Corporate Risk-taking, Foreign Institutional Ownership, and the Role of Country-level Corporate Governance

Abstract

Employing a large sample of 17,698 firms across 42 countries, we document a positive impact of foreign institutional ownership (*FIO*) on corporate risk-taking. Further, *FIO* is found to be a substitute for country-level corporate governance in determining corporate risk-taking. It supports the view that foreign institutional investors play an important role in motivating managers to take risk in countries with weaker corporate governance. Various robustness tests and careful considerations of endogeneity confirm our main conclusions.

JEL Classification: G32, G34.

Keywords: Foreign Institutional Ownership, Corporate Risk-taking, Country-level Corporate Governance.

1. Introduction

The significant growth of international capital flows bring various benefits to the world economy, such as promoting investee economic growth, reducing cost of capital via risk sharing, and enhancing invested firms' monetary capital base. Meanwhile, it also leads to negative impacts, such as destabilizing investee capital markets, and exposing invested firms to international risk and even financial crises. The empirical evidence on the impact of international capital flow is mixed.[1] As foreign capital becomes an increasingly important source of financing around the world (Bekaert et al. (2002)),[2] it is essential to understand the impact of foreign institutional ownership (*FIO*) on corporate decisions and performance.

Firms' performance and growth are fundamentally spurred by its risk-taking, which has been extensively examined from various perspectives in previous literature, including institutional environment (John et al. (2008)), large shareholder diversification (Faccio et al. (2011)), and ownership structure via privatization (Boubakri et al. (2013)), among many others. However, there is no study yet on the link between *FIO* and corporate risk-taking in an international context.[3] This paper fills this gap by investigating the impact of *FIO* on corporate risk-taking across the world. In doing so, it contributes to the existing literature by providing new evidence on how foreign institutional investors shape the operations of invested firms.

How does *FIO* impact corporate risk-taking? First, Boubakri et al. (2013) suggest that foreign institutional investors tend to implement riskier and more innovative projects through relevant capital budgeting decisions, such as introducing new production technologies and reducing operating costs. Further, foreign institutional investors also equip these firms with greater capabilities to take more risk. Specifically, they brings not only monetary benefits to firms, but also non-monetary benefits, such as human capital, business relationship, managerial skills,

[1] For instance, Bae et al. (2004) find that foreign investibility increases invested firms' stock return volatility, while Kim and Singal (2000) and Umutlu et al. (2010) find insignificant results. Bekaert and Harvey (2000) show that financial liberalization reduces firms' cost of capital. Aggarwal et al. (2011) demonstrate financial globalization improves firms' corporate governance practices, while Stulz (2005) reveals the limits of foreign shareholders due to insiders' agency problems.

[2] According to the World Investment Report 2010 and 2013, global foreign direct investments increased from $154 billion in 1991 to $1.35 trillion in 2013, and global foreign portfolio investments increased from $106 billion in 1991 to $744 billion in 2010.

[3] The most related study is Boubakri et al. (2013) which only examine 381 newly privatized firms.

marketing know-how, and new export market access (Stiglitz (2000); Li et al. (2011)). In addition, foreign institutional investors also improve the risk diversification and management of invested firms (Ferreira and Matos (2008); Li et al. (2011)) by broadening their investor base (Merton (1987); Gupta and Yuan (2009); Li et al. (2011)). It further increases the corporate risk-taking potential of invested firms. Bena et al. (2016) argue that a higher *FIO* is associated with significantly greater innovation output (i.e., patents filed by the invested firms), a likely outcome of risk-taking activities by invested firms.

Second, foreign institutional investors play a strong monitor role as they have fewer conflicts of interest with invested firms. In particular, foreign institutional investors take a more independent and active stance in terms of corporate governance practices, while domestic institutional investors have loyalty concerns with the management due to their business relations (Gillan and Starks (2003); Ferreira and Matos (2008); Aggarwal et al. (2011)). For example, foreign institutional investors demand management accountability and operation transparency (Li et al. (2011)), and improve the tools and incentives of the corporate governance of invested firms (Stulz (2005); Doidge et al. (2004)). Aggarwal et al. (2011) document that *FIO* increases the proportion of independent directors and prevent the invested firms from adopting staggered boards. John et al. (2008) and Boubakri et al. (2013) suggest that the improved corporate governance encourages firms to take more risk and result in better firm performance. In addition, Mitton (2006) and Ferreira and Matos (2008) find a positive association between *FIO* and the performance of invested firms. In contrast, domestic institutional investors are unlikely to have the same authority over the invested firms due to their existing business relationship with firm managers, which may prevent them from serving as efficient monitors.

Third, by investing capital in different countries, the investment portfolios of foreign institutional investors are more diversified compared to domestic institutional investors. They tend to take the advantage of their internationally-diversified portfolios and invest in riskier projects, as the firm-specific risk can be diversified away. Such advantage enables them to encourage managers to take more risk (Faccio et al. (2011)).

John et al. (2008) suggest that good country-level corporate-governance, such as strong investor protection and transparent information environment, promotes corporate risk-taking. Do

the cross-country differences in corporate governance enhance or attenuate the relation between *FIO* and corporate risk-taking? Our international data allow us to further investigate this research question. On the one hand, a stronger country-level corporate governance may strengthen the impact of *FIO* on corporate risk-taking. For example, Li et al. (2011) find that foreign institutional investors have greater impact on corporate risk-taking in emerging markets with stronger corporate governance. This is because strong shareholder protection and extensive disclosure requirements improve foreign institutional investors' ability to publicly challenge or privately pressure the managers. In addition, foreign institutional investors have less information disadvantage in countries with good corporate governance (Brennan and Cao (1997); Kang and Stulz (1997); Choe et al. (2005); Leuz (2006); Chan et al. (2008)). Therefore, country-level corporate governance complements *FIO* in determining corporate risk-taking. On the other hand, the impact of *FIO* on corporate risk-taking could be attenuated by strong country-level corporate governance. In particular, Aggarwal et al. (2011) find that the role of *FIO* in improving corporate governance is more pronounced for firms located in countries with weaker shareholder protection. In addition, Guedhami et al. (2009) find that the role of foreign investors in promoting the appointments of big-four auditors is strengthened in countries with weaker country-level corporate governance. The above analysis implies that *FIO* and country-level corporate-governance environment are substitutes. It is an empirical issue that whether *FIO* and country-level corporate governance are complements or substitutes. This paper tries to shed new light on this issue by employing an international sample.

Employing a large sample of 17,698 firms across 42 countries, we find that *FIO* (*DIO*) increases (decreases) corporate risk-taking. Further, *FIO* substitutes country-level corporate governance in determining corporate risk-taking. Our results also show that *FIO* from developed countries can enhance corporate risk-taking for firms in developing countries, but not the other way around. It supports the view that foreign institutional investors play an important monitoring role in motivating managers to take higher risk in countries with weaker corporate governance. Various robustness tests and careful examination of endogeneity confirm our conclusions.

This paper contributes to the current literature from the following aspects. First, it contributes to the *FIO* literature in an international context. An increasing number of studies focus the governance role of foreign institutional investors in cross-border M&As, including Rossi and

Volpin (2004), Bris and Cabolis (2008), and Ferreira et al. (2010). Further, Guedhami et al. (2009) argue that foreign investors reduce agency costs by improving accounting transparency and promoting the appointments of big-four auditors. In addition, foreign investors tend to invest in countries with better shareholder protection, legal framework, and accounting policies (Aggarwal et al. (2005); Bradshaw et al. (2004)) and avoid investments in poorly-governed firms (Doidge et al. (2009); Leuz et al. (2009)). Foreign investors also improve the corporate governance of invested firms, particularly financial information quality upon their privatization (Dyck (2001); Boubakri et al. (2007)). Other evidence of governance role of foreign institutional investors comes from the perspectives of capital market liberalization (Stulz (1999)), cross listing (Doidge (2004); Doidge et al. (2009)), and delisting in high-disclosure countries (Marosi and Massousd (2008)). We show that *FIO* plays a strong monitoring role and encourages corporate risk-taking, which confirms the spillover effect of corporate governance across borders (Aggarwal et al. (2011)).

This paper identifies that corporate risk-taking is one of the channels through which foreign institutional investors could improve the corporate governance and valuation of invested firms, thus, complementing Ferreira and Matos (2008) and Aggarwal et al. (2011).[4] Our findings support Aggarwal et al. (2011) that *FIO* promote the convergence towards better corporate governance worldwide by influencing the management teams using voting rights or exiting from the invested firms. The study that most resembles our paper is Boubakri et al. (2013) which show that *FIO* promotes corporate risk-taking by employing a sample of 381 newly privatized firms across 57 countries. They focus on the shift of ownership structure from state ownership to foreign ownership during privatization process, and argue that the latter are more risk oriented compared to the former. Our paper focuses on the role of *FIO* in shaping corporate risk-taking. We hypothesize that *FIO* can increase corporate risk-taking as they improve the corporate governance of invested firms. Therefore, the context and comparison of foreign ownership are different in these two papers, with the different results not necessarily contradicting each other. Moreover, Boubakri et al. (2013) find *FIO* and country-level corporate governance are complements in determining corporate risk-taking, while we find they are substitutes. Our paper not only

[4] Ferreira and Matos (2008) and Aggarwal et al. (2011) find that the improved firm-level corporate governance can lead to higher firm value. Aggarwal et al. (2011) identify the major channels through which foreign institutional investors enhance the value of invested firms, including board independence, lower likelihood of CEO duality and stagger board, and the termination of poorly performing CEOs.

significantly expands their sample beyond the 381 newly privatized firms, but also finds results that are arguably more informative and general based on a much larger sample including both post-privatized firms and private firms.

Second, this paper contributes to the literature on the determinants of corporate risk-taking. It complements prior literature which ignores the role of *FIO* in determining corporate risk-taking. More specifically, prior literature examines the impact of institutional environment (Li et al. 2013), shareholder diversification (Faccio et al. (2011)), and privatization (Boubakri et al. (2013)) on corporate risk-taking. We examine a large sample consists of 17,698 firms across 42 countries and find that *FIO* promotes corporate risk-taking by improving the corporate governance of invested firms. Related literature examines the impact of ownership concentration on corporate risk-taking and finds ambiguous results. For example, Anderson and Reeb (2003) document that a higher founder family ownership is associated with higher corporate risk-taking, while John et al. (2008) find insignificant effects of large shareholder ownership concentration and corporate risk-taking. This paper sheds new light on this important issue.

Third, this paper contributes to the literature on the role of formal and informal institutional environments in influencing corporate risk-taking. For the former, John et al. (2008) document that better investor protection can increase firm value-enhancing investments with higher risk. Acharya et al. (2011) find that stronger creditor rights in bankruptcy discourage corporate risk-taking. For the latter, Li et al. (2013) document that national culture significantly influences corporate risk-taking (i.e., a positive impact for individualism and a negative impact for uncertainty avoidance and harmony). Our paper documents that country-level corporate governance and *FIO* are substitutes in determining corporate risk-taking.

The remainder of paper is organized as follows. Section 2 provides hypothesis development. Section 3 presents empirical model. Section 4 describes data and sample. Sections 5-9 present empirical results and Section 10 concludes the paper.

2. Hypothesis Development

Due to career and reputation concerns, managers tend to avoid risky projects even when the projects can enhance firm value (Amihud and Lev (1981); Myers and Majluf (1984); Holmstrom

and Ricart I Costa (1986); Hirshleifer and Thakor (1992)). Unlike shareholders who are able to diversify their own portfolios, managers are unable to diversify their labor income. Thus, they tend to be risk averse to risky projects. Corporate risk-taking is fundamentally important as it is directly linked to corporate and economic growth (John et al. (2008)). As a result, motivating corporate risk-taking becomes a key concern to academia and industry practitioners. Existing research focuses on aligning the interests of managers with shareholders by using various country-level economic mechanisms (e.g., investor protection) and microeconomic mechanisms (e.g., equity-based compensation), so that managers are incentivized to take sufficient risk.

