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The impact of foreign investors on the risk-taking of Japanese firms

Abstract

Consistent with a bank-centered governance system, Japanese firms exhibit an exceptionally low level of performance variability. The increased involvement of foreign investors motivated by shareholder value is thus likely to have triggered a major shift in their risk-taking behavior. My results confirm this assumption as all standard measures of performance volatility appear to have significantly increased with the level of foreign ownership. Controlling for endogeneity provides higher point estimates supporting anecdotal evidence that foreign investors have targeted firms taking unusually low risk. Overall, the evidence highlights the considerable impact that this category of investors can have on a firm's decisions and, by consequence, on its performance.

Keywords: foreign ownership; monitoring; risk taking; performance volatility

JEL classification: G30, G32, G34

1. Introduction

The importance of risk taking is well recognized. To expect a higher return, investors must take more risk. At the firm level, a similar tradeoff exists. To create shareholder value, firms must invest in projects that are associated with high idiosyncratic risk. However, managers are typically reluctant to undertake this type of project (Fama, 1980). While shareholders can easily diversify away the firm's specific risk, managers continue to carry that risk. As a result, they may prefer to forgo positive NPV projects that have high idiosyncratic risk. May (1995) and Holmstrom (1999) explain that managers consider their personal welfare when making decisions that affect their firm's risk profile. Bertrand and Mullainathan (2003) show that whenever they are given the opportunity, plant managers choose to take less risk. Similarly, Amihud and Lev (1981) suggest that one of the motivations for undertaking unrelated mergers, which usually destroy shareholder value, is to reduce the risk to their human capital.

To mitigate the propensity of managers to avoid risk, one approach is to provide equity-based compensation. Smith and Stulz (1985), Dechow and Sloan (1991) and Wright et al. (2007) argue that this type of contract contributes to align the incentives of managers with those of shareholders, thus resulting in higher risk taking. The alternative approach to curb deviations from optimal risk-taking is to improve the firm's governance structure. In line with this view, John et al. (2008) show that better governance is associated with greater risk-taking measured by cash flow volatility. Low (2009) highlights the disciplinary role of takeover threats. According to her findings, US firms that became less exposed to takeovers due to an exogenous change in regulation reduced their risk taking. However, the propensity to cut risk was moderated when managers had equity incentives.

In this paper, my objective is to evaluate the influence of foreign investors on the risk-taking behavior of Japanese firms. Regardless of the target country (here, Japan), the effect of foreign investors is expected to be positive since they tend to be large institutions that have the power to influence a firm's policy (Shleifer and Vishny, 1986; Gillan and Starks, 2003; Cronqvist and Fahlenbrach, 2009). In particular, they should be able to mitigate the widespread tendency of managers to take insufficient risk. Domestic institutions are unlikely to exert a similar influence. Concerns about existing business relationships prevent them from being too critical of management decisions (Ferreira and Matos, 2008; Jackson and Moerke,

2005). In contrast, foreign investors are less hindered by such ties and should therefore be more potent monitors.

In the particular case of Japan (the target country) the impact of foreign investors is expected to be even stronger due to the exceptionally low level of corporate risk taking. As a matter of fact, the cross-country study of John et al. (2008) reveals that Japanese firms exhibit the lowest cash flow volatility. This low level of risk taking can be explained by a governance system that is relatively favorable to creditors (Shleifer and Vishny, 1997; Acharya et al., 2011). In this situation, the main objective is less to maximize the firm's value than it is to preserve its survival and ability to repay its debt. In addition, the practice of lifetime employment implies that human capital is largely tied to the firm, which suggests that managers will be very reluctant to take the risk of going bust.[1] From a cultural viewpoint, risk taking is viewed with hostility in Japan unlike in the US where it is celebrated.[2] To emphasize this point, individual rewards tend to be small even for employees making outstanding contributions to their organizations. Further, the tendency to seek consensus in decision making suggests a lower degree of risk taking consistent with the theoretical models of Sah and Stiglitz (1986, 1991) and empirical evidence in Adams and Ferreira (2010).

Following Cheng (2008) my investigation begins with a cross-sectional analysis. The results show a strong positive relation between foreign ownership and corporate risk taking. In contrast, domestic institutional ownership is associated with lower risk taking. I then use an instrumental variable approach to control for the endogeneity of foreign ownership.[3] My instruments are indicators of whether the firm had an ADR or was a constituent of the MSCI World index in 1998 which is the beginning of the sample period. Ferreira and Matos (2008), Ferreira et al. (2010) and Aggarwal et al. (2011) establish that both variables are strong determinants of foreign ownership. In addition, they are unlikely to involve the firm's risk taking except indirectly through other independent variables, which over-identification tests clearly confirm. The reason is that ADRs have been issued with a totally unrelated purpose (to increase the firm's visibility in the US market) while inclusion in the MSCI index is based on the firm's industry affiliation and market value (and not the firm's risk profile). Hence,

[1] Ono (2010) provides extensive evidence regarding the continuing practice of lifetime employment in Japan.

