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

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Abstract

Employing a large sample of 17,698 firms across 42 countries spanning the years 2000 to 2015, we show that foreign institutional ownership (*FIO*) positively influences corporate risk-taking, and this positive relation is achieved through the *monitoring channel* and *international diversification channel*. In addition, *FIO* is found to be a substitute for country-level corporate governance in determining corporate risk-taking, indicating that foreign institutional investors play a significant 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.

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

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1. Introduction

A firm's performance and growth are fundamentally spurred by its risk-taking, which has been studied from various perspectives in previous literature, including country-level corporate governance (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 that examines the impact of foreign institutional ownership (*FIO*) on corporate risk-taking in an international context.[1] This paper fills this gap by providing a new set of extensive empirical evidence on this issue.

The significant growth of international capital flows brings tremendous benefits to the global economy, such as promoting the economic growth of investee countries, reducing the cost of capital via risk sharing, and enhancing the monetary capital of invested firms. Nevertheless, it also leads to some negative impacts, such as destabilizing the investees' capital markets and exposing the invested firms to international risk and even financial crises. Existing literature documents mixed empirical evidence on the impact of foreign capital flows on local firms.[2] Given that foreign capital is becoming an increasingly important source of financing around the world (Bekaert et al. (2002)),[3] it is essential to understand the impact of *FIO* on firms' decisions and performance, in particular, corporate risk-taking.

How can *FIO* influence corporate risk-taking? First, foreign institutional investors equip firms with both monetary and non-monetary capital (e.g., human capital, business relationship, managerial skills, marketing know-how, and new export market access) (Stiglitz (2000); Li et al. (2011)), which allows them to implement riskier and more-innovative projects (Boubakri et al. (2013)). For example, Bena et al. (2017) and Luong et al. (2017) find that *FIO* increases innovation output (i.e., the patents filed by invested firms), which is a likely outcome of risk-taking activities. Second, foreign institutional investors have fewer conflicts of interest with invested firms. They take a more independent and active stance in terms of corporate governance

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

[2] For example, Bae et al. (2004) find that foreign investibility (i.e., stock accessibility to foreigners) increases the stock return volatility of invested firms, while Bekaert and Harvey (1997) and Kim and Singal (2000) find insignificant results. Bekaert and Harvey (2000) show that financial liberalization reduces firms' cost of capital. Aggarwal et al. (2011) demonstrate that financial globalization improves firms' corporate governance practice, while Stulz (2005) reveals the limits of foreign shareholders due to insiders' agency problem.

[3] 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.

practice, which implies a strong monitoring role in improving the corporate governance of invested firms (Gillan and Starks (2003); Ferreira and Matos (2008); Aggarwal et al. (2011)). Meanwhile, the improved corporate governance encourages firms to take higher risk (John et al. (2008); Boubakri et al. (2013)). This view is called the *monitoring channel*. Third, foreign institutional investors tend to take advantage of their internationally diversified portfolios, in which the capital has been invested in different countries, to invest in riskier projects. Such an advantage enables them to encourage managers to take higher risk (Faccio et al. (2011)). We call this view the *international diversification channel*.

Although John et al. (2008) suggest that strong country-level corporate governance, such as better investor protection and transparent information environments, promotes corporate risk-taking, it remains unclear whether the cross-country differences in corporate governance strengthen or attenuate the relation between *FIO* and corporate risk-taking. On the one hand, strong 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 impacts on corporate risk-taking in countries with stronger corporate governance, which improves foreign institutional investors' abilities to publicly challenge or privately pressure the managers. In addition, foreign institutional investors have less of an information disadvantage in countries with stronger 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 the role of *FIO* in determining corporate risk-taking. On the other hand, the impact of *FIO* on corporate risk-taking could be attenuated by country-level corporate governance. For example, Aggarwal et al. (2011) find that the role of *FIO* in improving firm-level 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 are substitutes. This paper tries to shed new light on this controversial issue.

Employing a large sample of 17,698 firms across 42 countries spanning the years 2000 to 2015, we show that *FIO* increases corporate risk-taking. Furthermore, this positive relation is largely achieved through the *monitoring channel* and the *international diversification channel*.

The results are robust when employing non-United States (U.S.) and U.S. subsamples and when including additional control variables to capture firms' attractiveness to foreign investors (i.e., dummy variables indicating whether a firm is an American Depository Receipt (ADR) or is included in the major index of its home country). Furthermore, *FIO* is found to be a substitute for country-level corporate governance in determining corporate risk-taking. Our results also show that *FIO* from developed countries can strengthen corporate risk-taking for firms in developing countries, but not the other way around. This supports the view that foreign institutional investors play a significant role in motivating managers to take higher risk in countries with weaker corporate governance. In addition, we document that, as likely outcomes of risk-taking activities, both the innovation input and output are encouraged by *FIO*.

The endogeneity of *FIO* makes it difficult to argue its causality effect on corporate risk-taking. For example, foreign institutional investors could select and invest in firms with higher corporate risk-taking, or an unobserved factor could affect both *FIO* and corporate risk-taking. To tackle the above concerns, we adopt both regression-based and event-study approaches, which are described as follows. First, due to the nature of our risk-taking variables (i.e., the five-year forward-looking *ROA* volatility), it is possible that the autocorrelations between the consecutive years of risk-taking variables drive the results. To mitigate this concern, we further examine the baseline regression based on a subsample to ensure that there are no overlaps in risk-taking variables (i.e., only the observations in the years 2000, 2005, and 2010). Second, we take the one-year (or five-year) difference of the dependent and independent variables and then examine the baseline regression with these differenced variables. By taking the difference, we remove the unobserved time-invariant firm factors that could drive the relation between *FIO* and corporate risk-taking. Third, we employ a firm-fixed effect regression. Fourth, we employ a two-stage least squares (2SLS) approach by using the membership in the Morgan Stanley Capital International All Country World Index (MSCI ACWI) as an instrumental variable. Fifth, we conduct a quasi-natural experiment by using stock additions (deletions) to (from) the MSCI ACWI. We find that the exogenous variations in *FIO* from stock additions (deletions) to (from) the MSCI ACWI significantly increase (decrease) corporate risk-taking. Sixth, to further clarify the direction of causality in the relation between *FIO* and corporate risk-taking, we verify whether the increase in *FIO* due to cross-border mergers and acquisitions (M&As) increases corporate risk-taking. The overall empirical evidence from all the above

analyses suggests that our main findings, namely, the positive impact of *FIO* on corporate risk-taking, are valid by taking into account the endogeneity concern.

