004***	-0.004***				
	(0.001)	(0.001)				
Never FIO × d_ebp			0.025***	0.025***		
			(0.007)	(0.007)		
fio/fioc × d_ebp			-0.059***	-0.059***		
			(0.009)	(0.009)		
Never FIO × d_mgfc					-0.051***	-0.051***
					(0.006)	(0.006)
fio/fioc × d_mgfc					0.070***	0.070***
					(0.012)	(0.012)
fio/fioc	-0.067***	-0.067***	-0.066***	-0.066***	-0.065***	-0.064***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
log_asset	-0.017***	-0.017***	-0.017***	-0.017***	-0.017***	-0.017***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
lev	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
sale_growth	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
bm	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
roa	0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
cash	-0.006	-0.006	-0.004	-0.004	-0.005	-0.005
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
div	0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Fixed Effects						
Firm	Yes	Yes	Yes	Yes	Yes	Yes
Date	Yes	Yes	Yes	Yes	Yes	Yes
SE Clustering	by: Firm	by: Firm	by: Firm	by: Firm	by: Firm	by: Firm
Observations	752,902	752,902	789,957	789,957	785,170	785,170
R2	0.087	0.087	0.086	0.086	0.086	0.086
Within R2	0.002	0.002	0.002	0.002	0.002	0.002

We find that firms that never obtain FIO investment are less sensitive to the GFC relative to firms that (eventually) obtain them. Moreover, we still find that FIO investment amplifies stock return sensitivities to the GFC, even after accounting for the differential sensitivity to the GFC among firms that never receive FIO investment. That is, we find evidence in support of the first hypothesis – that stock returns for firms that eventually obtain FIO investment are more sensitive to the GFC even before the FIO investment. In addition, our results indicate that there are both extensive and intensive margins to the effect of FIO investment on stock return sensitivity to the GFC.

We proceed with a formal test of both the first and second hypotheses by running event study regressions using the Extended Two-Way Fixed Effects (ETWFE) methodology proposed by Wooldridge (2023, 2025), which allows us to examine the effect of FIO investment (the "treatment") on stock return sensitivities to the GFC. Specifically, we construct a treatment variable ($Post \times FIO$) that captures the first time a firm obtains FIO investment in our sample. For robustness, we also construct an alternative treatment variable defined as the first time a firm's FIO investment exceeds 0.01. The control group (or baseline) used in the estimation is firms that never obtain FIO investment. The results are reported in Table 14. We find an increase in sensitivity to the GFC for stock returns of firms after the first time they obtain FIO investment (or FIO investment exceeds 0.01). This result is consistent with the second hypothesis, that FIO investment itself leads to stock returns of firms being more sensitive to the GFC.

Table 14. Channels: Event study

*The table reports results from Extended Two-Way Fixed Effects (ETWFE) event study regressions (Wooldridge, 2023, 2025). The dependent variable is stock returns. The treatment variable (Post × FIO) is the first time that a firm obtains foreign institutional investment in the odd columns and the first time that foreign institutional investment exceeds 0.01 in the even columns. The control group is firms that never obtain FIO investment. The first two columns use the VIX as the measure for the GFC, the third and fourth columns use the EBP, and the fifth and sixth columns use the factor from Miranda-Agrippino and Rey (2020). Standard errors are clustered by firm, and *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.*