This paper focuses on how institutional ownership affects corporate risk-taking across the world. Foreign and domestic institutional investors are expected to have opposite effects on corporate risk-taking. *FIO* is expected to promote corporate risk-taking, because (1) foreign institutional investors introduces both monetary and non-monetary capital (e.g., human capital, business relationship, managerial skills, marketing know-how, and new export market access), allowing them to more effectively push firms to implement riskier projects (Stiglitz (2000); Li et al. (2011)). In addition, they also improve the risk diversification and management of invested firms (Ferreira and Matos (2008); Li et al. (2011)) by broadening the investor base (Merton (1987); Gupta and Yuan (2009); Li et al. (2011)), (2) the relative independence of foreign institutional investors allows them to play as strong monitors, thus improving the corporate governance of invested firms (Gillan and Starks (2003); Ferreira and Matos (2008); Aggarwal et al. (2011)), and (3) the investment portfolios of foreign institutional investors are more diversified. Thus, they tend to encourage managers to take more risk (Faccio et al. (2011)). In contrast, domestic institutional investors are less independent than foreign institutional investors, implying that they could be worse monitors and would less effectively motivate managers to take risk. Therefore, we form the following hypotheses,

Hypothesis 1 (H1): *Foreign institutional ownership is significantly and positively related to corporate risk-taking.*

Hypothesis 2 (H2): *Domestic institutional ownership is significantly and negatively related to corporate risk-taking.*

Existing research indicates that good country-level corporate governance, such as strong investor protection and transparent information environment, promotes corporate risk-taking (John et al. (2008)). It is natural to further examine how *FIO* and country-level corporate governance jointly determining corporate risk-taking.

On the one hand, Li et al. (2011) find that foreign institutional investors have greater impact on corporate risk-taking in emerging markets with stronger corporate governance. In addition, due to the information disadvantage of foreign institutional investors (Brennan and Cao (1997); Kang and Stulz (1997); Choe et al. (2005); Leuz (2006); Chan et al. (2008)), their impact on corporate risk-taking is expected to be stronger in countries with good corporate governance where investors are well protected and information is more creditable. It implies that country-level corporate governance enhances the impact of *FIO* on corporate risk-taking. That is, *FIO* and country-level corporate governance are complements.

On the other hand, Aggarwal et al. (2011) suggest that good corporate governance practices "travel around the world" through institutional investors. That is, foreign institutional investors substitutes the poor institutional environment via the corporate governance spill-over effect (i.e., foreign investors from countries with better corporate governance bring substantial improvements in firm-level corporate governance to the invested firms in countries with weak corporate governance) (Bris and Cabolis (2008)). Rossi and Volphin (2004) find that firms based in weaker legal environment are more frequently acquired by firms from stronger legal environment. In addition, Guedhami et al. (2009) find that the role of foreign investors in promoting the appointments of big-four auditors is strengthened in countries with weaker country-level corporate governance. That is, the role of *FIO* is expected to be stronger if the firms are located in countries with weak corporate governance. Conversely, in a country with good corporate governance, domestic investors are able to advance their interests successfully and easily influence managers to adopt riskier projects. Thus, the presence of foreign institutional investors is less likely to exert strong impact on corporate risk-taking. The above analysis implies that *FIO* and country-level corporate-governance environment are substitutes. Our above analysis leads to the following hypotheses,

Hypothesis 3a (H3a): *Foreign institutional ownership and country-level corporate governance*

are complements in determining corporate risk-taking.

Hypothesis 3b (H3b): *Foreign institutional ownership and country-level corporate governance are substitutes in determining corporate risk-taking.*

3. Empirical Design

3.1 Empirical Model

To examine the relation between foreign (and domestic) institutional ownership and corporate risk-taking, we estimate the following model,

$$Risk\_taking_{i,t} = \alpha + \beta_1 FIO_{i,t} + \beta_2 DIO_{i,t} + \beta_3 CONTROLS_{i,t} + \varepsilon,$$

where firm is indexed by *i* and year by *t*. *Risk_taking* is the corporate risk-taking variable (see detail in Section 3.2). The foreign (domestic) institutional ownership (*FIO* (*DIO*)) is calculated by aggregating the equity holdings of foreign (domestic) institutions as a percentage of firm's market capitalization. *CONTROLS* denotes a set of firm- and country-level control variables that have been shown to influence corporate risk-taking in pervious literature (Boubakri et al. (2013)), including return on assets (*ROA*), financial leverage (*LEVERAGE*), firm size (*SIZE*), sales growth (*SALESGROWTH*), capital expenditure (*CAPEX*), GDP growth (*GDPGROWTH*), economic freedom index (*ECONFREEDOM*), GDP per capita (*GDP*), and market interest rates (*IR*).[5] In addition, we include year-, industry-, and country-fixed effects to control for the unobserved year, industry, and country determinants of corporate risk-taking. Standard errors are clustered at country level. If β_1 (β_2) is positive (negative) and significant, then **H1** (**H2**) is supported. That is, *FIO* (*DIO*) increases (decreases) corporate risk-taking.

To examine the whether *FIO* and country-level corporate governance are complements or substitutes in determining corporate risk-taking, we estimate the following model,

$$Risk\_taking_{i,t} = \alpha + \beta_1 FIO_{i,t} + \beta_2 FIO_{i,t} \times CG + \beta_3 DIO_{i,t} + \beta_4\, DIO_{i,t} \times CG$$

[5] Variable definitions are provided in the Appendix A.

$$+ \beta_5 CG + \beta_6 CONTROLS_{i,t} + \varepsilon,$$

where *CG* denotes a particular country-level corporate-governance variable (see detail in Section 3.3). If the coefficient estimate of *FIO*×*CG* (i.e., β_2) is positive (negative) and significant, then **H3a** (**H3b**) is supported. That is, *FIO* complements (substitutes) the role of country-level corporate-governance in determining corporate risk-taking.

3.2 Corporate Risk-taking Variables

Our primary corporate risk-taking variable (*RISK1*) is based on the *ROA* volatility of firms. Following existing literature (John et al. (2008); Hilary and Hui (2009); Acharya et al. (2011); Faccio et al. (2011); Boubakri et al. (2013)), *RISK1* is constructed as the volatility of firms' *ROA* over a five-year overlapping period (i.e., year 0 to +4). *ROA* is the ratio of earnings before interest and taxes to total assets.

We also construct alternative corporate risk-taking variables that are widely used in the literature, including (1) the earnings range (*RISK2*), defined as the maximum minus the minimum *ROA* over the overlapping five-year window, (2) the country-adjusted earnings volatility (*RISK3*), and (4) the country-industry-adjusted earnings volatility (*RISK4*). In addition, we employ a risk-taking variable (*SRVOL*) at market level, calculated as the standard deviation of monthly stock returns over a two-year period (i.e., 0 to +1).

3.3 Country-level Corporate-governance Variables

The first set of country-level corporate-governance variables focuses on the information environment of each country. In particular, Financial Transparency Index (*FINTRA*) measures of the availability of financial information to those outside the firm, and Financial Analysts Index (*ANALYST*) is the number of analysts following the largest 30 companies of each country. Further, Overall Transparency Score (*OTSCO*) measures the institutional and political transparency. In addition, Disclosure Requirements Index (*DISREQ*) measures the degree of disclosure requirements, and Liability Standard Index (*LIASTA*) measures the procedural difficulty in recovering losses from the issuer, distributors, and accountants. A higher score of these indexes indicates better information availability and credibility.

The second set of country-level corporate-governance variables focus on the legal origin, shareholder protection, and control of corruption of each country. In particular, *LEGCOM* is a dummy variable equals one if a country adopts common law system (which provides better shareholder protection than the civil law system), and zero otherwise, and *ANTID* measures the level of shareholder protection of each country. Further, Corporate Governance Index (*CGI*) measures the percentage of firms in the country satisfies the following perspectives: protection of minority shareholders, quality of training, willingness to delegate authority, nepotism and corporate governance. In addition, Control of Corruption (*COC*) captures the perceptions of the extent to which public power is exercised for private gain. A higher score of these indexes indicates stronger shareholder protection and better control of corruption.

4. Data and Sample

Firm-level accounting data, stock return, and country-level control variables are collected from Worldscope, Datastream, and World Development Indicators (WDI), respectively. Foreign and domestic institutional ownership data is collected from FactSet Ownership (LionShares) database. Country-level corporate-governance variables are obtained from La Porta et al. (1998), Bushman et al. (2004), Kaufmann (2004), Bellver and Kaufmann (2005), La Porta et al. (2006), and Kaufmann et al. (2009).

To construct the corporate risk-taking variables, we require at least five consecutive years of earnings data to be available for a firm (i.e., beginning from the current year). To reduce the outlier effect, firm-level variables are winsorized at 1st and 99th percentiles. If any variable of interest is missing in a given year, we remove the firm-year observation. We also exclude the financial and regulated utility firms. Finally, our sample consists of 17,698 firms (i.e., 115,726 firm-year observations) across 42 countries from 2000 to 2011.[6]

Table 1 reports the sample distribution by country, year, and industry, respectively. As shown in Panel A, the sample coverage is better for developed countries than developing countries. In particular, the U.S. contributes most firm-year observations to the sample (i.e., 31,928 firm-year

[6] The sample starts from 2000 since the institutional ownership data is not available prior to 2000 in Factset. We collect the accounting data till 2015, enabling us to construct the corporate risk-taking variables till 2011. For example, the *ROA* values from 2011 to 2015 are used to calculate *RISK1* in 2011. Thus, our sample ends in 2011.

observations or 27.59 percent of sample). In the robustness, we examine the subsample that excludes U.S. firms, the results are unchanged. Panel B shows that more firm-year observations are available in the later years due to better data availability, and Panel C shows that our sample covers firms from various industries.

[Insert Table 1]

Table 2 reports the summary statistics of corporate risk-taking, foreign and domestic institutional ownership, and firm- and country-level control variables. It is not a surprise that the statistics of our corporate risk-taking variables are different from Boubakri et al. (2012) as their sample only covers 381 privatized firms. In general, the key explanatory variables resemble those used in the literature. For example, the mean of *FIO* and *DIO* are 0.041 and 0.174, respectively.

[Insert Table 2]

5. Baseline Results

5.1 Does Foreign (Domestic) Institutional Ownership Increases (Decreases) Corporate Risk-taking?

Table 3 presents the coefficient estimates by regressing corporate risk-taking variables on foreign and domestic institutional ownership. The results show that *FIO* (*DIO*) is positively (negatively) related to all five corporate risk-taking variables at the 1% significance level, indicating that *FIO* (*DIO*) promotes (reduces) corporate risk-taking. The results are not only statistically significant, but also economically significant. As shown in Column 1, the coefficient estimate (p-value) of *FIO* and *DIO* are 0.053 (0.000) and -0.025 (0.000), respectively. That is, a one-standard-deviation increase in *FIO* (*DIO*) is associated with a 5.5% (= 0.053×0.070/0.067) increase (10.2% (= 0.025×0.274/0.067) decrease) in *RISK1* relative to its sample mean, given the standard deviation of *FIO* (*DIO*) is 0.070 (0.274) and the mean of *RISK1* is 0.067. The results support **H1** and **H2.** That is, firms with a higher *FIO* (*DIO*) tend to take higher (lower) risk.

[Insert Table 3]

5.2 Foreign Institutional Ownership and Country-level Corporate Governance:

Complements or Substitutes?

To examine whether *FIO* and country-level corporate governance are complements or substitutes, we include country-level corporate-governance variable and its interaction with *FIO* (i.e., *FIO*×*CG*) in the regressions. If the coefficient estimate of *FIO*×*CG* is significant and positive (negative), then **H3a** (**H3b**) is supported. That is, *FIO* and country-level corporate-governance are complements (substitutes).