This paper contributes to the existing literature in treating the following aspects. First, it contributes to the debate on the controversial role of *FIO* in financial markets. Our paper documents a positive impact of *FIO* on local financial markets from the perspective of encouraging corporate risk-taking. It thus sheds additional light on the debate of this issue. Specifically, it shows that foreign institutional investors equip firms with greater capabilities to take riskier and more-innovative projects, complementing previous studies, including Stiglitz (2000), Li et al. (2011), Boubakri et al. (2013), Bena et al. (2017), and Luong et al. (2017). Furthermore, it finds that foreign institutional investors play a strong monitoring role in improving the corporate governance of invested firms, consistent with Gillan and Starks (2003), Ferreira and Matos (2008), and Aggarwal et al. (2011).[4] In addition, it demonstrates that foreign institutional investors tend to take advantage of their internationally diversified portfolios (in which the capital has been invested in different countries) to invest in riskier projects. It supports Faccio et al. (2011), which argue that such an advantage enables them to encourage managers to take higher risk.

The study that most resembles our paper is Boubakri et al. (2013), which shows 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 the privatization process and argue that the latter is more risk oriented than the former. Our paper focuses on the role of *FIO* in shaping corporate risk-taking, and it hypothesizes that *FIO* increases corporate risk-taking through the *monitoring channel* and the *international diversification channel*. We not only significantly expand their sample beyond the 381 newly privatized firms, but we also find results that are arguably more informative and

[4] Existing literature suggests that foreign institutional investors could improve the corporate governance of invested firms and, in particular, could enhance the financial information quality upon their privatization (Dyck (2001); Boubakri et al. (2007)) and could reduce the agency costs by promoting the appointments of big-four auditors (Guedhami et al. (2009)). Other evidence of the governance role of foreign institutional investors comes from the perspectives of capital market liberalization (Stulz (1999)), cross listing (Doidge (2004); Doidge et al. (2009)), cross-border M&As (Rossi and Volpin (2004), Bris and Cabolis (2008), and Ferreira et al. (2010)), and delisting in high-disclosure countries (Marosi and Massousd (2008)). Our paper shows that *FIO* plays a strong monitoring role and encourages corporate risk-taking, supporting Aggarwal et al. (2011), which identify the major channels through which *FIO* enhances the value of invested firms, including a more independent board, a lowered likelihood of CEO duality and staggered board, and the termination of poorly performing CEOs.

generally based on a much larger sample, including both post-privatized and public firms. Therefore, the contexts and stages of foreign ownership are different in these two papers, with the different results not necessarily contradicting each other.[5]

Second, this paper contributes to the literature on the firm-level determinants of corporate risk-taking. In particular, recent literature examines the impact of large shareholder diversification (Faccio et al. (2011)) and ownership structure via privatization (Boubakri et al. (2013)) on corporate risk-taking. Previous literature also examines the impact of ownership concentration on corporate risk-taking. For example, Anderson and Reeb (2003) document that the ownership of founder families (which are assumed to be large and undiversified blockholders) is associated with higher operating risk. Paligorova (2010) find a positive relation between the ownership of the largest shareholder and corporate risk taking, while John et al. (2008) find an insignificant relation between ownership concentration and corporate risk-taking. This paper suggests that corporate risk-taking is also influenced by the level of *FIO*, thus complementing existing literature.

Third, this paper contributes to the literature on the role of country-level institutional determinates in influencing corporate risk-taking. For example, John et al. (2008) find that better investor protection encourages firms to take riskier but value-enhancing investments. Acharya et al. (2011) suggest that stronger creditor rights in bankruptcy discourage corporate risk-taking. Li et al. (2013) find that national culture, namely, individualism (uncertainty avoidance and harmony), positively (negatively) impact(s) corporate risk-taking. However, there is no consensus on the controversial joint role of country-level corporate governance and *FIO* in determining corporate risk-taking. For example, Li et al. (2011) find that the *stabilizing role* of large foreign investors (i.e., reducing firms' stock return volatility) is stronger in countries with stronger corporate governance. Conversely, Aggarwal et al. (2011) suggest that *FIO* improves firm-level corporate governance and that this impact is more pronounced for firms located in countries with weaker shareholder protection. Our paper documents that country-level corporate governance and *FIO* are substitutes in determining corporate risk-taking, thus shedding additional light not only on the role of country-level corporate governance but also on its controversial joint role with *FIO*.

[5] Boubakri et al. (2013) find that *FIO* and country-level corporate governance are complementary in determining corporate risk-taking, while we find that they are substitutes.

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

2. Hypotheses Development

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 for academia and industry practitioners. However, the agency conflicts resulting form the separation of ownership and control affect firms' risk-taking decisions. For example, due to career and reputation concerns, managers could avoid risky projects even when they enhance firm value (Amihud and Lev (1981); Myers and Majluf (1984); Holmstrom and Ricart I Costa (1986); Hirshleifer and Thakor (1992)). Existing research focuses on aligning the interests of managers with shareholders by using various macroeconomic 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 *FIO* affects corporate risk-taking around the world. First, foreign institutional investors equip firms with greater capabilities to take higher risk. Specifically, they bring not only monetary capital but also non-monetary benefits, such as human capital, business relationships, managerial skills, marketing know-how, and new export market access (Stiglitz (2000); Li et al. (2011)). 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. Bena et al. (2017) and Luong et al. (2017) suggest that a higher *FIO* is associated with a significantly higher innovation output (i.e., patents filed by the invested firms). In addition, foreign institutional investors could broaden firms' investor base, which creates a risk-sharing effect that further increases the risk-taking potential of invested firms (Merton (1987)).

Second, foreign institutional investors play a strong monitoring role, as they have fewer conflicts of interests with invested firms. In particular, foreign institutional investors take a more independent and active stance in terms of corporate governance practice, while domestic institutional investors have loyalty concerns with 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 they improve the corporate governance of invested firms (Doidge et al. (2004); Stulz (2005)). Aggarwal et al. (2011) document that *FIO* increases the proportion of independent directors and prevents the invested firms from adopting staggered boards. Fang et al. (2015) suggest that U.S. foreign institutional ownership positively impacts the global convergence of financial reporting practices. John et al. (2008) and Boubakri et al. (2013) suggest that the improved corporate governance encourages firms to take higher risk and results in better 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. This view is called the *monitoring channel*.

Third, the investment portfolios of foreign institutional investors are more internationally diversified; the capital has been invested in different countries. Thus, they tend to encourage managers to take higher risk (Faccio et al. (2011)). This view is called the *international diversification channel*. In sum, 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 strong country-level corporate governance, such as better investor protection and transparent information environments, promotes corporate risk-taking (John et al. (2008)). However, the controversial joint role of country-level corporate governance and *FIO* in determining corporate risk-taking remains unclear.