[2] According to Hofstede's (2001) analysis, Japan is characterized by a high degree of uncertainty avoidance.

[3] Indeed, the positive relation between foreign ownership and risk taking may derive from the fact that foreign investors prefer to invest in high risk firms. In this respect, Ferreira and Matos (2008) show that high foreign institutional ownership is associated with high firm-level idiosyncratic variance.

conditioning on the instruments achieves the same result as a randomized assignment (i.e., it compares different levels of foreign ownership that are formed without connection to the firm's risk taking).

In a preliminary analysis, I show that foreign investors tend to select low-risk firms, especially those with a low ROA volatility.[4] This finding is consistent with anecdotal evidence that foreign investors have picked out cash-rich firms and the fact that these firms are characterized by lower risk.[5] This finding also suggests that OLS estimates are likely to be understated and explains why instrumental variable regressions point to a stronger positive effect for foreign ownership.

I also take into account unobserved firm characteristics by running panel regressions with fixed firm effects. In line with Adams et al. (2005) risk is measured for each firm and each year by the absolute deviation from the firm's expected performance (for ROA and Tobin's Q). Detection of a statistically significant effect is facilitated by the substantial time-variation in foreign ownership. This is not the case of most governance variables which barely change over time (Zhou, 2001). Indeed, I show that the probability for foreign ownership to move to a different quartile within one year can be as high as 34.2 percent. Aggarwal et al. (2011) use this time-variation to establish the impact of foreign investors on firm-level corporate governance. Finally, I show that other ex ante measures of risk taking, such as the volume of R&D investments and acquisitions, increase with increases in the level of foreign ownership.

This paper contributes to the emerging and rapidly-growing literature regarding the role of foreign investors. Ferreira and Matos (2008) document that foreign institutional ownership is associated with higher firm value and performance outside of the US. Ferreira et al. (2010) show that it is also significantly associated with the intensity of cross-border M&A activity. Aggarwal et al. (2011) provide evidence that foreign investors increase the firm's corporate governance and improve its market value by increasing the likelihood that poorly-performing managers are dismissed. My contribution is to show that foreign investors can also strongly

[4] The aim may be to mitigate an unusual level of risk aversion or to induce firms to implement new policies that result in higher risk-taking. In this respect, the strategy adopted by Shinsei Bank is particularly revealing. In 2000, Shinsei became the first Japanese bank to be controlled by a group of foreign investors. Following a more aggressive business model, the bank heavily invested in collateralized debt obligations (CDOs) compared to other Japanese banks which by and large have avoided these risky financial products.

[5] See Baba (2009) for anecdotal evidence taken from the financial press.

influence another fundamental dimension of a firm's policy which is its risk taking behavior. By documenting that foreign investors have a significant effect on corporate risk taking, this study supports the view that they are also likely to have an impact on firm performance.

The results are consistent with a number of studies highlighting the role of foreign ownership in Japan. Ahmadjian and Robbins (2005) show that foreign investors increase the likelihood of divestitures and downsizing which are typically associated with higher firm performance. Nagaoka (2006) confirms that increases in foreign ownership are associated with higher firm value. David et al. (2006) provide evidence that foreign investors promote R&D investments when firms exhibit better growth opportunities. Baba (2009) reveals that their growing participation in the Japanese stock market has lead to a significant increase in dividend payout. Hamao et al. (2010) explain that foreign institutional investors facilitate the initiatives of activist funds requesting greater distributions, and are therefore associated with a significant decrease in cash holdings. Apart from its specific focus on corporate risk taking, this paper improves on earlier studies by controlling for the endogeneity of foreign ownership. This issue is critical since the portfolio allocation of foreign investors is far from being randomly distributed.

The rest of the paper is organized as follows. Section 2 describes the data and methodology. Section 3 presents the empirical results. I start with a standard cross sectional (OLS) analysis which is extended by instrumenting the foreign ownership variable. The panel analysis that follows takes into account unobservable firm characteristics. Section 4 concludes.