We employ a series of variables to measure different aspects of country-level corporate governance, including information environment (*FINTRA, ANALYST, ACCSTD, OTSCO, DISREQ,* and *LIASTA*), legal origin (*LEGCOM*), shareholder protection (*ANTID* and *CGI*), and control of corruption (*COC*). As shown in Table 4, the coefficient estimates of *FIO*×*CG* are negative and significant for all country-level corporate governance variables except ACCSTD, however the sign is still negative.[7] For example, Column 1 shows that the coefficient estimate (p-value) of *FIO*×*FINTRA* is -0.034 (0.003). That is, a one-standard-deviation increase in *FIO* is associated with a 9.2% (= (0.096-0.034×0.234)×0.070/0.067) increase in *RISK1* relative to its sample mean in the countries with a lower *FINTRA* (e.g., *FINTRA* = 0.234 in Malaysia), compared to a 4.4% (= (0.096-0.034×1.590)×0.070/0.067) increase in *RISK1* relative to its sample mean in the countries with a higher *FINTRA* (e.g., *FINTRA* = 1.590 in the U.S.). As shown in Columns 2-10, the results are similar to those in Column 1. In particular, *FIO*×*CG* is negatively and significantly related to *RISK1* by using alternative country-level corporate-governance variables. It suggests that the positive impact of *FIO* on corporate risk-taking is attenuated by good country-level corporate governance. Thus, the results support **H3b**, indicating that *FIO* and country-level corporate governance are substitutes in determining corporate risk-taking.

[Insert Table 4]

To further confirm the above findings, we create two subsamples, one consists of firms in developing countries (i.e., developing country investee), and the other consists of firms in developed countries (i.e., developed country investee). Then, we examine the impact of *FIO* from

[7] For brevity, we only reports the results by using *RISK1* as corporate risk-taking variable. The results are qualitatively similar by using *RISK2, RISK3, RISK4,* or *SRVOL* as dependent variable.

developed (i.e., $FIO_{Developed}$) and developing (i.e., $FIO_{Developing}$) countries on corporate risk-taking in each subsample.

Table 5 shows that $FIO_{Developed}$ positively and significantly impacts corporate risk-taking for both developing and developed investee countries, while the coefficient estimates of $FIO_{Developing}$ are positive but insignificant. It suggests that foreign institutional investors from developed countries can enhance the risk-taking of invested firms, but not those from developing countries. Remarkably, $FIO_{Developed}$ shows a larger scale of impact on corporate risk-taking in developing investee countries (as shown in Column 1) compared to those in developed investee countries (as shown in Column 2). In particular, the coefficient estimate of $FIO_{Developed}$ is 0.057 in Column 1 compared to 0.051 in Column 2. That is, for the firms in developing (developed) investee countries, a one-standard-deviation increase in $FIO_{Developed}$ is associated with a 8.7% (4.9%) increase in *RISK1* relative to its sample mean.[8] It indicates that the impact of $FIO_{Developed}$ on corporate risk-taking is smaller in developed investee countries which are presumed to have stronger corporate governance. This lends further support to **H3b** that country-level corporate governance substitutes the role of *FIO* in influencing corporate risk-taking.

[Insert Table 5]

In sum, our results demonstrate a substitution effect between *FIO* and country-level corporate governance. That is, foreign institutional investors effectively motivate corporate risk-taking in countries with weaker corporate governance, and this monitoring role is attenuated in countries with stronger corporate governance.

6. Endogeneity Tests

We shows that *FIO* is positively and significantly related to corporate risk-taking. However, it is possible that foreign institutional investors are attracted to invest in firms with higher corporate risk-taking (i.e., reverse causality), or an unobserved factor could affect both *FIO* and corporate risk-taking (i.e., endogeneity). For example, firms with an effective corporate-governance

[8] 8.7% = 0.057×0.070/0.046 (4.9% = 0.051×0.070/0.072), where 0.070 is the standard deviation of $FIO_{Developed}$ and 0.046 (0.072) is the sample mean of *RISK1*.

mechanism may attract more investments from foreign institutional investors (Leuz et al. (2009)). Meanwhile, an effective corporate-governance mechanism may also motivate managers to take more risk. To tackle the reverse causality and endogeneity issues, we adopt both regression-based and event-study approaches that are described as follows.

6.1 Regression-based Approaches

We carefully address the endogeneity issue by employing four different regression-based approaches. The first approach is based on a subsample analysis. Due to the nature of our risk-taking variables (i.e., five-year forward looking *ROA* volatility), it is likely that there is high autocorrelation between consecutive years of corporate risk-taking variables. To partially address this issue, we examine the baseline regression based on a subsample assuring that there are no overlaps in the risk-taking variables. In particular, the subsample includes the observations in years 2000, 2005, and 2010. As shown in Column 1 of Table 6, the results are unchanged, suggesting that our findings are less likely driven by the autocorrelation between the consecutive years of risk-taking variables.

[Insert Table 6]

The second approach is to use the "difference" regressions. In particular, we take the one-year (or five-year) difference of each variable and examine the baseline regression with these differenced variables. By taking the difference, we remove the time-invariant firm characteristics that could drive the relationship between *FIO* and corporate risk-taking. Columns 2-3 of Table 6 present the results of "one-year-difference" and "five-year-difference" regressions, respectively. The results remain unchanged.

The third approach is to use firm-fixed effect regressions. Although, it attempts to address a similar endogeneity issue compared to the "difference" regressions, the relative efficiency of these two approaches depends on the underlying process of the error term. It is important to examine whether the results are consistent by using both approaches. As shown in Column 4 of Table 6, the results are similar to those in the "difference" regressions.

The fourth approach is to use two-stage least squares (2SLS) regressions. We use the

membership in the Morgan Stanley Capital International (MSCI) All Country World Index to instrument for *FIO* (Aggarwal et al. (2011); Luong et al. (2016)). The MSCI index is a free float-adjusted market capitalization weighted index designed to measure the performance of global equity markets. On one hand, foreign institutional investors rely on MSCI index as the benchmark in their foreign investments. Thus, the MSCI membership creates a possible exogenous variation in *FIO*. In particular, Ferreira and Matos (2008) and Leuz et al. (2009) find that foreign institutional investors invest more equity in firms with MSCI membership. On the other hand, it is unlikely that MSCI membership directly impacts firms' risk-taking behaviour. We define the instrumental variable (*MSCI*) as a dummy equals one if a firm is included in the MSCI All Country World index, and zero otherwise. Column 5 of Table 6 presents the 2SLS results by using *MSCI* as an instrumental variable. The results remain consistent with our baseline regression.

In addition, we use the geographic distance (*DISTANCE*) between the investor and investee countries as an instrumental variable. *DISTANCE* significantly deters foreign investments in general (Daude and Fratzscher (2008) and Javorcik and Wei (2009)) and foreign equity investments in particular (Portes and Rey (2005), Di Giovanni (2005), Papaioannou (2009), and Aggarwal et al. (2012)). Thus, *DISTANCE* is expected to have a negative impact on *FIO*. On the other hand, it is less likely that *DISTANCE* can directly impact corporate risk-taking in the investee countries. *DISTANCE* is constructed as the natural logarithm of the weighted average geographic distance between investor country and investee country.[9] The weight is computed as the market value of investors' portfolio divided by the market capitalization of the invested firm. Column 6 of Table 6 shows that the results still hold.

The bottom panel of Table 6 reports diagnostic tests to assess the validity of the instrumental variables. First, both instrumental variables satisfy the rank condition since the p-value of the Kleibergen-Paap rk LM statistic is 0.001 and 0.000 for *MSCI* and *DISTANCE* respectively, rejecting the null hypothesis that the equation is under-identified. A test on the significance of the instrumental variables in the first-stage regressions yields an F statistic of 71.643 and 26.500 for *MSCI* and *DISTANCE* respectively, exceeding Staiger and Stock (1997)'s rule of thumb value of

[9] Geographic distance data is obtained from Mayer and Zignago (2011). The distance is based on the great circle formula, which uses latitudes and longitudes of the most important cities/agglomerations (in terms of population). The distance also incorporates the internal distance based on areas.

10, as well as Stock and Yogo (2005)'s 10% critical value for one instrument and one endogenous regressor (i.e., 16.38). These results reject the null hypothesis that the instruments are weak.[10] Therefore, the diagnostic tests strongly support the validity of the 2SLS regression results.

6.2 Stock Additions (Deletions) to (from) the MSCI Index

To address the causality issue, we examine the change of corporate risk-taking around the stock additions (deletions) to (from) the MSCI index. In particular, we carry out the Difference-in-Difference (DiD) estimations around these two events. There are 244 (99) stock additions (deletions) in our sample, which are considered as treated firms. For each treated firm, we match a control firm with replacement in the same country and year by using the nearest-neighbor-propensity-score matching approach. We match the 244 additions (99 deletions) treated firms to 216 (85) control firms.

We design the DiD approach around our results from Table 7 Columns 1 and 3, which shows that our results remain hold under a subsample analysis without overlaps of the risk-taking variable and five-year differences, respectively.

Specifically, we estimate a logit model where the dependent variable equals one if a firm experience a stock addition (deletion), and zero otherwise. The logit model control for the same set of independent variables as those used in the baseline regression.[11] In addition, we also include the one-year risk-taking growth variable (i.e., $Growth_{RISK1}$) to ensure the parallel trend assumption of DiD approach is satisfied. Then, each treated firm is matched based on the estimated propensity score to the nearest neighbor control firm in the same year and country.

Panel A of Table 7 reports the results of examining of equality of the pre-event means between the treated and control firms. We find that the pre-event $Growth_{RISK1}$ is not significantly

[10] Instruments are weak if the conventional α-level Wald test based on instrumental variable statistics has an actual size that could exceed a certain threshold, for example, 10% if the true rejection rate is 5% (Stock et al. (2002)). For one endogenous regressor and one instrument, the tabulated critical value for an actual size of 10% is 16.38. Since our Kleigbergen-Paap (2006) rk Wald statistic of 71.643 and 26.500 (i.e., the same as F statistic in our context) far exceeds the 10% critical value, the maximum size distortion is no larger than 5%. Therefore, our results are not affected by weak instrument problem.

[11] To assure that there are no overlaps in *ROA* values between the pre-event and post-event periods, the pre-event period -1 and -2 is equivalent to -5 and -6 in our sample. For pre-event period -1 we use *ROA* volatility from -5 to -1 to represent our risk-taking variable.

different between the treated and control firms. In addition, we are unable to reject the hypothesis of equal means between covariates of the treated and control firms. This result suggests that there are no significant differences in pre-event covariates and trend between the two groups, which provides evidence to support the parallel trend assumption.

[Insert Table 7]

Panel A (B) of Figure 1 shows the evolution of the average differences in *RISK1* between the treated and control firms two years before and after the stock addition (deletion). The events occur between year (-1 to 0). We find that the figures in both panel follow a relative parallel trend in the pre-event period. As shown in Panel A (B), we find that the differences in corporate risk-taking between treated and control firms are significant increased (decreased) after the stock addition (deletion). This provides further support for our identification strategy.

Following our previous analysis, we conduct the DiD estimation in a multivariate regression framework by estimating the following model,

$$Risk\_taking_{i,t} = \alpha + \beta_1 TREAT_i \times POST_t + \beta_2 DIO_{i,t} + \beta_3 CONTROLS_{i,t} + \varepsilon,$$

where *TREAT* is a dummy variable equals one if a firm experience a stock addition (deletion), and zero otherwise. *POST* is a dummy variable indicates the post-event years. The key variable of interest is *TREAT*×*POST*, which captures the difference in corporate risk-taking between treated and control firms following a stock addition (deletion) to (from) the MSCI index.