On the one hand, Li et al. (2011) find that large foreign investors have greater reduction impacts on firms' stock return volatility in countries 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 better corporate governance, where investors are well protected and information is more creditable. This implies that

country-level corporate governance strengthens 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 corporate governance practices *travel around the world* through foreign institutional investors. In particular, *FIO* from countries with stronger corporate governance brings substantial improvements in firm-level corporate governance of invested firms in countries with weaker corporate governance. Rossi and Volpin (2004) find that acquirers are typically from countries with stronger investor protection than that of their targets' countries in cross-border M&As, suggesting that foreign acquisitions play a governance role by improving the investor protection of target firms. Bris and Cabolis (2008) find that the acquisition premiums are higher in cross-border M&As where the acquirers are from countries with stronger country-level corporate governance. 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 weaker corporate governance. Conversely, in countries with stronger 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 a strong impact on corporate risk-taking. The above analysis implies that *FIO* and country-level corporate governance environments 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

details 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 the 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 previous 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*), the economic freedom index (*ECONFREEDOM*), GDP per capita (*GDP*), and market interest rates (*IR*).[6] 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 the 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 whether *FIO* and country-level corporate governance are complements or substitutes in determining corporate risk-taking, we estimate the following model,

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

where *CG* denotes a particular country-level corporate governance variable (see details 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

[6] Variable definitions are provided in Appendix A.

volatility (*RISK3*); and (3) the country-industry-adjusted earnings volatility (*RISK4*). In addition, we employ a risk-taking variable (*SRVOL*) at the 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, the Financial Transparency Index (*FINTRA*) measures the availability of financial information to those outside the firm, and the Financial Analysts Index (*ANALYST*) is the number of analysts following the largest 30 companies of each country. The Overall Transparency Score (*OTSCO*) measures the institutional and political transparency. In addition, the Disclosure Requirements Index (*DISREQ*) measures the degree of disclosure requirements, and the 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 focuses on the legal origin, shareholder protection, and control of corruption in each country. In particular, *LEGCOM* is a dummy variable equal to one if a country adopts a common law system (which provides better shareholder protection than a civil law system), and zero otherwise, and *ANTID* measures the level of shareholder protection of each country. Furthermore, the Corporate Governance Index (*CGI*) measures the percentage of firms in the country that satisfy the following: protection of minority shareholders, quality training, willingness to delegate authority, discouragement of 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 returns, and country-level control variables are collected from Worldscope, Datastream, and World Development Indicators (WDI), respectively. Foreign and domestic institutional ownership data are collected from the 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 the 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.[7]

Table 1 reports the sample distribution by country, year, and industry. As shown in Panel A, the sample coverage is better for developed countries than for developing countries. In particular, the U.S. contributes most firm-year observations to the sample (i.e., 31,928 firm-year observations, or 27.59% of the sample). In the robustness test, we examine the subsample that excludes U.S. firms; the results are qualitatively unchanged. Panel B shows that more firm-year observations are available in 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 those of Boubakri et al. (2013), as their sample only covers 381 privatized firms. In general, the key explanatory variables resemble those used in the literature. For example, the means of *FIO* and *DIO* are 0.041 and 0.174, respectively.

[Insert Table 2]

5. Baseline Results

5.1 Does Foreign Institutional Ownership Increase Corporate Risk-taking?

Table 3 presents the coefficient estimates when regressing corporate risk-taking variables on foreign and domestic institutional ownership. The empirical results show that *FIO* (*DIO*) is positively (negatively) related to all five corporate risk-taking variables at the 1% significance

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

level, indicating that *FIO* (*DIO*) promotes (reduces) corporate risk-taking. These results are both statistically and economically significant. As shown in Column 1, the coefficient estimates (p-values) 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 that the standard deviation of *FIO* (*DIO*) is 0.070 (0.274) and the mean of *RISK1* is 0.067. The results support **H1** (**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 a 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.[8] 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* when using alternative country-level corporate

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

governance variables. This suggests that the positive impact of *FIO* on corporate risk-taking is more pronounced in countries with weaker 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 verify the above findings, we create two subsamples, one consisting of firms in developing countries (i.e., developing country investees) and the other consisting of firms in developed countries (i.e., developed country investees). Then, we examine the impact of *FIO* from 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 influences corporate risk-taking for both developing and developed investee countries, while the coefficient estimates of $FIO_{Developing}$ are positive but insignificant. This suggests that only foreign institutional investors from developed countries can strengthen 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) than 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.[9] This 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 empirical results demonstrate a substitution effect between *FIO* and country-level corporate governance. That is, foreign institutional investors effectively motivate

[9] 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*.

corporate risk-taking in countries with weaker corporate governance, and this increasing role is attenuated in countries with stronger corporate governance.

6. Endogeneity Tests

We show that *FIO* increases corporate risk-taking. However, it is possible that foreign institutional investors are attracted to invest in firms with higher corporate risk-taking or that an unobserved factor affects both *FIO* and corporate risk-taking.[10] To tackle the reverse causality and endogeneity issue, we adopt both regression-based and event-study approaches, which are described as follows.

6.1 Regression-based Approaches

We 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., the five-year forward-looking *ROA* volatility), it is likely that there are high autocorrelations between the consecutive years of our corporate risk-taking variables. To mitigate this concern, we re-examine the baseline regression based on a subsample, ensuring that there are no overlaps in risk-taking variables. In particular, the subsample only includes observations in the years 2000, 2005, and 2010. As shown in Column 1 of Table 6, the results are qualitatively unchanged, suggesting that our findings are not likely driven by the autocorrelations between the consecutive years of risk-taking variables.

[Insert Table 6]

The second approach is to use *difference regressions*.[11] In particular, we take the one-year (or five-year) difference of the dependent and independent variables and then examine the baseline regression with these differenced variables rather than their levels. By taking the difference, we remove the unobservable time-invariant firm factors that could drive the relation between *FIO* and corporate risk-taking. Columns 2 and 3 of Table 6 present the results of *one-year-difference* and *five-year-difference regressions*, respectively. The results remain qualitatively unchanged.

[10] For example, firms with an effective corporate governance mechanism may attract more foreign investments (Leuz et al. (2009)). Meanwhile, an effective corporate governance mechanism may also motivate managers to take higher risk.

[11] The *difference regression* approach is widely used in previous literature to address the endogeneity issue (e.g., Wooldridge (2010), Li et al. (2011), Chen et al. (2013), among others).