2. Data and methodology

2.1. Sample and data sources

The base sample is represented by all Japanese firms listed on the Tokyo Stock Exchange over the period 1998-2007. One reason to start in 1998 is because consolidated accounts are available from that year. A more important reason is because the late 1990s coincides with the time when foreign investors, and especially hedge funds, started to strongly increase their holdings of Japanese stocks (Hamao et al., 2010). Financial institutions, i.e. banks, securities and insurance companies, are excluded because of their different performance and risk-taking metrics. I also require at least 6 consecutive years of data to compute performance volatility measures. This reduces the sample to 1,615 firms providing 15,619 firm-year observations.

As in Baba (2009) my main data source is AMSUS (Active Management Support System) supplied by Quick Corp. The primary data is the same as Nikkei NEEDS which has been extensively used in Japanese accounting and finance research. The database also provides aggregate shareholding information, such as institutional ownership, corporate ownership and foreign ownership. Kang and Stulz (1997) observe that Japan is the only major country where this type of ownership information is widely available. To control for the endogeneity of foreign ownership,[6] I retrieved information on ADR listings from adr.com, while data related to the constituents of the MSCI World index was kindly provided by MSCI-Barra.[7]

2.2. Measurement and determinants of risk

The main empirical issue is to measure and relate risk to its potential determinants. In line with Cheng (2008) I start by defining risk as the volatility over time of a firm's performance measure (called within-firm across-time volatility). This procedure is relatively standard. In fact, it has been extensively applied to stock returns to produce estimates of return volatility and its systematic and idiosyncratic components. For example, Nguyen (2011) examines the effect of family and bank control on the risk-taking of Japanese firms using relative idiosyncratic risk as the measure of risk taking. Likewise, Konishi and Yasuda (2004) investigate the role of regulation (capital adequacy requirements) on the risk-taking behavior of Japanese banks.

Following Cheng (2008) I consider three measures of performance: ROA, Tobin's Q and stock return.[8] ROA is defined as operating income over total assets, Tobin's Q is proxied by the market to book value of assets, and monthly stock returns are adjusted for dividends and splits. These three measures are obviously correlated. For instance, higher returns are likely to be associated with higher Q ratios. Both also reflect higher realized or anticipated profitability. As a result, a positive correlation is likely to exist between the corresponding volatility measures. In this regard, Wei and Zhang (2006) show that the higher (idiosyncratic) return volatility of US firms can be explained by their greater earnings variability.

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[6] That is to identify a variation in foreign ownership unrelated to risk-taking.

[7] I thank Victoria Cano from MSCI-Barra for granting me access to this data.

[8] I also consider industry-adjusted performance and find that the results are qualitatively similar to those presented in the paper.

This way of measuring risk has the obvious drawback of collapsing the initial panel (of 15,619 firm-year observations) into a single cross section (of 1,615 firms). To explain the cross sectional difference in risk, I thus calculate the average value of the explanatory variables over the whole sample period. The association between the 3 risk measures and their determinants is estimated by OLS with standard errors corrected for heteroskedasticity.

$$\begin{aligned} RISK_i = \gamma_0 + \gamma_1 FOREIGN_i + \gamma_2 INST_i + \gamma_3 LNTA_i + \gamma_4 DEBT_i + \gamma_5 CAPEX_i \\ + \gamma_6 AGE_i + \phi \cdot IND_i + \eta_i \end{aligned} \quad (1)$$

RISK represents the standard deviation of ROA, Tobin's Q (logged) or stock returns calculated over the sample period; FOREIGN is the level of foreign ownership; INST is the ownership of domestic financial institutions; LNTA is the log of total assets; DEBT is the ratio of total debt to total assets; CAPEX is capital expenditures divided by sales; AGE is measured by the number of years since the firm's listing; IND is a vector of industry dummies based on the stock exchange's 2-digit industry classification; and η_i is the error term.

2.3. Endogeneity issues

Significant estimation bias may occur because of the endogeneity of ownership. In particular, OLS will overstate the influence of foreign ownership if foreign investors tend to invest in high-risk firms (perhaps because of their higher expected returns). On the other hand, if foreign investors choose to invest in low-risk firms (perhaps with the intention of correcting their suboptimal level of risk-taking) OLS estimates will understate their positive influence on the firm's risk-taking behavior. To address this endogeneity problem, I follow John et al. (2008), Ferreira and Matos (2008), Leuz et al. (2009), Ferreira et al. (2010) and Aggarwal et al. (2011) and use an instrumental variable approach.