Panel B of Table 7 reports the results of multivariate regression framework. The dependent variables are *FIO* in Columns 1 and 2. The positive (negative) and statistically significant coefficient estimates of *TREAT*×*POST* indicate that, on average, treated firms receive a significant increase (decrease) in *FIO* following the stock addition (deletion) to (from) the MSCI index. The dependent variables are *RISK1* in Columns 3 and 4. The coefficient estimates of *TREAT*×*POST* are positive (negative) and statistically significant, indicating that the treated firms experience a significant increase (decrease) in corporate risk-taking relative to control firms after a stock is added (deleted) to (from) the MSCI index. In sum, the results support our earlier findings, and show that the exogenous variations in *FIO* from stock addition (deletion) to (from) the MSCI index

significant increase (decrease) corporate risk taking.

7. Possible Economic Mechanisms

7.1 Monitoring

The agency problems between managers and shareholder arise due the separation of ownership and control. Due to career and reputation concerns, risk-averse managers may choose not to take risky projects even when they can enhance firm value. The monitoring role of foreign institutional investors is an important governance mechanism to mitigate such agency problems. This section examines whether *FIO* could impact corporate risk-taking through its monitoring role.

Prior literature suggests different types of institutional investors have different preferences and behaviors (Almazan et al. (2005); Chen et al. (2007)). Brickley et al. (1988) suggest that mutual funds and investment advisers tend to be active monitors, while banks and insurance companies are more supportive of management actions. Ferreira and Matos (2008) suggest that *independent institutions*, such as mutual funds and investment advisers, actively collect information, subject to fewer regulatory restrictions, and have fewer potential business relationships with the invested firms. That is, they play a strong monitoring role, and possibly intervene management decisions. In addition, Chen et al. (2007) find that *independent institutions* engage more in collecting information and involving in management decisions of the invested firms. Conversely, *grey institutions*, such as, bank, insurance companies, pension funds and endowments have higher monitoring costs and are more loyal to corporate management, and they are more likely to hold shares without reacting to management actions of the invested firms.

To examine whether the impact *FIO* on corporate risk-taking is varied for different types of institutional investors, we construct FIO_{Type} representing the *FIO* for a particular type of institutions. Table 8 presents the estimating results of corporate risk-taking on *FIO* for each institution type. Columns 3, 4, and 6 shows that *FIO* is positively and significantly related to corporate risk-taking for *independent institutions*, including mutual funds, investment advisors, and hedge funds and venture capital. As shown in Column 7, the results are unchanged if we use an aggregated measure of *independent institutions* (i.e., $FIO_{Independent}$). On the other hand, Columns 1, 2, and 5 show insignificant results for *grey institutions*, including banks, insurance

companies, and pension funds and endowment. It indicates that foreign *independent institutions* actively and effectively monitor the firm, in turn influencing the corporate risk-taking of the invested firms.

[Insert Table 8]

Bushee (1998) suggests that frequent-trading institutional investors encourage managers to pursue short-term earnings goals, while long-term institutional ownership serves to reduce managers' pressure and to pursue long-term investment. Chen et al. (2007) find that long-term institutions focus more on monitoring rather than trading.

To examine whether long-term *FIO* impact corporate risk-taking, we construct $FIO_{Long-term}$ representing the *FIO* held by long-term institutional investors. Following Gasper et al. (2005) and Bena et al. (2016), we measure the investment horizon by constructing investors' annual portfolio turnovers (i.e., churn rate or *CR*).

$$CR_{v,t} = \frac{\sum_{i \epsilon Q} \left| N_{i,v,t} P_{i,t} - N_{i,v,t-1} P_{i,t-1} - N_{i,v,t-1} \Delta P_{i,t} \right|}{\sum_{i \epsilon Q} \frac{N_{i,v,t} P_{i,t} + N_{i,v,t-1} P_{i,t-1}}{2}},$$

where firm is indexed by *i*, investor by *v*, and year by *t*. *Q* is the set of firms that are held by investor *v*. *P* and *N* are the share price and the number of shares outstanding, respectively. Short-term investors tend to buy and sell their investments frequently, while long-term investors tend to hold their investments for a longer period. Thus, short-term investors should have a higher *CR* than long-term investors. We then calculate the yearly average *CR* of each investor to represent their investor horizons. An investor is classified as a long-term investor if their yearly-average *CR* is below the median of yearly-average *CR* across all institutional investors.

As shown in Column 8 of Table 8, the coefficient estimate of $FIO_{Long-term}$ is positive and statistically significant at 1% level. $FIO_{Excluding\ long-term}$ is also positively related corporate risk-taking, but the magnitude is relative small compared to $FIO_{Long-term}$ (i.e., 0.041 compared to 0.053). Nevertheless, the results indicate that the positive impact of *FIO* on corporate risk-taking is concentrated for long-term foreign institutional investors.

Overall, it indicates that the positive impact of *FIO* on corporate risk-taking is largely driven by the monitoring channel.

7.2 International Diversification

The benefits associated with international diversification have been discussed extensively in previous literature. For example, De Roon et al. (2001) argue that international diversification benefits are smaller for U.S. investors, while Driessen and Laeven (2007) find that the benefits of overseas investments are higher for investors from developing countries.

Foreign institutional investors have higher incentives to push managers to pursue riskier investments if they can reduce their overall portfolio risk through international diversification. In this section, we examine how investors' portfolio risk reduction achieved through international diversification can change their attitude towards corporate risk-taking.

To measure the extent of international diversification, we use three frequently used international diversification (*ID*) variables, including the International Diversification Index (*IDI*), Country Count (*CC*), and Foreign Portfolio Ratio (*FPR*) (Denis et al. (2002); Duru and Reeb (2002); Thomas (2002)). *IDI* is the complement of the Herfindahl Index (*HHI*) with a range from 0 to 1,

$$IDI = 1 - HHI = 1 - \sum_{j=1}^{N} s_j^2,$$

where s_i denotes the market share of foreign institutional investors' portfolios in country *j*. *CC* is defined as the number of foreign markets in foreign institutional investors' portfolios. *FPR* is the percentage of foreign institutional investors' portfolios invested in foreign markets. A higher value these variables indicates a higher level of international diversification. Next, we construct FIO_{High_ID} (FIO_{Low_ID}) as the ownership by internationally (under-) diversified foreign institutional investors, defined as those with *ID* measures above (below) its median. Then, examine its impact on corporate risk-taking.

Columns 1-3 of Table 9 show the coefficient estimates of FIO_{High_ID} (FIO_{Low_ID}) are positive and significant at 1% level (insignificant). It suggests that the motivation for foreign

institutional investors to push managers to take higher risk is largely attributable to the ability of foreign institutional investors to diversify their portfolios internationally.

In addition, we construct an aggregate *IDI* for all investors of a firm by weighting *IDI* by their percentage of ownership of the firm,

$$IDI_{IO} = \sum_{i=1}^{N} w_i IDI_i,$$

where w_i is the percentage of ownership of institutional investor i. Then, we separate IDI_{IO} into IDI_{FIO} and IDI_{DIO} to represent the weighted-average *ID* of foreign and domestic institutional investors, respectively.

Column 4 shows that the coefficient estimate of $FIO \times IDI_{FIO}$ is positive and significant, indicating that the positive impact of *FIO* on corporate risk-taking is concentrated for internationally diversified foreign institutional investors. However, the result disappears for *DIO*. In particular, the coefficient estimates of both *DIO* and $DIO \times IDI_{DIO}$ are insignificant. This suggests that the effect of international diversification on risk-taking is only evident for foreign institutional investors. We hypothesize that although domestic institutional investors can also achieve risk reduction through international diversification, they are less effective in motivating managers due to their existing relationship with corporate management.

[Insert Table 9]

In sum, we find that foreign institutional investors with highly diversified international portfolios are more pronounced in promoting corporate risk-taking in invested firms. This is attributed to their ability to diversify away the firm-specific risk in their internationally positioned portfolios. However, this effect does not exist for domestic institutional investors due to their business ties with invested firms.

8. Innovation

Previous literature suggests that foreign institutional investors encourage innovation by playing an active monitoring role, and by providing managers with insurance against failures in innovative activities. In addition, they also act as a bridge for knowledge spillovers to travel internationally

contributing to the innovation capacity of invested firm (Guadalupe et al. (2012); Luong et al. (2017)). We expect that foreign institutional investors promote innovation as they play an important monitoring role in facilitating corporate risk-taking. This section examines whether *FIO* impact the input and output of innovation. Specifically, as an input of innovation, we construct a R&D expenditure variable (*R&D*) that is defined as the average R&D expenses to assets ratio over a five-year overlapping period beginning from current year (Li et al. (2012)). As an output of R&D expenditure, we construct two innovation variables. In particular, *LnPatent* (*LnCitePat*) is computed as the natural logarithm of one plus the total number of patents granted (citations made to a firm's patents) in each year, scaled by the mean of patent applications filed (citations received by each patent) in that year for the same technology group.

Table 10 shows that *FIO* has a positive impact on both the input and output of firm's innovation. As shown in Column 1, *FIO* has a positive and significant impact on *R&D*. Columns 2 and 3 show that *FIO* significantly increases both *LnPatent* and *LnCitePat*. It suggests that, through monitoring managerial action, foreign institutional investors can effectively reduce managers' propensity to avoid investments in risky investments, such as R&D to retain capital for private benefits.

[Insert Table 10]

9. Robustness Test

9.1 Corporate Risk-taking around Foreign Block Purchase

To further examine the causal effect of *FIO* on corporate risk-taking, we conduct an event study in a cross-border M&A context.[12] Specifically, we focus on the changes in corporate risk-taking of target firms, where foreign ownership increases due to foreign block purchase (i.e., greater than 5%. To ensure the event windows are independent of each other, we limit our sample to firms first time to be targeted by foreign block purchase. There are 464 firms satisfy the above criteria.

Following Healy et al. (1992), we calculate the average *ROA* volatility for pre- and post-event periods up to 5 years. Specifically, for the pre-event period, we compute the average *ROA*

[12] M&A data is collected from SDC Platinum M&A Database.

volatility from year (-5 to -1), (-4 to -1), and (-3 to -1). Similarly, for the post-event period, we compute the average *ROA* volatility from year (+1 to +3), (+1 to +4), and (+1 to +5). We match each treated firm with a control firm in the same industry and country, with the closest market capitalization to that of treated firm. Panel A of Table 11 shows a significant increase in corporate risk-taking after foreign block purchase. As shown in Rows 1-3, the differences in average *ROA* volatility for treated firms and control firms are statistically insignificant, indicating that treated firms and matched firms have similar risk-taking behaviors prior to foreign block purchase. Rows 4-6 show that the differences in average *ROA* volatility between treated firms and control firms are positive and significant at 1% level, indicating that the increase in *FIO* from foreign block purchase drives firms to take higher risk. Thus, it is unlikely that the foreign institutional investors are attracted to firms with higher corporate risk-taking.

[Insert Table 11]

To address the concern that there are possible other economic motivations for taking up a foreign block position in a firm, we use nearest-neighbor-propensity-score matching approach to match the treated firms and control firms. Specifically, we estimate a logit model with dependent variable equals one if a firm is announced to be target of a foreign block purchase, and zero otherwise. In the regression, we control the one-year lag terms of firm- and country-level variables used in baseline regression, as well as year-, industry-, and country-fixed effects. After estimating the logit model, we place the same set of restrictions on the treated firms as those used previously to isolate the effect to a single foreign block purchase on the five-year pre- and post-event average *ROA* volatility. Then, each treated firm is matched based on the estimated propensity score to the nearest neighbor control firm in the same year, industry, and country. Panel B of Table 11 reports the results of propensity-score-matched sample. As a diagnostic test, we compare the differences in means of the firm-level variables used to estimate the propensity score between the treated and control firms. We find that the observable characteristics are not significantly different between treated and matched control firms, and the absolute magnitudes of these mean differences are quite small. It suggests that the predicted probability of being announced as a target of a foreign block purchase does not differ significantly across the two samples. Therefore, the treated and the control samples are similar along many observable characteristics. Consistent with the results in Panel A, the differences in average *ROA* volatility for treated firms and control firms are statistically

insignificant (positive at 1% significant level) prior to (after) foreign block purchase, suggesting that any variation in risk-taking across the two samples is likely to be attributed to foreign block purchase rather than the differences in observable characteristics.