The third approach is to use the firm-fixed effect to control for time-invariant unobservable firm heterogeneity. 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 when 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 2SLS regression. We use the membership in the MSCI ACWI as an instrumental variable for *FIO* (Aggarwal et al. (2011); Luong et al. (2017)). The MSCI ACWI is designed to measure the performance of the global equity market, and it contains approximately 85% of the free float-adjusted market capitalization in each country. On the one hand, foreign institutional investors rely on MSCI ACWI as a benchmark in their portfolio holdings; thus, it creates exogenous variations in *FIO*. In particular, Ferreira and Matos (2008) and Leuz et al. (2009) find that firms with MSCI membership attract more foreign capital. On the other hand, it is unlikely that MSCI membership directly influences firms' risk-taking behavior. In particular, the rule of inclusion in the MSCI ACWI relies solely on a firm's free-float adjusted market capitalization ranking within a country rather than its expected risk-taking. We define the instrumental variable (*MSCI*) as a dummy variable equal to one if a firm is included in the MSCI ACWI, and zero otherwise. Column 5 of Table 6 shows that *MSCI* significantly increases *FIO* in the 1st stage regression, indicating that foreign investors tend to use MSCI ACWI as a benchmark in their portfolio holdings. Then, we extract its fitted value in the 1st stage regression as the instrumented *FIO* (i.e., $\widehat{FIO}$) and examine its impact on corporate risk taking in the 2nd stage regression. Column 5 of Table 6 shows that $\widehat{FIO}$ increases corporate risk-taking, which is consistent with the results in the baseline regression.

The bottom panel of Table 6 reports diagnostic tests to assess the validity of *MSCI* as an instrumental variable. First, it satisfies the rank condition, since the p-value of the Kleibergen-Paap rk LM statistic is 0.001, rejecting the null hypothesis that the equation is under-identified. A test of the significance of the instrumental variable in the first-stage regressions yields an F statistic of 71.643, exceeding Staiger and Stock's (1997) rule of thumb value of 10 as well as Stock and Yogo's (2005) 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.[12] Therefore, the diagnostic tests strongly support the validity of the 2SLS regression results.

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

To further establish a causal effect of *FIO* on corporate risk-taking, we conduct a quasi-natural experiment by using stock additions (deletions) to (from) the MSCI ACWI (Bena et al. 2017). In particular, we carry out a difference-in-differences (DiD) estimation around the time of stock additions (deletions) to (from) the MSCI ACWI. We identify 244 (99) stock additions (deletions) in our sample, which are identified as treated firms. For each treated firm, we match a control firm by using the nearest neighbor propensity score matching approach. Specifically, we estimate a logit model with the dependent variable equal to one if a firm experiences a stock addition (deletion), and zero otherwise. The logit model controls for the same set of independent variables as those used in the baseline regression, the one-year risk-taking growth variable (is denoted $Growth_{RISK1}$, and it ensures that the parallel trend assumption of the DiD estimation is satisfied) (Luong et al. 2017), and industry-, year-, and country-fixed effects. Then, each treated firm is matched to a control firm based on the nearest neighbor propensity score matching with replacement.

Panel A shows the pre-treatment (i.e., two years before the treatment) means of the treated and matched control firms and the tests of the difference in means between the two groups. In general, we are unable to reject the hypothesis of equal means between the treated and matched control firms. In addition, the pre-treatment $Growth_{RISK1}$ is not significantly different between the treated and matched control firms. This suggests that there is no observable pre-treatment trend in corporate risk-taking outcomes between the two groups of firms, thus providing evidence to support the parallel trend assumption.

[Insert Table 7]

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

[12] 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 the weak instrument problem.

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

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

Panel B of Table 7 reports the empirical results of the DiD estimations. 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 additions (deletions) to (from) the MSCI ACWI. In Columns 3 and 4, the dependent variables are *RISK1*. The coefficient estimates of *TREAT*×*POST* are positive (negative) and statistically significant, indicating that the treated firms experience a significantly larger increase (decrease) in corporate risk-taking relative to the control firms after a stock is added (deleted) to (from) the MSCI ACWI.

Panel A (B) of Figure 1 shows the evolution of the differences in *RISK1* between the treated and matched control firms in the two years before and after the stock additions (deletions) to (from) the MSCI ACWI. The events occur between years (-1 to 0). We find that the figures in both panels follow a relative parallel trend in the pre-event period, and the differences in *RISK1* between the treated and matched control firms are significantly increased (decreased) after the stock additions (deletions). In sum, the results are qualitatively similar to those obtained by using the 2SLS approach, indicating that the exogenous variations in *FIO* from stock additions (deletions) to (from) the MSCI ACWI significantly increase (decrease) corporate risk-taking.

[Insert Figure 1]

6.3 Corporate Risk-taking around Foreign Block Purchases

To further clarify the causality direction in the relation between *FIO* and corporate risk-taking, we conduct an event study in a cross-border M&A context.[13] Specifically, we focus on the changes in corporate risk-taking of target firms, where *FIO* is increased due to foreign block

[13] Our methodology is similar to that of Li et al. (2011), which suggest that the stock-volatility-reduction effect is a causal outcome of large foreign shareholder participation. The M&A data are collected from the SDC Platinum M&A Database.

purchases.[14] To ensure that the event windows are independent of each other, we limit our sample to firms that are targeted by a foreign block purchase for the first time. There are 464 firms satisfy the above criteria. We calculate the average *ROA* volatility for pre- and post-event periods up to five years. For the pre-event period, we compute the average *ROA* volatility from the years (-5 to -1), (-4 to -1), and (-3 to -1). For the post-event period, we compute the average *ROA* volatility from the years (+1 to +3), (+1 to +4), and (+1 to +5). We match each treated firm with a control firm with the closest market capitalization in the same industry, country, and year.

Panel A of Table 8 shows a significant increase in corporate risk-taking after foreign block purchases. In particular, it shows that the differences in average *ROA* volatility between treated firms and matched control firms are positive and significant at the 1% level in Rows 4-6 (i.e., after foreign block purchases) but not in Rows 1-3 (i.e., before foreign block purchases). This implies that foreign block purchases generate ex-post increases in corporate risk-taking, but they are not driven by the ex-ante corporate risk-taking. It is unlikely that the previous findings arise simply because foreign investors (who face information disadvantages compared to domestic investors) are able to forecast corporate risk-taking and choose to acquire firms that take higher risk (French and Poterba (1991); Kang and Stulz (1997); Dahlquist and Robertsson (2001); Portes and Rey (2005)). Thus, the above evidence suggests that the observed increased corporate risk-taking is a causal outcome of the increased *FIO* due to foreign block purchases.