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Var.:	ret	ret	ret	ret	ret	ret
Pre × FIO × d_vix	-0.001	-0.002***				
	(0.001)	(0.000)				
Post × FIO × d_vix	-0.002***	-0.004***				
	(0.000)	(0.000)				
Pre × FIO × d_ebp			0.010	-0.002		
			(0.010)	(0.007)		
Post × FIO × d_ebp			-0.017**	-0.027***		
			(0.008)	(0.007)		
Pre × FIO × d_mgfc					-0.002	0.021***
					(0.011)	(0.007)
Post × FIO × d_mgfc					0.033***	0.061***
					(0.008)	(0.007)
Pre × FIO	0.008	-0.002	0.007	-0.004	0.008	-0.004
	(0.014)	(0.004)	(0.014)	(0.004)	(0.014)	(0.004)
Post × FIO	-0.007	-0.008*	-0.007	-0.009**	-0.007	-0.008**
	(0.014)	(0.004)	(0.014)	(0.004)	(0.014)	(0.004)
log_asset	-0.020***	-0.019***	-0.019***	-0.019***	-0.020***	-0.019***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
lev	-0.000	-0.000	-0.000	0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
sale_growth	-0.000***	-0.000	-0.000*	-0.000	-0.000*	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
bm	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
roa	0.000	0.000***	0.000	0.000***	0.000	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
cash	0.004	-0.009	0.007	-0.005	0.006	-0.006
	(0.009)	(0.006)	(0.009)	(0.006)	(0.009)	(0.006)
div	0.000	0.000	0.000	0.000	0.000*	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Fixed Effects						
Firm	Yes	Yes	Yes	Yes	Yes	Yes
Date	Yes	Yes	Yes	Yes	Yes	Yes
SE Clustering	by: Firm	by: Firm	by: Firm	by: Firm	by: Firm	by: Firm
Observations	126,974	263,594	133,072	276,412	132,272	274,787
R2	0.053	0.071	0.052	0.069	0.053	0.070
Within R2	0.002	0.002	0.001	0.002	0.002	0.002

We extend our analysis of the second hypothesis, which examines whether firms with FIO become more sensitive to the GFC ex-post FIO investment, by checking whether stock returns of firms that have had FIO investment for longer periods are more sensitive to the GFC. Specifically, we construct a dummy variable (*New FIO*), which equals one for firms with FIO investment only for the last three years and equals zero for firms with FIO investment for more than three years. We then run our baseline specification with a triple-interaction term. The results are reported in Table 15. We find a significant difference between the two groups of new and old FIO firms, but in the opposite direction predicted by the FIO influence mechanism. That is, we find that stock returns of firms with FIO investment for less than three years are more sensitive to the GFC relative to firms that have had FIO investment for longer. In light of these findings, we interpret our previous results on the the effects of FIO investment on sensitivity to the GFC ex-post as being largely driven by liquidity and portfolio commonality mechanisms.

Table 15. Channels: New vs Old FIO Firms

*The table reports results from fixed effects panel regressions with stock returns as the dependent variable. Column 1 interacts FIO ownership with the changes in the VIX as the measure for the GFC along with a triple interaction for New FIO firms (less than 3 years of FIO investment). Column 2 uses changes in the EBP as the GFC measure, and column 3 uses the factor from Miranda-Agrippino and Rey (2020). Standard errors are clustered by firm, and *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.*

	(1)	(2)	(3)
Dependent Var.:	ret	ret	ret
fio × d_vix	-0.0019***		
	(-3.073)		
fio × d_vix × New FIO	-0.0058***		
	(-6.345)		
fio × d_ebp		-0.0121	
		(-1.119)	
fio × d_ebp × New FIO		-0.0833***	
		(-5.867)	
fio × d_mgfc			0.0444***
			(3.271)
fio × d_mgfc × New FIO			0.0625***
			(4.360)
fio	-0.0671***	-0.0661***	-0.0644***
	(-8.037)	(-7.940)	(-7.716)
log_asset	-0.0169***	-0.0166***	-0.0167***
	(-17.81)	(-18.05)	(-18.01)
lev	-0.0001	-0.0001	-0.0001
	(-1.524)	(-1.302)	(-0.6039)
sale_growth	0.0001***	0.0001***	0.0001***
	(6.334)	(5.363)	(5.145)
bm	0.0001***	0.0001***	0.0001***
	(3.474)	(2.830)	(3.160)
roa	0.0001	0.0001	0.0001
	(0.8868)	(0.9439)	(1.002)
cash	-0.0057	-0.0041	-0.0044
	(-1.493)	(-1.107)	(-1.168)
div	0.0001	0.0001	0.0001
	(0.2087)	(0.0528)	(0.0284)
Fixed-Effects:			
Firm	Yes	Yes	Yes
Date	Yes	Yes	Yes
SE Clustering	by: Firm	by: Firm	by: Firm
Observations	752,915	789,972	785,192
R2	0.09	0.09	0.09
Within R2	0.002	0.002	0.002