Following our propensity-score-matched sample, we aim to distinguish the motivation and the types of foreign block purchases that leads to an increase in corporate risk-taking. By matching on the propensity score we have assured that the treated and control firms are similar on a range of conventional variables that explain corporate risk-taking. The increase in corporate risk-taking should then be explained by the foreign block purchase rather than the individual covariates. Next, we follow conventional event studies around the foreign block purchase and consider the risk-taking of the control firm as the expected risk-taking of the treated firm. To obtain the "abnormal" risk-taking of treated firm, we compute the difference between the actual risk-taking of treated firms and the expected risk-taking of control firms.

We use the following multivariate regression framework in examining the impact of foreign block purchase on corporate risk-taking,

$$\Delta Risk\_taking_{i,t} = \alpha + \beta_1 BP_{i,t-1} + \beta_2 \Delta CG \quad + \beta_3 CONTROLS_{i,t-1} + \varepsilon,$$

where $\Delta Risk\_taking$ is the difference in *RISK1* between treated firms and control firms. *BP* captures the percentage acquired by foreign block purchase. ΔCG is the difference in country-level corporate governance indices between the acquirer and target firms. *CONTROLS* includes various deal characteristics and variables indicating the differences between country-level variables of which acquirer and target firms are located.

Table 12 presents the results of the event study in a multivariate regression framework. As shown in Column 1, *BP* is positively related to $\Delta Risk\_taking$, indicating…….. In Columns 2-4, we control $\Delta ACCSTD$ and $\Delta ANTID$ which represent the differences in country-level accounting transparency and shareholder protection between the acquirer and target firms. Then results show that they are both positive and statistically significant. We find that the larger the difference in country-level accounting disclosure and/or shareholder protection between the acquirer and target firms, the more the foreign block purchase contributes to the abnormal risk-taking of target firms. This suggests that the governance motivations behind foreign block purchases is an important

factor in encouraging abnormal risk-taking in target firms.

[Insert Table 12]

9.2 Non-U.S. Firms and Additional Control Variables

Similar to other international studies, the U.S. firms dominates the sample. In particular, there are 31,928 firm-year observations are from the U.S., which are corresponding to 27.59 percent of sample. As a robustness check, we examine the subsample that excludes U.S. firms. Columns 1 and 2 of Table 13 show that the results are similar to the baseline regression in both non-U.S. and U.S. subsamples, respectively. Thus, our findings are not driven by the dominate U.S. firms.

[Insert Table 13]

We also perform a robustness check by including two additional control variables measuring the additional appeal of a firm to foreign institutional investors, including *ADR* (i.e., a dummy variable equals one if a firm is an American Depository Receipt, and zero otherwise) and *MSCI*. As shown in Column 3 of Table 13, the results remain qualitatively unchanged. It suggests that *FIO* has a real effect on corporate risk-taking that is unaffected by the firms' appeal to foreign institutional investors.

10. Conclusion

Employing a large sample of 17,698 firms across 42 countries, we examine the impact of *FIO* on corporate risk-taking. Motivating corporate risk-taking is pivotal because corporate risk-taking is essential to corporate growth and economic growth (John et al. (2008)). With the globalization of the world economy, foreign institutional investors are playing increasingly important roles in the world economy. As a result, it is necessary to examine the impact of *FIO* on corporate risk-taking. In our research, we have made the following main discoveries.

First, we show that *FIO* significantly increases corporate risk-taking, indicating that foreign institutional investors monitor the managers more intensely due to their lack of extensive existing business ties with the managers of the invested firms.

Second, we examine whether *FIO* and country-level corporate governance are substitutes or complements in determining corporate risk-taking. We find that the positive relation between *FIO* and corporate risk-taking is more prominent in countries with poorer governance institutions. It supports the view that foreign institutional investors play stronger roles in motivating managers to take risk in countries with weaker corporate governance. Therefore, our evidence shows that *FIO* and country-level corporate governance are substitutes. We further investigate this by studying the effect of independent and long-term *FIO* on corporate risk-taking separately. We find that foreign institutional investors who are independent or long-term tends to have a stronger influence on corporate risk-taking, which provides further evidence that the positive effect of *FIO* on risk-taking is largely driven by institutions, who actively engage in monitoring.

Third, we look at a possible motivation for foreign institutional investors to drive up corporate risk-taking. We find that foreign institutional investors with internationally diversified are incentivized to influence risk-taking. Their increased tolerance to firm-specific risk allows them to be effective in monitors of corporate management. This effect however, is not shared by domestic institutional investors due to the unique characteristics of foreign institutional investors.

Fourth, we show that *FIO* has a positive effect on firm innovation (i.e. R&D, patent count, and patent citations). We expect that if foreign institutional investors can motivate corporate risk-taking, then they will reduce the incentive of managers to avoid investment in risky and costly innovative projects, this should increase the innovative capacity of the invested firm. This suggests that *FIO* has a long-term impact that induces managers to invest in long-term, value-enhancing innovative projects.

Our findings are robust to alternative variables and approaches to address endogeneity issue, including the use of alternative corporate risk-taking variables, regressions with first-differenced variables, and 2SLS regressions.

These findings have broad implications for academia, practitioners, and policy makers. For example, policy makers should carefully consider the costs and benefits related to foreign investments, when they consider to reduce the barriers to foreign investments in the hope of developing their local markets. Based on our findings, foreign investors from good corporate

governance are particularly effective at motivating corporate risk-taking in countries with poor corporate governance, but not the other way around. It provides a new channel through which foreign investments can promote economic growth in developing countries.

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Table 1. Sample Distribution

This table reports the sample distribution by country (Panel A), year (Panel B), and industry (Panel C), respectively.

Panel A: Distribution by Country

Market	N.O. of Firm-year Obs. [1]	N.O. of Firms [2]
Argentina	154	30
Australia	4,263	749
Belgium	646	94
Brazil	496	88
Canada	5,185	893
Chile	524	74
China	5,985	1,594
Croatia	170	42
Denmark	160	57
Egypt	259	42
Finland	406	92
France	1,557	387
Germany	930	349
Greece	140	49
Hong Kong	4,936	694
India	4,333	778
Indonesia	1,110	160
Ireland	220	44
Israel	1,261	224
Italy	1,536	202
Japan	25,956	3,120
Malaysia	2,705	462
Mexico	600	77
Netherlands	1,043	129
New Zealand	494	66
Norway	734	136
Pakistan	416	103
Peru	139	22
Philippines	444	57
Poland	380	103
Russia	471	93
Singapore	2,167	323
South Africa	1,439	202
Spain	196	72
Sri Lanka	105	21
Sweden	899	188
Switzerland	1,558	180
Thailand	1,568	217
Ukraine	65	20
United Kingdom	7,856	1,144
United States	31,928	4,216
Vietnam	292	105
Total	115,726	17,698

Panel B: Distribution by Year	
Year	N.O. of Firm-year Obs. [1]
2000	7,883
2001	8,899
2002	9,028
2003	8,846
2004	9,281
2005	9,430
2006	9,747
2007	10,394
2008	10,750
2009	10,627
2010	10,762
2011	10,079
Total	115,726

Panel C: Distribution by Industry		
Industry	N.O. of Firm-year Obs. [1]	N.O. of Firms [2]
Basic Materials	12,258	2,043
Consumer Goods	18,862	2,835
Consumer Services	18,161	2,638
Health Care	9,581	1,538
Industrials	34,110	5,013
Oil & Gas	6,035	986
Technology	15,014	2,389
Telecommunications	1,705	256
Total	115,726	17,698

Table 2. Summary Statistics

This table reports the summary statistics of corporate risk-taking variables, foreign and domestic institutional ownership variables, and firm- and country-level control variables. Variable definitions are provided in the Appendix A.

	N.O. of Obs.	Mean	Std. Dev.	25th	Median	75th
	[1]	[2]	[3]	[4]	[5]	[6]
Corporate Risk-taking						
RISK1	115,726	0.067	0.082	0.017	0.035	0.081
RISK2	115,726	0.165	0.201	0.042	0.087	0.198
RISK3	115,726	0.067	0.080	0.019	0.036	0.079
RISK4	115,726	0.068	0.078	0.021	0.039	0.081
SRVOL	111,148	0.068	0.036	0.043	0.059	0.083
Institutional Ownership						
FIO	115,726	0.041	0.070	0.001	0.012	0.049
DIO	115,726	0.174	0.274	0.002	0.035	0.206
Control Variables						
ROA	115,726	0.020	0.045	0.163	-0.800	0.348
LEVERAGE	115,726	0.205	0.170	0.190	0.000	0.812
SIZE	115,726	12.363	12.424	2.141	5.561	17.249
SALESGROWTH	115,726	0.215	0.105	0.632	-0.664	4.573
CAPEX	115,726	0.054	0.034	0.061	0.000	0.339
GDPGROWTH	404	3.68	3.363	1.81	3.67	5.52
ECONFREEDOM	404	7.25	0.837	6.55	7.27	7.91
GDP	404	9.17	1.407	7.96	9.27	10.46
IR	404	4.88	7.931	1.45	3.49	5.72
Country-level Corporate Governance Variables						
FINTRA	34	0.303	0.757	-0.122	0.371	0.801
ANALYST	34	15.190	7.949	8.870	14.885	20.600
ACCSTD	32	64.063	12.213	60.500	64.500	72.500
OTSCO	42	0.835	0.769	0.470	0.965	1.430
DISREQ	36	0.657	0.198	0.500	0.667	0.833
LIASTA	36	0.516	0.250	0.330	0.524	0.660
LEGCOM	36	0.417	0.500	0.000	0.000	1.000
ANTID	36	3.250	1.381	2.000	3.000	4.00
CGI	42	62.276	23.796	38.400	64.450	84.400
COC	42	0.778	1.107	-0.271	0.781	1.896

Table 3. Institutional Ownership and Corporate Risk-taking

This table reports the OLS estimation of the following model:

$$Risk\_taking_{i,t} = \alpha + \beta_1 FIO_{i,t} + \beta_2 DIO_{i,t} + \beta_3 CONTROLS_{i,t} + \varepsilon.$$

Risk_taking is the corporate risk-taking variable. *FIO* (*DIO*) is the percentage of foreign (domestic) institutional ownership of a firm. *CONTROLS* denotes a set of control variables, including *ROA, LEVERAGE, SIZE, SALESGROWTH, CAPEX, GDPGROWTH, ECONFREEDOM, GDP,* and *IR*. Beneath each coefficient estimate is the p-value in parentheses based on robust standard errors clustered at country level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Variable definitions are provided in the Appendix A.

Corporate risk-taking	*RISK1*	*RISK2*	*RISK3*	*RISK4*	*SRVOL*
	[1]	[2]	[3]	[4]	[5]
FIO	0.053***	0.130***	0.049***	0.053***	0.021***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
DIO	-0.025***	-0.063***	-0.024***	-0.027***	-0.023***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ROA	-0.185***	-0.448***	-0.180***	-0.167***	-0.058***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
LEVERAGE	0.007***	0.018***	0.007***	0.008***	0.025***
	(0.002)	(0.001)	(0.001)	(0.000)	(0.000)
SIZE	-0.009***	-0.021***	-0.009***	-0.008***	-0.005***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
SALESGROWTH	0.008***	0.019***	0.008***	0.007***	0.003***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CAPEX	0.008	0.020	0.005	0.000	-0.004*
	(0.153)	(0.177)	(0.348)	(0.964)	(0.080)
GDPGROWTH	0.000***	0.001***	0.000***	0.000***	0.000***
	(0.002)	(0.003)	(0.003)	(0.008)	(0.000)
ECONFREEDOM	0.003*	0.007	0.005**	0.004***	0.011***
	(0.073)	(0.112)	(0.010)	(0.009)	(0.000)
GDP	0.002	0.004	-0.006	-0.008*	-0.026***
	(0.738)	(0.713)	(0.199)	(0.082)	(0.000)
IR	0.000***	0.001***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.003)
Year-fixed effect	Yes	Yes	Yes	Yes	Yes
Industry-fixed effect	Yes	Yes	Yes	Yes	Yes
Country-fixed effect	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.424	0.421	0.431	0.437	0.497
N	115,726	115,726	115,726	115,726	111,148

Table 4. Foreign Institutional Ownership and Country-level Corporate Governance: Complements or Substitutes?