[Insert Table 8]

In addition, we use the nearest neighbor propensity score matching approach to match the treated firms and control firms, which allows us to control for other economic motivations (compared to only matching by market capitalization in the previous test). Specifically, we estimate a logit model with the dependent variable equal to one if a firm is announced to be the target of a foreign block purchase, and zero otherwise. The logit model controls for the one-year lagged variables used in the baseline regression (i.e., *FIO*, *DIO*, *ROA*, *LEVERAGE*, *SIZE*, *SALESGROWTH*, and *CAPEX*) as well as year-, industry-, and country-fixed effects. Then, each treated firm is matched to a control firm based on the nearest neighbor propensity score with replacement. By matching on the propensity score, we ensure that the economic motivations for foreign block purchasers are similar between the treated and matched control firms along the

[14] We use the *block purchase indicator* in the Platinum M&A Database to identify block purchases.

propensity score characteristics.

Panel B of Table 8 reports the results of the propensity score matched sample. As a diagnostic test, we compare the differences in the means of the firm-level variables between the treated and matched control firms, and find that the observed characteristics are not significantly different between the two groups. This suggests that the predicted probability of being announced as a target of foreign block purchases does not differ significantly across the two samples. Consistent with the results in Panel A, the differences in average *ROA* volatility for treated firms and matched control firms are statistically insignificant (positive at the 1% significance level) before (after) foreign block purchases. This suggests that the variation in corprate risk-taking across the two samples is likely to be attributed to foreign block purchases. Therefore, after controlling for other economic motivations (e.g., profitability, financial leverage, firm size), the motivation of corprote governance improvement by *FIO* still exists.

We have found that corprate risk-taking, on average, increases after foreign block purchases. However, it is unclear how these foreign acquirers motivate the risk-taking of target firms. To do this, we consider the corprate risk-taking of the control firm as the risk-taking norm of the treated firm. This is plausible because they have similar firm characteristics and corporate risk-taking before a foreign block purchase. Then, we define the abnormal risk taking (i.e., $\Delta Risk\_taking$) as the difference in corporate risk-taking between the treated and matched control firms. Next, we employ the following multivariate regression framework to examine the impact on abnormal risk taking,

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

where *FBP* is the percentage of shares acquired by a foreign block purchase. ΔCG is the difference in country-level corporate governance variables between acquirer and target firm nations. *CONTROLS* includes various deal characteristics and the differences in country-level variables between acquirer and target firms, including *PREMIUM*, *ALLCASH*, *FRIENDLY*, *INDUSRTY*, *CONTINENT*, *LANGUEGE*, ΔGDP, and $\Delta GDPGROWTH$.

Table 9 presents the results of the multivariate regression. As shown in Column 1, *FBP* is positively related to $\Delta Risk\_taking$, indicating that a higher percentage of foreign block purchases is related to a larger difference in corporate risk-taking between treated and matched control firms. In Columns 2-4, we control for $\Delta ACCSTD$ and $\Delta ANTID$, which represent the

differences in country-level accounting transparency and shareholder protection between the acquirer and target firm nations. The results show that they are both positive and statistically significant, suggesting that the corporate risk-taking of target firms is largely influenced by the convergence in corporate governance standards. Acquirers in countries with stronger corporate governance standards have higher expectations for the governance practices of target firms. Thus, these acquirers are more likely to act on their expectations by pressuring target firms to adopt stronger governance practices (Aggarwal et al. (2011)). As a result, the governance motivation behind foreign block purchases is an important factor in encouraging the risk-taking of target firms. In contrast, the coefficient estimates of ΔGDP and $\Delta GDPGROWTH$ are mostly insignificant. The *INDUSTRY* dummy, which captures whether the target and acquirer firms share the same two-digit SIC code, is also insignificant. This suggests that the economic motivation to horizontally integrate has no impact on the risk-taking of target firms. These results suggest that the governance motivation is more pronounced than the economic motivation behind the positive impact of foreign block purchases on corporate risk-taking.

[Insert Table 9]

7. Possible Economic Mechanisms of the Positive Impact of *FIO* on Corporate Risk-taking

7.1 Monitoring Channel

The agency conflicts between managers and shareholders result from the separation of ownership and control. Due to career and reputation concerns, risk-averse managers could choose not to take risky projects even if they enhance firm value. The monitoring role of foreign institutional investors is thus an important governance mechanism to mitigate such agency conflicts. This section examines whether *FIO* could influence corporate risk-taking through its monitoring role.

Previous literature suggests that different types of institutional investors conduct different levels of monitoring. Brickley et al. (1988) find that mutual funds and investment advisors tend to be active monitors, while banks and insurance companies are more supportive of management actions. Almazan et al. (2005) suggest that investment advisors and investment companies have advantages in monitoring. In addition, Ferreira and Matos (2008) argue that *independent institutions*, such as mutual funds and investment advisers, actively collect information, are subject to fewer regulatory restrictions, and have fewer potential business relationships with the invested firms. That is, they play a strong monitoring role, and they may intervene in

management decisions. Conversely, *grey institutions*, such as banks, insurance companies, pension funds and endowments, have higher monitoring costs, are more loyal to corporate management, and are more likely to hold shares without reacting to the management actions of the invested firms.

To examine whether the impact of *FIO* on corporate risk-taking varies for different types of institutional investors, we construct FIO_{Type}, representing the *FIO* for a particular type of institution. Table 10 presents the estimating results of corporate risk-taking on *FIO* for each institutional type. Columns 3, 4, and 6 show that *FIO* is positively and significantly related to corporate risk-taking for foreign *independent institutions*, including mutual funds, investment advisors, hedge funds, and venture capital. As shown in Column 7, the empirical results are qualitatively unchanged if we use an aggregated measure of foreign *independent institutions* (i.e., $FIO_{Independent}$). On the other hand, Columns 1, 2, and 5 show insignificant results for foreign *grey institutions*, including banks, insurance companies, pension funds, and endowments. This indicates that foreign *independent institutions* actively and effectively monitor the firms, in turn influencing their corporate risk-taking decisions.

[Insert Table 10]

Bushee (1998) argues that frequently trading institutional investors encourage managers to pursue short-term earnings goals, while long-term institutional ownership serves to reduce managers' pressure and encourages them to pursue long-term investments. In addition, Chen et al. (2007) suggest that institutions with long-term investments specialize in monitoring rather than trading.

To examine whether long-term *FIO* influences corporate risk-taking, we construct $FIO_{Long-term}$, representing the *FIO* held by long-term institutional investors. Following Gaspar et al. (2005), 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 stock 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 annual 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 the yearly average *CR* across all institutional investors.