4. Concluding Remarks

This study examines the relationship between foreign institutional ownership (FIO) and firm-level exposure to the Global Financial Cycle (GFC), using three established proxies: the *VIX*, Excess Bond Premium (*EBP*), and the common factor GFC (*MGFC*). Leveraging granular monthly data on 9,642 firms across 37 countries from 2007 to 2019, we show that firms with higher FIO exhibit significantly greater sensitivity to global financial shocks.

We explore two potential mechanisms: (i) FIOs select ex-ante similar firms, and (ii) FIO investment itself makes stock returns more sensitive to the GFC ex-post and that FIOs potentially shape firm behavior to also increase sensitivity to the GFC over time. The evidence we document supports the first channel. Firms with FIO tend to be more homogeneous (exhibiting higher betas and lower variation in risk characteristics) and are more sensitive to global financial conditions even before receiving FIO investment. Our event-based ETWFE regressions also indicate a modest post-investment increase in GFC sensitivity following first-time FIO entry in support of mechanisms such as liquidity and portfolio commonalities among FIOs. However, this effect is strongest in the short term and fades over time offering limited support for the FIO influence mechanism.

Overall, our findings suggest that the stronger global co-movement observed among firms with FIO is primarily driven by selection effects, both ex-ante and ex-post, and not investor-induced changes in firm behavior over time. These results have important implications for global diversification: foreign institutional investors appear to leave diversification gains untapped by systematically favoring similarly exposed firms.

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Appendix

Table A.1 Variable Definitions

Variable	Definition	Source
A. Main variables		
ret	Monthly stock returns	Compustat
vix	VIX index	CBOE
ebp	The excess bond premium proposed by Gilchrist and Zakrajsek (2012) and extended in Gilchrist et al. (2022)	FED
mgfc	Monetary-based global financial cycles introduced by Miranda-Agrippino and Rey (2020).	Silvia Miranda-Agrippino website
d_vix	Change in VIX index	CBOE
d_ebp	Change in the excess bond premium	FED
d_mgfc	Change in Monetary-based global financial cycles	Miranda website
fio	Foreign institutional ownership	Factset
fioc	Foreign institutional ownership with values less than 0.01 is treated as 0	Factset
fio_us	US Foreign institutional ownership	Factset
fio_nus	Non-US Foreign institutional ownership	Factset
fio_common	Foreign institutional ownership of investors from common countries	Factset
fio_civil	Foreign institutional ownership of investors from civil countries	Factset
US Firm	Dummy variable equal to one for US firms	Factset
Never FIO	Dummy variable equal to one for firms that never obtain foreign institutional ownership in our sample	Authors' calculations
New FIO	Dummy variable equal to one for firms that obtain foreign institutional ownership for less than or equal to 3 years of FIO	Authors' calculations
Pre	A dummy variable for the years before a firm obtains foreign institutional ownership	Authors' calculations
Post	A dummy for the first time that a firm obtains foreign institutional ownership	Authors' calculations
B. Firm characteristics		
log_asset	Natural logarithm of total assets (*at*)	Compustat
lev	Leverage ratio (*(dlc + dltt)/at*)	Compustat
sale_growth	Annual sale growth	Compustat
bm	Book-to-market ratio	Compustat
roa	Return on total assets (*ebit/at*)	Compustat
cash	Cash ratio (*chee/at*)	Compustat
div	Dividend (*dv/nicon*)	Compustat
C. Country characteristics		
d_exrate	Change in the exchange rate with the US dollar	WDI
gdpgr	GDP growth of the country *c*	WDI