This table reports the OLS estimation of the following model:

$$Risk\_taking_{i,t} = \alpha + \beta_1 FIO_{i,t} + \beta_2 FIO_{i,t} \times CG + \beta_3 DIO_{i,t} + \beta_4 DIO_{i,t} \times CG + \beta_5 GC + \beta_6 CONTROLS_{i,t} + \varepsilon.$$

Risk_ taking is the corporate risk-taking variable (*RISK1*). The results are qualitatively similar by using alternative risk-raking variables. *FIO* (*DIO*) is the percentage of foreign (domestic) institutional ownership of a firm. *CG* denotes country-level corporate-governance variable. *CONTROLS* denotes a set of control variables, including *ROA, LEVERAGE, SIZE, SALESGROWTH, CAPEX, GDPGROWTH, ECONFREEDOM, GDP,* and *IR*. Beneath each coefficient estimate is the p-value in parentheses based on robust standard errors clustered at country level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Variable definitions are provided in the Appendix A.

CG =	*FINTRA*	*ANALYST*	*ACCSTD*	*OTSCO*	*DISREQ*	*LIASTA*	*LEGCOM*	*ANTID*	*CGI*	*COC*
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
FIO	0.096***	0.135***	0.262**	0.116***	0.209***	0.151***	0.108***	0.140***	0.170***	0.107***
	(0.000)	(0.000)	(0.040)	(0.000)	(0.005)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
FIO×CG	-0.034***	-0.003***	-0.003	-0.035***	-0.173**	-0.113***	-0.074***	-0.017*	-0.001**	-0.029***
	(0.003)	(0.003)	(0.114)	(0.002)	(0.038)	(0.008)	(0.000)	(0.067)	(0.040)	(0.007)
DIO	0.024	0.028	0.222	-0.033	0.020	0.040	0.031	0.001	-0.083	0.008
	(0.427)	(0.496)	(0.194)	(0.296)	(0.767)	(0.268)	(0.197)	(0.979)	(0.128)	(0.733)
DIO×CG	-0.014	-0.001	-0.003	0.020	-0.005	-0.028	-0.030	0.004	0.001*	0.009
	(0.485)	(0.537)	(0.244)	(0.170)	(0.943)	(0.425)	(0.184)	(0.667)	(0.072)	(0.613)
CG	0.021**	0.001**	0.001**	0.019**	0.030	0.026	0.030***	0.003	0.000*	0.010
	(0.039)	(0.022)	(0.030)	(0.010)	(0.350)	(0.186)	(0.001)	(0.428)	(0.095)	(0.238)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-fixed effect	No	No	No	No	No	No	No	No	No	No
Adj. R^2	0.413	0.414	0.411	0.405	0.407	0.407	0.415	0.406	0.401	0.400
N	106,994	106,253	106,512	115,726	108,363	108,363	108,363	108,363	115,726	115,726

Table 5. Institutional Ownership and Corporate Risk-taking: Developing v.s. Developed Investee Country

This table reports the OLS estimation of the following model:

$$Risk\_taking_{i,t} = \alpha + \beta_1 FIO_{Developed,i,t} + \beta_2 FIO_{Developing,i,t} + \beta_3 DIO_{i,t} + \beta_4 CONTROLS_{i,t} + \varepsilon.$$

Risk_taking is the corporate risk-taking variable (*RISK1*). The results are qualitatively similar by using alternative risk-raking variables. *FIO* (*DIO*) is the percentage of foreign (domestic) institutional ownership of a firm. *CONTROLS* denotes a set of control variables, including *ROA, LEVERAGE, SIZE, SALESGROWTH, CAPEX, GDPGROWTH, ECONFREEDOM, GDP,* and *IR*. Beneath each coefficient estimate is the p-value in parentheses based on robust standard errors clustered at country level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Variable definitions are provided in the Appendix A.

	Developing Investee Countries	*Developed Investee Countries*
	[1]	[2]
$FIO_{Developed}$	0.057***	0.051***
	(0.000)	(0.000)
$FIO_{Developing}$	0.101	0.034
	(0.557)	(0.614)
DIO	-0.039***	-0.023***
	(0.000)	(0.000)
Control variables	Yes	Yes
Year-fixed effect	Yes	Yes
Industry-fixed effect	Yes	Yes
Country-fixed effect	Yes	Yes
Adj. R^2	0.164	0.439
N	23,212	92,514

Table 6. Institutional Ownership and Corporate Risk-taking: Endogeneity Tests

This table reports the results of regression-based approaches which attempt to address the endogeneity issues. Dependent variable is the corporate risk-taking variable (*RISK1*). The results are qualitatively similar by using alternative risk-raking variables. *FIO* (*DIO*) is the percentage of foreign (domestic) institutional ownership of a firm. *CONTROLS* denotes a set of control variables, including *ROA, LEVERAGE, SIZE, SALESGROWTH, CAPEX, GDPGROWTH, ECONFREEDOM, GDP,* and *IR*. Beneath each coefficient estimate is the p-value in parentheses based on robust standard errors clustered at country level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Variable definitions are provided in the Appendix A.

	Subsample (2000, 2005, 2010)	*One-year Difference*	*Five-year Difference*	*Firm-fixed Effect*	*2SLS (MSCI)*	*2SLS (Distance)*
	[1]	[2]	[3]	[4]	[5]	[6]
FIO	0.057***	0.013***	0.033***	0.035***	0.167***	0.128***
	(0.000)	(0.006)	(0.003)	(0.000)	(0.001)	(0.000)
DIO	-0.026***	0.000	-0.007**	-0.006***	-0.024***	-0.021***
	(0.000)	(0.972)	(0.026)	(0.000)	(0.000)	(0.000)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Year-fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Industry-fixed effect	Yes	No	No	No	Yes	Yes
Country-fixed effect	Yes	No	No	No	Yes	Yes
Firm-fixed effect	No	No	No	Yes	No	No
Adj. R^2	0.402	0.049	0.093	0.745	0.417	0.406
N	28,075	96,025	42,303	115,726	115,726	98,522
Under-identification test (H0: under-identified)						
(A) Kleibergen-Paap rk LM statistic					10.436	14.970
P-value					0.001	0.000
Weak instruments (H0: Instruments are weak)						
(B) First-stage F statistic (FIO)					71.643	26.500
P-value					0.000	0.000
(C) Kleibergen-Paap Wald rk F statistic					71.643	26.500
10% critical value					16.380	16.380

Table 7. Stock Additions (Deletions) to (from) the MSCI Index

This table reports the diagnostic tests (in Panel A) and multivariate regression results (in Panel B) on the impact of the exogenous variations in *FIO* due to stock addition (deletion) to (from) the MSCI index on corporate risk-taking. Treated firms are those firms experience a stock addition (deletion) to (from) the MSCI index. Each treated firm is matched to one control firm in the same year and country by using the nearest-neighbor-propensity-score matching approach. Beneath each coefficient estimate is the p-value in parentheses based on robust standard errors clustered at country level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Variable definitions are provided in the Appendix A.

Panel A: Difference in Variables

Stock Additions to the MSCI Index

	Treated Firms (N=244)	*Control Firms (N=244)*	*Difference in Means*	
	Mean [1]	*Mean* [2]	*Difference [1]-[2]* [3]	*T-statistic* [4]
FIO	0.044	0.044	-0.001	-0.166
DIO	0.292	0.290	0.002	0.058
ROA	0.051	0.038	0.013	1.549
LEVERAGE	0.251	0.260	-0.009	-0.574
SIZE	13.541	13.472	0.070	0.493
SALESGROWTH	0.178	0.176	0.002	0.045
CAPEX	0.060	0.061	-0.001	-0.224
$Growth_{RISK1}$	0.149	0.083	0.066	1.084

Stock Deletions from the MSCI Index

	Treated Firms (N=99)	*Control Firms (N=99)*	*Difference in Means*	
	Mean [1]	*Mean* [2]	*Difference [1]-[2]* [3]	*T-statistic* [4]
FIO	0.100	0.092	0.008	0.580
DIO	0.109	0.113	-0.004	-0.126
ROA	0.059	0.060	-0.001	-0.107
LEVERAGE	0.198	0.210	-0.012	-0.471
SIZE	14.067	14.187	-0.119	-0.708
SALESGROWTH	0.137	0.155	-0.017	-0.529
CAPEX	0.042	0.045	-0.003	-0.453
$Growth_{RISK1}$	0.211	0.223	-0.013	-0.114

Table 7 Cont.

Panel B: Multivariate Tests				
Stock Additions to the MSCI Index				
	FIO	*FIO*	*RISK1*	*RISK1*
	[1]	[2]	[3]	[4]
TREAT×POST	0.053***	0.045***	0.008***	0.015***
	(0.000)	(0.000)	(0.000)	(0.000)
DIO		-0.001		-0.001
		(0.962)		(0.842)
Control variable	No	Yes	No	Yes
Year-fixed effect	Yes	Yes	Yes	Yes
Firm-fixed effect	Yes	Yes	Yes	Yes
Adj. R^2	0.868	0.871	0.613	0.653
N	2,300	2,300	2,300	2,300
Stock Deletions from the MSCI Index				
	FIO	*FIO*	*RISK1*	*RISK1*
	[1]	[2]	[3]	[4]
TREAT×POST	-0.028**	-0.023*	-0.011*	-0.011***
	(0.024)	(0.056)	(0.088)	(0.007)
DIO		-0.160***		-0.056***
		(0.001)		(0.006)
Control variable	No	Yes	No	Yes
Year-fixed effect	Yes	Yes	Yes	Yes
Firm-fixed effect	Yes	Yes	Yes	Yes
Adj. R^2	0.880	0.885	0.591	0.650
N	920	920	920	920

Table 8. Institutional Ownership and Corporate Risk-taking: Monitoring

This table reports the OLS estimation of the following model:

$$Risk\_taking_{i,t} = \alpha + \beta_1 FIO_{Type,i,t} + \beta_2 FIO_{Excluding\ Type,i,t} + \beta_3 DIO_{i,t} + \beta_4 CONTROLS_{i,t} + \varepsilon.$$

Risk_taking is the corporate risk-taking variable (*RISK1*). The results are qualitatively similar by using alternative risk-raking variables. *FIO* (*DIO*) is the percentage of foreign (domestic) institutional ownership of a firm. *CG* denotes country-level corporate-governance variable. *CONTROLS* denotes a set of control variables, including *ROA, LEVERAGE, SIZE, SALESGROWTH, CAPEX, GDPGROWTH, ECONFREEDOM, GDP,* and *IR*. Beneath each coefficient estimate is the p-value in parentheses based on robust standard errors clustered at country level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Variable definitions are provided in the Appendix A.