As shown in Column 8 of Table 10, the coefficient estimate of $FIO_{Long-term}$ is positive and statistically significant at the 1% level. $FIO_{Excluding\ long-term}$ is also positively related to corporate risk-taking, but the magnitude is relatively small compared to that of $FIO_{Long-term}$ (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, this indicates that the positive impact of *FIO* on corporate risk-taking is achieved through the *monitoring channel*.

7.2 International Diversification Channel

The benefits associated with international diversification have been extensively discussed in previous literature.[15] Foreign institutional investors could effectively reduce their overall portfolio risk through international diversification, thus having incentives to push managers to pursue riskier investments. This section examines how foreign international investors' portfolio risk reduction potentially 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 the foreign portfolio ratio (*FPR*) (Denis et al. (2002); Duru and Reeb (2002); Thomas (2002)). In particular, *IDI* is the complement of the Herfindahl Index (*HHI*), with a range from zero to one,

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

where s_i denotes the market share of foreign institutional investors' portfolios in country j. *CC*

[15] For example, De Roon et al. (2001) argue that international diversification benefits are smaller for U.S. investors, while Driessen and Laeven (2007) suggest that the benefits of overseas investments are higher for investors from developing countries.

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 of 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, we examine the impact of FIO_{High_ID} (FIO_{Low_ID}) on corporate risk-taking.

Columns 1-3 of Table 11 show that the coefficient estimates of FIO_{High_ID} (FIO_{Low_ID}) are positive and significant at the 1% level (insignificant). This suggests that the motivation for foreign institutional investors to push managers to take higher risk is largely attributable to their ability to diversify portfolios internationally.

[Insert Table 11]

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 of Table 11 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 impact of international diversification on risk-taking is only evident for foreign institutional investors. 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.

In sum, we find that foreign institutional investors with 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, potentially due to their

business ties with invested firms. Overall, *FIO* increases corporate risk-taking through the *international diversification channel*.

8. Foreign Institutional Ownership and Innovation

As discussed earlier, foreign institutional investors equip firms with both monetary and non-monetary capital, which allows them to implement riskier projects. Innovation as a likely outcome of risk-taking activities is encouraged by foreign institutional investors.[16] That is, *FIO* encourages firms to input more resources and generate more innovation outputs. This section examines whether *FIO* can increase both the input and output of innovation in our sample. Specifically, as the input of innovation, we construct an R&D expenditure variable (*R&D*) that is the average R&D-expenses-to-assets ratio over a five-year overlapping period beginning from the current year. As the innovation output, 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.

Consistent with the Bena et al. (2017) and Luong et al. (2017), Table 12 shows that *FIO* has a positive impact on both the input and output of firms' innovation. As shown in Columns 1-3, *FIO* significantly increases both the innovation input (i.e., *R&D*) and output (i.e., *LnPatent* and *LnCitePat*). This suggests that foreign institutional investors encourage firms to take more risks through monitoring managerial actions. They effectively reduce managers' propensity to avoid risky investments, such as R&D expense.

[Insert Table 12]

9. Robustness Tests

Similar to other international studies, the number of U.S. firms dominates the sample. In particular, there are 31,928 firm-year observations from the U.S., which corresponds to 27.59% of our entire sample. As a robustness check, we examine the subsample that excludes the U.S. firms. Columns 1 and 2 of Table 13 show that the results are similar to the baseline regression in

[16] Guadalupe et al. (2012) argue that firms acquired by foreign acquirers increase their innovation processes by assimilating foreign technologies. Bena et al. (2017) find that *FIO* fosters long-term investment and leads to significant increases in innovation output. Luong et al. (2017) suggest that *FIO* encourages innovation by playing an active monitoring role, providing managers with insurance against innovation failures, and promoting knowledge spillovers from high-innovation countries.

both the non-U.S. and U.S. subsamples, respectively. Thus, our findings are not driven by the U.S. observations.

[Insert Table 13]

We also perform a robustness check by including two additional control variables to mitigate concern over the omitted variable issue. First, we include *ADR* (i.e., a dummy variable equal to one if a firm is an ADR, and zero otherwise) to capture the attractiveness of firms to foreign (i.e., the U.S.) institutional investors. An ADR is a stock that trades in the U.S. but represents a specified number of shares of a foreign firm. Thus, these "foreign" stocks are more attractive to the U.S. investors than those listed in their home countries. Second, we include *MajorIndex* (i.e., a dummy variable equal to one if a firm is included in the major index of its home country, and zero otherwise) to identify large stocks.[17] These firms are more globally orientated in their activities and tend to adopt internationally recognized governance practices (Drobetz et al. (2004)). Thus, they are more attractive to foreign investors in forming their investment portfolios. Of our sampled firms, 5.4% are considered as ADR, while 38.6% are contained in the major index of their home countries.

We explicitly control for *ADR* and *MajorIndex* in the regression to examine whether the positive impact of *FIO* on corporate risk-taking remains valid. Column 3 of Table 13 shows that *ADR* (*MajorIndex*) significantly increases (decreases) corporate risk-taking. More importantly, our main findings remain qualitatively unchanged, that is, *FIO* increases corporate risk-taking even after controlling for these two additional variables. This suggests that the positive relation between *FIO* and corporate risk-taking is still valid when controlling for the firms' attractiveness to foreign investors.

10. Conclusion

Motivating corporate risk-taking is pivotal because corporate risk-taking is essential to corporate growth and economic growth (John et al. (2008)). Along with the globalization of the world economy, foreign institutional investors are playing an increasingly significant role globally. Therefore, it is necessary to examine the impact of *FIO* on corporate risk-taking. Our main conclusions are described as follows.

[17] *MajorIndex* is identified from the Worldscope item 05661 (i.e., stock index information). For example, the major index is the S&P 500 for U.S. firms, FT-SE 100 in the United Kingdom, and TOPIX in Japan.

First, employing a large sample of 17,698 firms across 42 countries spanning the years 2000 to 2015, we show that *FIO* significantly increases corporate risk-taking, and this positive relation is achieved through the *monitoring channel* and the *international diversification channel*. 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. This supports the view that foreign institutional investors play a strong role in motivating managers to take higher risk in countries with weaker corporate governance. Therefore, our evidence shows that *FIO* and country-level corporate governance are substitutes. Third, we show that *FIO* has a positive effect on firms' innovation input and output. We expect that if foreign institutional investors are able to motivate corporate risk-taking, they could reduce the incentive of managers to avoid investment in risky and costly innovative projects. This suggests that *FIO* induces managers to invest in long-term and value-enhancing innovative projects.