Table A.2 Summary Statistics

Variable	mean	sd	p25	median	p75
A. Main variables					
ret	-0.008	0.231	-0.073	0.000	0.063
vix	0.000	1.000	-0.671	-0.294	0.427
ebp	0.000	1.000	-0.489	-0.300	-0.009
mgfc	0.300	1.089	-0.381	0.212	0.688
d_vix	0.018	4.991	-2.500	-0.410	1.990
d_ebp	0.005	0.277	-0.120	0.010	0.145
d_mgfc	-0.023	0.295	-0.122	-0.006	0.117
fio	0.065	0.132	0.001	0.019	0.070
fioc	0.064	0.133	0.000	0.019	0.070
fio_us	0.032	0.112	0.000	0.000	0.000
fio_nus	0.033	0.052	0.000	0.011	0.046
fio_common	0.051	0.123	0.000	0.009	0.043
fio_civil	0.014	0.025	0.000	0.004	0.019
Never FIO	0.072	0.258	0.000	0.000	0.000
New FIO	0.495	0.500	0.000	0.000	1.000
B. Firm characteristics					
log_asset	6.016	2.538	4.437	6.126	7.642
lev	0.706	23.854	0.025	0.162	0.344
sale_growth	8.128	1174.267	-0.046	0.064	0.214
bm	1.695	10.572	0.538	0.941	1.556
roa	-0.200	12.781	-0.027	0.035	0.094
cash	0.184	0.218	0.031	0.094	0.253
div	0.314	12.166	0.000	0.000	0.253
C. Country characteristics					
d_exrate	-0.005	0.032	0.000	0.000	0.000
gdpgr	1.822	1.899	1.550	2.242	2.706

Table A.3 Correlation Matrix Among GFC Measures

	d_vix	*d_ebp*	*d_mgfc*	*vix*	*ebp*	*mgfc*
d_vix		0.458***	-0.710***	0.264***	0.039***	0.056***
d_ebp	0.458***		-0.637***	0.187***	0.180***	0.116***
d_mgfc	-0.710***	-0.637***		-0.436***	-0.336***	0.099***
vix	0.264***	0.187***	-0.436***		0.818***	-0.279***
ebp	0.039***	0.180***	-0.336***	0.818***		-0.395***
mgfc	0.056***	0.116***	0.099***	-0.279***	-0.395***	

Computed correlation used Pearson-method with listwise-deletion.

Table A.4 Yearly and Subsample Summary Statistics

year	#countries	#firms	Average (*fio*)	Average (*fio_us*)	Average (*fio_nus*)
2007	33	76,566	0.050	0.026	0.024
2008	31	74,238	0.054	0.028	0.026
2009	31	70,122	0.052	0.027	0.025
2010	28	68,011	0.057	0.028	0.029
2011	28	67,138	0.062	0.031	0.031
2012	29	68,829	0.064	0.033	0.031
2013	29	69,589	0.062	0.031	0.031
2014	30	69,509	0.065	0.032	0.033
2015	31	68,689	0.069	0.033	0.035
2016	30	66,293	0.073	0.035	0.037
2017	30	63,842	0.079	0.038	0.042
2018	31	62,257	0.085	0.039	0.046
2019	31	25,871	0.088	0.040	0.048

Table A.5 Determinants and Persistence of FIO

*The table reports results from fixed effects panel regressions with FIO ownership as the dependent variable. Column 1 includes firm and time fixed effects, while column 2 includes country and time fixed effects. Standard errors are clustered by firm in column 1 and by country and time in column 2. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.*

	(1)	(2)
Dependent Var.:	fio	fio
fio_{t-1}	0.9174***	0.9875***
	(229.8)	(452.4)
log_asset	0.0012***	0.0003***
	(9.692)	(5.932)
lev	2.14e-6***	9.52e-7***
	(2.891)	(4.760)
sale_growth	-2.24e-7***	-1.14e-7***
	(-47.63)	(-28.50)
bm	-1.48e-5	-1.58e-5***
	(-1.015)	(-5.165)
roa	-2.94e-6	-1.46e-6***
	(-1.329)	(-3.491)
cash	0.0023***	0.0013***
	(5.822)	(3.235)
div	7.59e-7	-2.97e-7
	(0.4212)	(-0.2033)
Fixed-Effects:		
Firm	Yes	No
Date	Yes	Yes
Country	No	Yes
SE Clustering	by: Firm	by: Country & Date
Observations	790,014	790,014
R2	0.99	0.99
Within R2	0.85	0.98