Type =	*Banks*	*Insurance Companies*	*Mutual Funds*	*Investment Advisors*	*Pension Funds & Endowments*	*Hedge Funds & Venture Capital*	*Independent*	*Long-term*
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
FIO_{Type}	-0.114	-0.029	0.036*	0.054***	0.118	0.063*	0.050***	0.053***
	(0.733)	(0.939)	(0.094)	(0.000)	(0.249)	(0.071)	(0.000)	(0.000)
$FIO_{Excluding\ Type}$	0.053***	0.053***	0.057***	0.051***	0.050***	0.052***	0.115	0.041*
	(0.000)	(0.000)	(0.000)	(0.009)	(0.000)	(0.000)	(0.250)	(0.078)
DIO	-0.025***	-0.025***	-0.025***	-0.025***	-0.025***	-0.025***	-0.025***	-0.025***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.424	0.424	0.424	0.424	0.424	0.424	0.424	0.424
N	115,726	115,726	115,726	115,726	115,726	115,726	115,726	115,726

Table 9. Institutional Ownership and Corporate Risk-taking: International Diversification
This table reports the OLS estimation of the following model:

$$Risk\_taking_{i,t} = \alpha + \beta_1 FIO_{High\_ID,i,t} + \beta_2 FIO_{Low\_ID,i,t} + \beta_3 DIO_{i,t} + \beta_4 CONTROLS_{i,t} + \varepsilon.$$

Risk_taking is the corporate risk-taking variable (*RISK1*). The results are qualitatively similar by using alternative risk-raking variables. *FIO* (*DIO*) is the percentage of foreign (domestic) institutional ownership of a firm. *CG* denotes country-level corporate-governance variable. *CONTROLS* denotes a set of control variables, including *ROA, LEVERAGE, SIZE, SALESGROWTH, CAPEX, GDPGROWTH, ECONFREEDOM, GDP,* and *IR*. Beneath each coefficient estimate is the p-value in parentheses based on robust standard errors clustered at country level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Variable definitions are provided in the Appendix A.

International Diversification (ID) =	*International Diversification Index (IDI)*	*Country Count (CC)*	*Foreign Portfolio Ratio (FPR)*	*Weighted IDI*
	[1]	[2]	[3]	[4]
FIO_{High_ID}	0.056***	0.055***	0.057***	
	(0.000)	(0.000)	(0.000)	
FIO_{Low_ID}	0.024	0.017	0.020	
	(0.603)	(0.773)	(0.560)	
FIO				0.011
				(0.104)
IDI_{FIO}				0.000
				(0.975)
$FIO \times IDI_{FIO}$				0.044***
				(0.008)
DIO	-0.025***	-0.025***	-0.025***	-0.024***
	(0.000)	(0.000)	(0.000)	(0.000)
$DIO \times IDI_{DIO}$				0.008
				(0.619)
IDI_{DIO}				0.003
				(0.657)
Control variables	Yes	Yes	Yes	Yes
Year-fixed effect	Yes	Yes	Yes	Yes
Industry-fixed effect	Yes	Yes	Yes	Yes
Country-fixed effect	Yes	Yes	Yes	Yes
Adj. R^2	0.424	0.424	0.424	0.410
N	115,726	115,726	115,726	78,649

Table 10. Institutional Ownership and Innovation

This table reports the OLS estimation of the following model:

$$Innovation_{i,t} = \alpha + \beta_1 FIO_{i,t} + \beta_2 DIO_{i,t} + \beta_3 CONTROLS_{i,t} + \varepsilon.$$

Innovation variables includes *R&D, LnPatent,* and *LnCitePat*. *FIO* (*DIO*) is the percentage of foreign (domestic) institutional ownership of a firm. *CG* denotes country-level corporate-governance variable. *CONTROLS* denotes a set of control variables, including *ROA, LEVERAGE, SIZE, SALESGROWTH, CAPEX, GDPGROWTH, ECONFREEDOM, GDP,* and *IR*. Beneath each coefficient estimate is the p-value in parentheses based on robust standard errors clustered at country level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Variable definitions are provided in the Appendix A.

	R&D	*LnPatent*	*LnCitePat*
	[1]	[2]	[3]
FIO	0.063***	0.681***	0.949***
	(0.000)	(0.007)	(0.000)
DIO	-0.005	0.048	0.262***
	(0.343)	(0.474)	(0.000)
Control variables	Yes	Yes	Yes
Year-fixed effect	Yes	Yes	Yes
Industry-fixed effect	Yes	Yes	Yes
Country-fixed effect	Yes	Yes	Yes
Adj. R^2	0.450	0.302	0.157
N	115,726	42,582	42,582

Table 11. Corporate Risk-taking around Foreign Block Purchase

This table presents the announcement effect of corporate risk-taking around foreign block purchase (i.e., greater than 5%). We match each treated firm with a control firm by size in Panel A and by propensity score in Panel B. We compute and compare the average *ROA* volatility of treated firms and control firms. The average *ROA* volatility is reported for pre-event periods (-5 to -1), (-4 to -1), and (-3 to -1), while for post-event periods (+1 to +3), (+1 to +4), and (+1 to +5). Columns 1 and 2 report the average *ROA* volatility for treated firms and control firms, respectively. The difference and its t-statistic are reported in Columns 3 and 4. ***, **, * denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Size-matched Sample

	Treated Firms (N=464)	*Control Firms (N=464)*	*Difference in Means*	
	Average ROA Volatility	*Average ROA Volatility*	*Difference* [1]-[2]	*T-statistic*
	[1]	[2]	[3]	[4]
Year (-5 to -1)	0.098	0.091	0.007	0.703
Year (-4 to -1)	0.091	0.084	0.007	0.761
Year (-3 to -1)	0.081	0.080	0.001	0.125
Year (+1 to +3)	0.106	0.059	0.047	3.811***
Year (+1 to +4)	0.109	0.067	0.042	3.629***
Year (+1 to +5)	0.113	0.075	0.039	3.484***

Panel B: Propensity-score-matched Sample

	Treated Firms (N=270)	*Control Firms (N=270)*	*Difference in Means*	
	Mean	*Mean*	*Difference* [1]-[2]	*T-statistic*
	[1]	[2]	[3]	[4]
FIO	0.065	0.058	0.007	0.902
DIO	0.104	0.101	0.003	0.145
ROA	0.010	0.020	-0.010	-0.776
LEVERAGE	0.255	0.263	-0.008	-0.453
SIZE	12.448	12.498	-0.050	-0.274
SALESGROWTH	0.173	0.189	-0.017	-0.449
CAPEX	0.057	0.051	0.006	1.250
	Average ROA Volatility	*Average ROA Volatility*	*Difference* [1]-[2]	*T-statistic*
	[1]	[2]	[3]	[4]
Year (-5 to -1)	0.074	0.068	0.006	0.824
Year (-4 to -1)	0.068	0.062	0.007	0.902
Year (-3 to -1)	0.063	0.056	0.007	1.016
Year (+1 to +3)	0.064	0.049	0.014	2.182**
Year (+1 to +4)	0.068	0.053	0.015	2.290**
Year (+1 to +5)	0.080	0.058	0.021	2.793***

Table 12. Foreign Block Purchase and Corporate Risk-taking

This table reports the OLS estimation of the following model:

$$\Delta Risk\_taking_{i,t} = \alpha + \beta_1 BP_{i,t-1} + \beta_2 \Delta CG \quad + \beta_3 CONTROLS_{i,t-1} + \varepsilon.$$

BP is the percentage acquired by foreign block purchase. ΔCG is the difference in *ACCSTD* and *ANTID* between acquirer and target firms. *CONTROLS* denotes a set of deal characteristics, as well as the differences in country-level variables between acquirer and target firms. Beneath each coefficient estimate is the p-value in parentheses based on robust standard errors clustered at country level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Variable definitions are provided in the Appendix A.

	[1]	[2]	[3]	[4]
BP	0.105*	0.177**	0.136*	0.178**
	(0.050)	(0.020)	(0.081)	(0.020)
$\Delta ACCSTD$		0.004***		0.003**
		(0.003)		(0.010)
ANTID			0.011**	0.007*
			(0.013)	(0.099)
PREMIUM	0.000	-0.001	-0.001	-0.001
	(0.881)	(0.217)	(0.195)	(0.186)
ALL-CASH BID	0.001	-0.012	-0.006	-0.012
	(0.939)	(0.431)	(0.670)	(0.435)
FRIENDLY BID	0.016*	0.017	0.017*	0.019*
	(0.080)	(0.118)	(0.096)	(0.074)
INDUSTRY	-0.016	0.010	0.008	0.012
	(0.112)	(0.500)	(0.610)	(0.426)
CONTINENT	0.002	0.016	0.001	0.018
	(0.835)	(0.127)	(0.926)	(0.102)
LANGUAGE	-0.030**	-0.033***	-0.035*	-0.040**
	(0.016)	(0.010)	(0.063)	(0.013)
ΔGDP	-0.009**	-0.013	-0.008	-0.011
	(0.036)	(0.119)	(0.153)	(0.155)
$\Delta GDPGROWTH$	0.000	0.001	0.001	0.001
	(0.884)	(0.768)	(0.826)	(0.854)
Year-fixed effect	Yes	Yes	Yes	Yes
Industry-fixed effect	Yes	Yes	Yes	Yes
Country-fixed effect	Yes	Yes	Yes	Yes
Adj. R^2	0.336	0.397	0.391	0.402
N	253	196	205	196

Table 13. Robustness Tests

This table reports the OLS estimation of the following model:

$$Risk\_taking_{i,t} = \alpha + \beta_1 FIO_{i,t} + \beta_2 DIO_{i,t} + \beta_3 CONTROLS_{i,t} + \varepsilon.$$

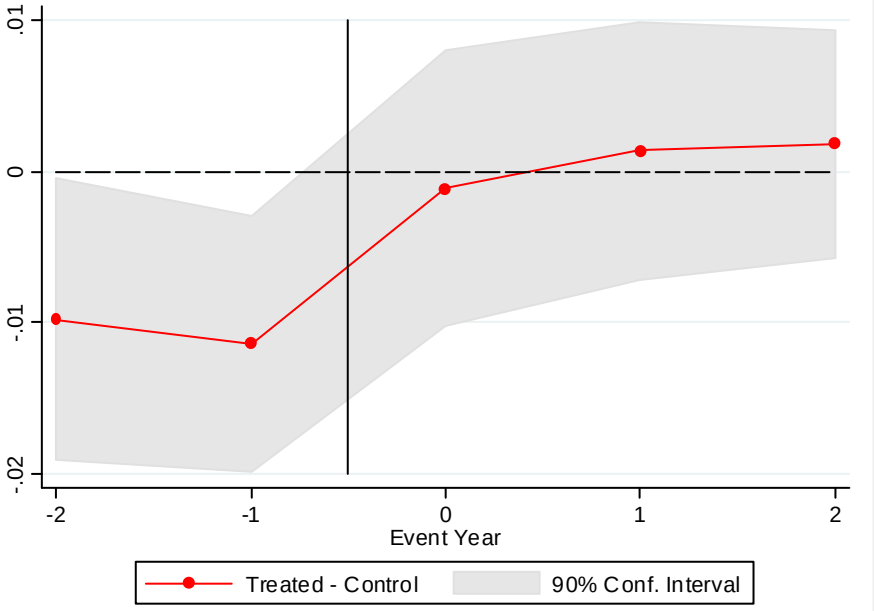
Risk_taking is the corporate risk-taking variable (*RISK1*). The results are qualitatively similar by using alternative risk-raking variables. *FIO* (*DIO*) is the percentage of foreign (domestic) institutional ownership of a firm. *CG* denotes country-level corporate-governance variable. *CONTROLS* denotes a set of control variables, including *ROA, LEVERAGE, SIZE, SALESGROWTH, CAPEX, GDPGROWTH, ECONFREEDOM, GDP,* and *IR*. Beneath each coefficient estimate is the p-value in parentheses based on robust standard errors clustered at country level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Variable definitions are provided in the Appendix A.