Our findings are robust to alternative risk-taking variables and alternative approaches to address the endogeneity issue, including the following: examining the regression based on a subsample ensuring that there are no overlaps in risk-taking variables; using *difference regressions*, a firm-fixed effect regression, and a 2SLS regression; performing a quasi-natural experiment by using stock additions (deletions) to (from) the MSCI ACWI; and examining whether the increase in *FIO* due to cross-border M&As increases corporate risk-taking.

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. Based on our findings, foreign investors from a context of stronger corporate governance are particularly effective at motivating corporate risk-taking in countries with weaker corporate governance, but not the other way around. This 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).

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 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	3.698	3.115	1.810	3.670	5.524
ECONFREEDOM	404	7.253	0.829	6.550	7.265	7.910
GDP	404	9.174	1.405	7.958	9.273	10.457
IR	404	4.873	7.807	1.445	3.490	5.725
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. Foreign 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 the country level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Variable definitions are provided in 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 when 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 the country level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Variable definitions are provided in 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. Foreign 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 when 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 the country level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Variable definitions are provided in 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. Foreign Institutional Ownership and Corporate Risk-taking: Endogeneity Tests

This table reports the results of regression-based approaches that attempt to address the endogeneity issue. The dependent variable is the corporate risk-taking variable (*RISK1*). The results are qualitatively similar when using alternative risk-raking variables. *FIO* (*DIO*) is the percentage of foreign (domestic) institutional ownership of a firm. *MSCI* is a dummy variable equal to one if a firm is included in the MSCI ACWI, and zero otherwise. *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 the country level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Variable definitions are provided in Appendix A.

	Subsample (2000, 2005, 2010)	*One-year Difference*	*Five-year Difference*	*Firm-fixed Effect*	*1st stage: FIO*	*2nd stage: RISK1*
	[1]	[2]	[3]	[4]	[5]	[6]
FIO / $\widehat{FIO}$	0.057***	0.013***	0.033***	0.035***		0.167***
	(0.000)	(0.006)	(0.003)	(0.000)		(0.001)
DIO	-0.026***	0.000	-0.007**	-0.006***	-0.006	-0.024***
	(0.000)	(0.972)	(0.026)	(0.000)	(0.482)	(0.000)
MSCI					0.054***	
					(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	0.316	0.417
N	28,075	96,025	42,303	115,726	115,726	115,726
Under-identification test (H0: under-identified)						
(A) Kleibergen-Paap rk LM statistic						10.436
P-value						0.001
Weak instruments (H0: Instruments are weak)						
(B) First-stage F statistic (FIO)						71.643
P-value						0.000
(C) Kleibergen-Paap Wald rk F statistic						71.643
10% critical value						16.380

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

This table shows the results of difference-in-differences regressions of corporate risk-taking around the time of stock additions (deletions) to (from) the MSCI ACWI. Panel A shows the pre-treatment (i.e., two years before the treatment) means of treated and control firms and tests of the difference in means between the two groups. Treated firms are those firms that experience a stock addition (deletion) to (from) the MSCI ACWI. Each treated firm is matched to a control firm by using the nearest neighbor propensity score matching approach. *TREATED* is a dummy variable equal to one if a firm is added (deleted) to the MSCI ACWI, and zero otherwise. *POST* is a dummy variable equal to one in the year a firm is added (deleted) to the MSCI ACWI and thereafter, and zero otherwise. Beneath each coefficient estimate is the p-value in parentheses based on robust standard errors clustered at the country level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Variable definitions are provided in Appendix A.

Panel A: Summary Statistics (Pre-event)

Stock Additions to the MSCI ACWI

	Pre-event Treated Firms (N=244)	*Pre-event Control Firms (N=244)*	*Difference in Means*	
	Mean	*Mean*	*Difference [1]-[2]*	*T-statistic*
	[1]	[2]	[3]	[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 ACWI

	Pre-event Treated Firms (N=99)	*Pre-event Control Firms (N=99)*	*Difference in Means*	
	Mean	*Mean*	*Difference [1]-[2]*	*T-statistic*
	[1]	[2]	[3]	[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: Difference-in-differences Estimation				
Stock Additions to the MSCI ACWI				
	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 ACWI				
	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. Corporate Risk-taking around Foreign Block Purchases

This table presents the announcement effect of corporate risk-taking around foreign block purchases. 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) and 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 [1]	*Average ROA Volatility* [2]	*Difference* [1]-[2] [3]	*T-statistic* [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

	Pre-event Treated Firms (N=270)	*Pre-event Control Firms (N=270)*	*Difference in Means*	
	Mean [1]	*Mean* [2]	*Difference* [1]-[2] [3]	*T-statistic* [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 [1]	*Average ROA Volatility* [2]	*Difference* [1]-[2] [3]	*T-statistic* [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 9. Foreign Block Purchases and Corporate Risk-taking

This table reports the OLS estimation of the following model:

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

$\Delta Risk\_taking$ is the difference in corporate risk-taking between the treated and matched control firms. *FBP* is the percentage of shares acquired by a 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, including *PREMIUM*, *ALLCASH*, *FRIENDLY*, *INDUSRTY*, *CONTINENT*, *LANGUEGE*, ΔGDP, and $\Delta GDPGROWTH$. Beneath each coefficient estimate is the p-value in parentheses based on robust standard errors clustered at the country level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Variable definitions are provided in Appendix A.

	[1]	[2]	[3]	[4]
FBP	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)
$\Delta ANTID$			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)
ALLCASH	0.001	-0.012	-0.006	-0.012
	(0.939)	(0.431)	(0.670)	(0.435)
FRIENDLY	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 10. Foreign 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 when 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 the country level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Variable definitions are provided in 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 11. Foreign 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 when 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 the country level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Variable definitions are provided in 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 12. Foreign 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 include *R&D*, *LnPatent*, and *LnCitePat*. *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 the country level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Variable definitions are provided in 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 13. Robustness Tests

This table reports the OLS estimation of the following model:

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

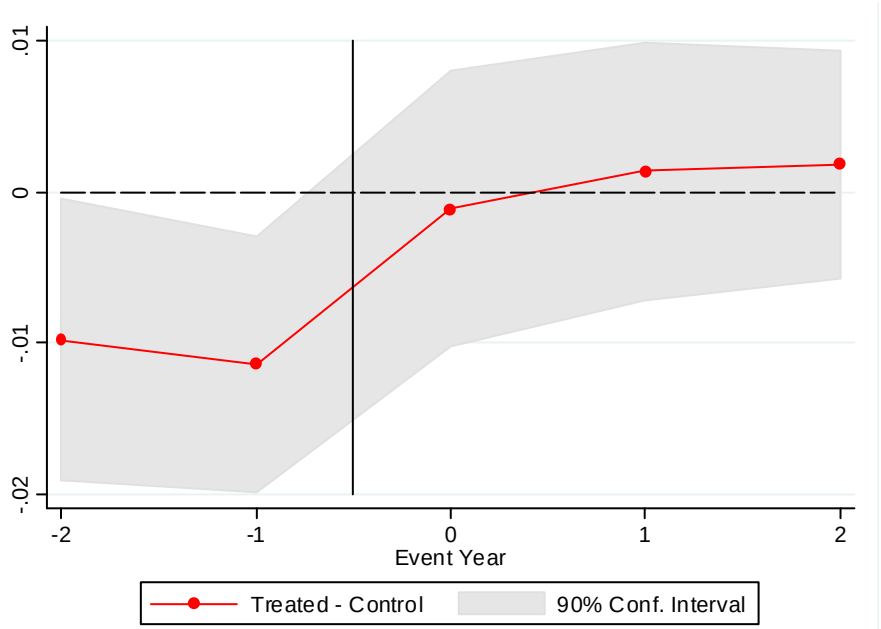
Risk_taking is the corporate risk-taking variable (*RISK1*). The results are qualitatively similar when using alternative risk-raking variables. *FIO* (*DIO*) is the percentage of foreign (domestic) institutional ownership of a firm. *ADR* is a dummy variable equal to one if a firm is an American Depository Receipt, and zero otherwise). *MajorIndex* is a dummy variable equal to one if a firm is included in a major index of their country, and zero otherwise. *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 the country level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Variable definitions are provided in Appendix A.

	Non-U.S. Firms [1]	U.S. Firms [2]	Additional Control Variables [3]
FIO	0.047***	0.087***	0.053***
	(0.000)	(0.000)	(0.000)
DIO	-0.042***	-0.025***	-0.023***
	(0.003)	(0.000)	(0.000)
ADR			0.006***
			(0.008)
MajorIndex			-0.004**
			(0.015)
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

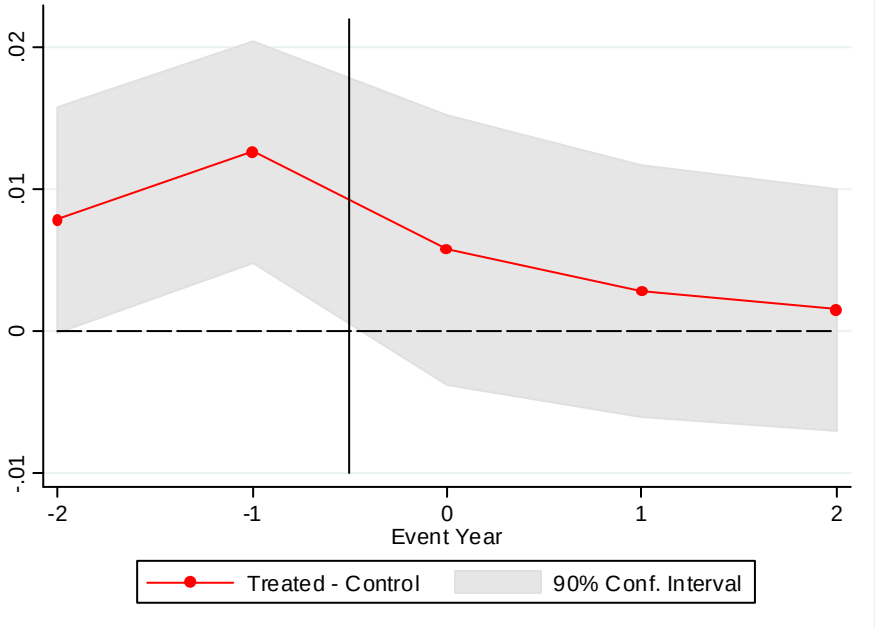
Figure 1: Corporate Risk-taking of Treated and Control Firms around Stock Additions (Deletions) to (from) the MSCI ACWI

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

Panel A: Stock Additions to the MSCI ACWI



Panel B: Stock Deletions from the MSCI ACWI



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 the firm's market capitalization.	FactSet
Domestic Institutional Ownership	***DIO***	The aggregate equity holdings by domestic institutions scaled by the firm's 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. dollars.	Worldscope
Sales Growth	***SALESGROWTH***	The annual sales growth rate.	Worldscope
Capital Expenditure	***CAPEX***	The ratio of capital expenditure to book value of assets.	Worldscope
GDP Growth	***GDPGROWTH***	The annual GDP growth rate, at constant 2005 U.S. dollars.	WDI
Economic Freedom Index	***ECONFREEDOM***	A measure of 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 the 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. dollars.	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 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, equal to the arithmetic mean of: (1) prospects, (2) compensation, (3) shareholders, (4) inside ownership, (5) irregular contracts, and (6) transactions.	La Porta et al. (2006)

Liability Standard Index	***LIASTA***	The index of liability standards, equal to 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 equal to one if a country adopts a 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 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 equal to 10 percent (the sample median), or (6) shareholders have preemptive rights that can be waived only by a shareholders' vote.	La Porta et al. (1998)
Corporate Governance Index	***CGI***	The percentage of firms in the country that give satisfactory ratings to the questions on the protection of minority shareholders, quality training, willingness to delegate authority, discouragement of nepotism, and corporate governance.	Kaufmann (2004)
Control of Corruption	***COC***	A measure that captures the 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: 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

Panel F: Deal-level Variables			
Foreign Block Purchases	***FBP***	The number of common shares acquired in the transaction divided by the total number of shares outstanding.	SDC Platinum
Acquisition Premium	***PREMIUM***	Bid price as a percentage of the closing price of the target four weeks prior to the announcement.	SDC Platinum
All-cash Bid	***ALLCASH***	Dummy variable equal to one if the acquisition is entirely paid in cash, and zero otherwise.	SDC Platinum
Friendly Bid	***FRIENDLY***	Dummy variable equal to one if the bid is classified as a friendly bid, and zero otherwise.	SDC Platinum
Same Industry	***INDUSTRY***	Dummy variable equal to one if the target and acquirer firms share the same two-digit SIC code.	Datastream
Same Continent	***CONTINENT***	Dummy variable equal to one if the target and acquirer firms are from the same continent, and zero otherwise.	The World Factbook
Same Language	***LANGUAGE***	Dummy variable equal to one if the target and acquirer firms share the same official language, and zero otherwise.	The World Factbook