Table A.6. Within-Group Similarities for FIO and non-FIO Firms

This table reports the summary statistics of firm characteristics for firms with FIO less than or up to 3 years (Group A) and those with FIO over 3 years (Group B). We also test for the difference in the mean using Hotelling's T-squared and Multivariate Analysis of Variance (MANOVA) tests across the two groups. The firm characteristics include firm size (size), beta based on 60-month rolling estimation (beta), book-to-market ratio (bm), and momentum from month t-12 to month t-2 (momentum).

Group A: With FIO New FIO (<= 3 years)				
Variable	**Obs**	**Mean**	**SD**	**Coefficient of Variation (CV)**
size	176,305	5.61	2.14	0.38
beta_60m	176,305	1.22	0.79	0.65
bm	176,305	1.61	2.02	1.25
momentum	176,305	0.01	0.81	81.00
Group B: With FIO Old FIO (> 3 years)				
Variable	**Obs**	**Mean**	**SD**	**Coefficient of Variation (CV)**
size	347,792	6.88	2.03	0.30
beta_60m	347,792	1.20	0.63	0.53
bm	347,792	1.45	2.44	1.68
momentum	347,792	0.16	0.56	3.50
Difference between:	**Hotelling T-squared (p-value)**	**MANOVA (p-value)**		
Group A vs Group B	0.00	0.00		

Table A.7 Institutional Investors from Common Law vs Civil Law Countries excluding the US

*The table reports results from fixed effects panel regressions with stock returns as the dependent variable and the sample excluding US firms. Column 1 interacts FIO ownership from institutional investors from Common Law and Civil Law countries with the changes in the VIX as the measure for the GFC. Column 2 uses changes in the EBP as the GFC measure, and column 3 uses the factor from Miranda-Agrippino and Rey (2020). Standard errors are clustered by firm, and *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.*

	(1)	(2)	(3)
Dependent Var.:	ret	ret	ret
d_vix × fio_common	-0.0028***		
	(-4.756)		
d_vix × fio_civil	-0.0278***		
	(-7.664)		
d_ebp × fio_common		-0.0617***	
		(-5.830)	
d_ebp × fio_civil		-0.1324**	
		(-2.383)	
d_mgfc × fio_common			0.0683***
			(5.269)
d_mgfc × fio_civil			0.2869***
			(4.389)
fio	-0.0575***	-0.0570***	-0.0535***
	(-5.098)	(-5.068)	(-4.738)
log_asset	-0.0174***	-0.0170***	-0.0171***
	(-18.37)	(-18.62)	(-18.58)
lev	-2.41e-5	-2.02e-5	-1.22e-5
	(-1.584)	(-1.370)	(-0.6516)
sale_growth	1.92e-7***	1.72e-7***	1.66e-7***
	(10.41)	(9.904)	(8.846)
bm	0.0001***	0.0001***	0.0001***
	(3.469)	(2.847)	(3.171)
roa	5.71e-5	6.06e-5	6.58e-5
	(0.8927)	(0.9480)	(1.007)
cash	-0.0066*	-0.0050	-0.0053
	(-1.733)	(-1.351)	(-1.405)
div	2.16e-6	5.74e-7	4.68e-7
	(0.2334)	(0.0631)	(0.0514)
Fixed-Effects:			
Firm	Yes	Yes	Yes
Date	Yes	Yes	Yes
SE Clustering	by: Firm	by: Firm	by: Firm
Observations	752,915	789,972	785,192
R2	0.09	0.08	0.09
Within R2	0.002	0.001	0.002

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