	Non-U.S. subsample [1]	U.S. firms [2]	Additional control variables [3]
FIO	0.047***	0.087***	0.044***
	(0.000)	(0.000)	(0.000)
DIO	-0.042***	-0.025***	-0.024***
	(0.003)	(0.000)	(0.000)
ADR			0.005**
			(0.017)
MSCI			0.006***
			(0.007)
Control variables	Yes	Yes	Yes
Year-fixed effect	Yes	Yes	Yes
Industry-fixed effect	Yes	Yes	Yes
Country-fixed effect	Yes	No	Yes
Adj. R^2	0.401	0.403	0.424
N	83,798	31,928	115,726

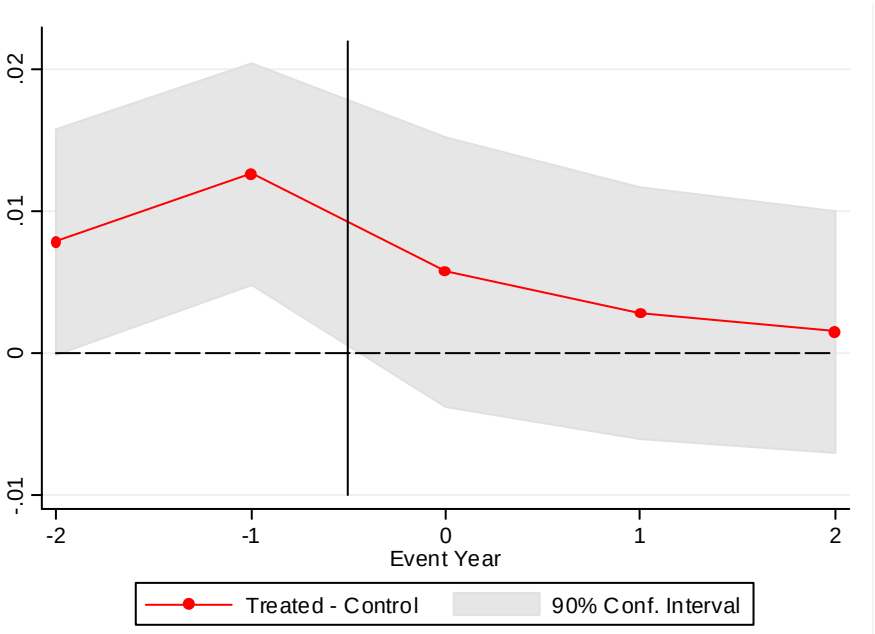
Figure 1: Corporate Risk-taking of Treated and Control Firms around Stock Additions (Deletions) to (from) the MSCI Index

This figure shows the difference in *RISK1* between treated and control firms two year before and after the stock additions (deletions) to (from) the MSCI index. The events occur between year (-1 to 0). Treated firms consist of 244 (99) stock additions (deletions) to the MSCI index.

Panel A: Stock Additions to the MSCI Index



Panel B: Stock Deletions from the MSCI Index



Appendix A: Variable Definitions

Variable	Acronym	Definition	Source
Panel A: Corporate Risk-taking			
Earnings Volatility	***RISK1***	$RISK1 = \sqrt{\frac{1}{T-1}\sum_{t=1}^{T}\left(ROA_{i,t} - \frac{1}{T}\sum_{t=1}^{T} ROA_{i,t}\right)^2}$, where $ROA_{i,t} = \frac{EBIT_{i,t}}{Assets_{i,t}}$. T is over the year (0 to +4).	Worldscope
Earnings Range	***RISK2***	$RISK2 = Max(ROA_{i,t}) - Min(ROA_{i,t})$, where $ROA_{i,t} = \frac{EBIT_{i,t}}{Assets_{i,t}}$. T is over the year (0 to +4).	Worldscope
Earnings Volatility (Adjusted by country)	***RISK3***	$RISK3 = \sqrt{\frac{1}{T-1}\sum_{t=1}^{T}\left(ROA_{i,c,t} - \frac{1}{T}\sum_{t=1}^{T} ROA_{i,c,t}\right)^2}$, where $ROA_{i,c,t} = \frac{EBIT_{i,c,t}}{Assets_{i,c,t}} - \frac{1}{N_{c,t}}\sum_{k=1}^{N_{c,t}} \frac{EBIT_{k,c,t}}{Assets_{k,c,t}}$, $N_{c,t}$ indexes the firms within country *c* and year *t*. T is over the year (0 to +4).	Worldscope
Earnings Volatility (Adjusted by country and industry)	***RISK4***	$RISK4 = \sqrt{\frac{1}{T-1}\sum_{t=1}^{T}\left(ROA_{i,c,d,t} - \frac{1}{T}\sum_{t=1}^{T} ROA_{i,c,d,t}\right)^2}$, where $ROA_{i,c,d,t} = \frac{EBIT_{i,c,d,t}}{Assets_{i,c,d,t}} - \frac{1}{N_{c,d,t}}\sum_{k=1}^{N_{c,d,t}} \frac{EBIT_{k,c,d,t}}{Assets_{k,c,d,t}}$, $N_{c,d,t}$ indexes the firms within country *c*, industry *d*, and year *t*. T is over the year (0 to +4).	Worldscope
Stock Return Volatility	***SRVOL***	The standard deviation of monthly stock returns over a two-year period (i.e., 0 to +1).	Datastream
Panel B: Institutional Ownership			
Foreign Institutional Ownership	***FIO***	The aggregate equity holdings by foreign institutions scaled by firm's market capitalization.	FactSet
Domestic Institutional Ownership	***DIO***	The aggregate equity holdings by domestic institutions scaled by firm's market capitalization.	FactSet

Foreign Institutional Ownership (Developed)	$\boldsymbol{FIO_{Developed}}$	The aggregate equity holdings by foreign institutions domiciled in developed countries scaled by firm market capitalization.	FactSet
Foreign Institutional Ownership (Developing)	$\boldsymbol{FIO_{Developing}}$	The aggregate equity holdings by foreign institutions domiciled in developing countries scaled by firm market capitalization.	FactSet
Foreign Institutional Ownership (Independent)	$\boldsymbol{FIO_{Independent}}$	The aggregate equity holdings by independent foreign institutions (i.e., investment companies, investment advisors, hedge funds, and venture capital) scaled by firm market capitalization.	FactSet
Foreign Institutional Ownership (Grey)	$\boldsymbol{FIO_{Grey}}$	The aggregate equity holdings by grey foreign institutions (i.e., banks, insurance companies, and pension funds & endowment) scaled by firm market capitalization.	FactSet
Foreign Institutional Ownership (Long-term)	$\boldsymbol{FIO_{Long-term}}$	The aggregate equity holdings by long-term foreign institutions (i.e., defined as those with average portfolio turnover below the median) scaled by firm market capitalization.	FactSet
Foreign Institutional Ownership (Short-term)	$\boldsymbol{FIO_{Short-term}}$	The aggregate equity holdings by short-term foreign institutions (i.e., defined as those with average portfolio turnover above the median) scaled by firm market capitalization.	FactSet
Foreign Institutional Ownership (Internationally Diversified)	$\boldsymbol{FIO_{High\_ID}}$	The aggregate equity holdings by internationally diversified foreign institutions (i.e., defined as those with international diversification variables, such as international diversification index, country count, foreign portfolio ratio, above annual median) scaled by firm market capitalization.	FactSet
Foreign Institutional Ownership (Internationally Under-diversified)	$\boldsymbol{FIO_{Low\_ID}}$	The aggregate equity holdings by internationally under-diversified foreign institutions (i.e., defined as those with international diversification variables, such as international diversification index, country count, foreign portfolio ratio, below annual median) scaled by firm market capitalization.	FactSet
Panel C: Control Variables			
Return on Assets	***ROA***	The ratio of earnings before interest and taxes to book value of assets.	Worldscope
Financial leverage	***LEVERAGE***	The ratio of book value of debt to book value of assets.	Worldscope
Firm Size	***SIZE***	The natural logarithm of total sales denominated in U.S. dollar.	Worldscope
Sales Growth	***SALESGROWTH***	The annual sales growth rate.	Worldscope
Capital Expenditure	***CAPEX***	The ratio of capital expenditure to book value of assets.	Worldscope

American Depository Receipts Indicator	***ADR***	Dummy variable equals one if a company has American Depository Receipts trading on a U.S. exchange, and zero otherwise.	Worldscope
GDP Growth	***GDPGROWTH***	The annual GDP growth rate, at constant 2005 U.S. dollar.	WDI
Economic Freedom Index	***ECONFREEDOM***	It measures the degree to which the policies and institutions of countries are supportive of economic freedom. The cornerstones of economic freedom are personal choice, voluntary exchange, freedom to compete, and security of privately owned property. The index is constructed by using 42 variables in five broad areas: (1) size of government, (2) legal system and property rights, (3) sound money, (4) freedom to trade internationally, and (5) regulation.	Economic Freedom of the World
GDP per Capita	***GDP***	The natural logarithm of GDP per capita, at constant 2005 U.S. dollar.	WDI
Real Interest Rates	***IR***	The real interest rates.	WDI
Panel D: Country-level Corporate Governance			
Financial Transparency	***FINTRA***	The relative measure of the availability of financial information to those outside the firm due to the disclosure, interpretation, and dissemination of financial information by firms, financial analysts, and media reporters.	Bushman et al. (2004)
Financial Analysts	***ANALYST***	The number of analysts following of the largest 30 companies in each country in 1996.	Bushman et al. (2004)
Overall Transparency Score	***OTSCO***	A score that measures both institutional and political transparency (simple average of the two subcomponents). The score has an expected value (across countries) of zero, and a standard deviation (across countries) of one.	Bellver and Kaufmann (2005)
Disclosure Requirements Index	***DISREQ***	The index of disclosure equals the arithmetic mean of: (1) prospect, (2) compensation, (3) shareholders, (4) inside ownership, (5) contracts irregular, and (6) and transactions.	La Porta et al. (2006)
Liability Standard Index	***LIASTA***	The index of liability standards equals the arithmetic mean of: (1) liability standard for the issuer and its directors, (2) liability standard for the distributor, and (3) liability standard for the accountant.	La Porta et al. (2006)
Legal Origin	***LEGCOM***	Dummy variable equals one if a country adopts common law system, and zero otherwise.	La Porta et al. (1998)
Anti-director Index	***ANTID***	An index aggregating the shareholder rights we labeled as ‘‘anti-director rights’’. The index is formed by adding 1 when (1) the country allows shareholders to mail their	La Porta et al. (1998)

		proxy vote to the firm, (2) shareholders are not required to deposit their shares prior to the general shareholders' meeting, (3) cumulative voting or proportional representation of minorities in the board of directors is allowed, (4) an oppressed minorities mechanism is in place, (5) the minimum percentage of share capital that entitles a shareholder to call for an extraordinary shareholders' meeting is less than or equals 10 percent (the sample median), or (6) shareholders have preemptive rights that can be waived only by a shareholders' vote.	
Corporate Governance Index	***CGI***	The percentage of firms in the country that give satisfactory ratings to the questions on protection of minority shareholders, quality of training, willingness to delegate authority, nepotism and corporate governance.	Kaufmann (2004)
Control of Corruption	***COC***	It captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.	Kaufmann et al. (2009)
Panel E: Instrumental Variables			
MSCI Membership	***MSCI***	Dummy variable equals one if a firm is a member of the MSCI All Country World Index, and zero otherwise.	MSCI
Weighted Bilateral Distance	***DISTANCE***	The natural logarithm of the weighted average geographic distance between investor country and investee country. To compute the weight, we divide the market value of the individual investors' portfolio by the market capitalization of the invested firm.	Mayer and Zignago (2011)
Panel F: Innovation			
Research and Development	***R&D***	The average R&D ratio (i.e., the ratio of research and development expenses to book value of assets) over the year (0 to +4).	Worldscope
Patent Count	***LnPatent***	The natural logarithm of one plus the total number of patents granted to a firm in each year, scaled by the mean of patent applications filed in that year for the same technology group.	Thomson Innovations
Patent Citations	***LnCitePat***	The natural logarithm of one plus the total number of citations made to a firm's patents in each year, scaled by the mean of citations received by each patent in that year for the same technology group.	Thomson Innovations