My identification procedure involves two firm-level instruments. The first instrument, ADR, indicates that the firm had an active American Depository Receipt (ADR) at the beginning of the sample period (in 1998). ADRs decrease the cost of holding and trading foreign stocks for a US institution, which suggests that their issuance by Japanese firms should result in higher foreign ownership. Analyzing the structure of corporate ownership in Japan, Kang and Stulz (1997) show that ADRs are associated with higher levels of foreign ownership. More

generally, Ferreira and Matos (2008) and Aggarwal et al. (2011) indicate that ADRs are strong determinants of foreign ownership outside of the US. At the same time, existence of an ADR does not affect the firm's operations and funding structure. Hence, there is no reason to suspect that it has an effect on the firm's risk-taking. Furthermore, ADRs were typically used as a way to increase a firm's visibility in overseas product markets. Provided that this decision does not exhibit a systematic correlation with the firm's risk profile, screening based on the existence of an ADR (prior to 1998) should mitigate a possible self-selection bias.[9]

The second instrument, MSCI, indicates that the firm was a constituent of the MSCI World index at the beginning of the sample period. Ferreira and Matos (2008) and Leuz et al. (2009) show that membership in the index leads to greater investment by foreign institutions. Aggarwal et al. (2011) explain that the MSCI index is commonly used by foreign portfolio investors, but not by domestic institutions which prefer to use local stock market indexes. Hence, the MSCI variable should be highly correlated with the level of foreign ownership. As with ADR issuance, inclusion in the MSCI index should not affect a firm's policy, and especially its risk-taking behavior. For the same reason, Aggarwal et al. (2011) argue that it should not directly influence a firm's performance. More importantly, inclusion in the MSCI index is based on criteria unrelated to risk taking. Typically the decision involves the firm's market value and industry affiliation. In addition, because many Japanese firms have a similar profile (i.e., they are comparable in size and competing in the same product markets) and because only a few firms can be selected, inclusion in the MSCI index is often a close call that displays the characteristics of a randomized assignment (thus eliminating self-selection).[10]

Although the above arguments provide a strong justification for the validity of the instruments, it is also important to empirically verify that their suggested properties are actually satisfied. Regarding the requirement of significant correlation with the endogenous regressor, I follow John et al. (2008) and check the robust F-value for the joint significance of the instruments in

[9] More recently, sponsored level-III ADRs have been issued in response to strong demand by US institutions. In that case, ADR would not be a valid instrument since it might also be correlated with the possible preference of US investors for high-risk firms.

[10] For instance, Japan Airlines (JAL) was included in the MSCI World index, but not All Nippon Airways (ANA). As a result, average foreign ownership is 6.1% for JAL compared to 3.7% for ANA. Similar examples of included/non included firms are: Sony and Toshiba (electronic goods), Bridgestone and Yokohama (tires), Citizen and Seiko (precision instruments), East Japan Railways and Central Japan Railways (land transportation), Sumitomo Chemicals and Mitsui Chemicals (chemical), Kansai Power and Chubu Power (energy production), Mitsui Fudosan and Sumitomo Realty (real estate development).

explaining foreign ownership in the first-stage equation. In addition, I compute the partial R^2 which measures the fraction of the variation of risk explained by the instruments net of their effect through the (other) exogenous variables. Finally, regarding the requirement of absence of correlation with the error term, I perform Sargan/Hansen over-identification tests and verify that they are not rejected.

2.4. Unobservable firm characteristics

Another concern is that the results could stem from unobserved firm characteristics, such as managerial risk aversion, which could be due to differences in managerial horizons or demographic traits. To control for these missing variables, I use a panel regression approach with fixed firm-effects. To generate risk estimates for each year, I follow Adams et al. (2005) and define risk as the absolute deviation from the firm's expected performance.

Expected ROA and Tobin's Q (logged) are predicted with the following models including year and industry dummies:

$$\begin{aligned} \mathrm{ROA}_{i,t} = \gamma_0 + \gamma_1 \mathrm{FOREIGN}_{i,t} + \gamma_2 \mathrm{INST}_{i,t} + \gamma_3 \mathrm{LNTA}_{i,t} + \gamma_4 \mathrm{DEBT}_{i,t} + \gamma_5 \mathrm{CAPEX}_{i,t} \\ + \gamma_6 \mathrm{AGE}_{i,t} + \lambda \cdot \mathrm{YR}_t + \phi \cdot \mathrm{IND}_i + u_i + \varepsilon_{i,t} \end{aligned} \tag{2}$$

$$\begin{aligned} \ln(\mathrm{Q})_{i,t} = \gamma_0 + \gamma_1 \mathrm{FOREIGN}_{i,t} + \gamma_2 \mathrm{INST}_{i,t} + \gamma_3 \mathrm{ROA}_{i,t} + \gamma_4 \mathrm{LNTA}_{i,t} + \gamma_5 \mathrm{DEBT}_{i,t} \\ + \gamma_6 \mathrm{CAPEX}_{i,t} + \gamma_7 \mathrm{AGE}_{i,t} + \lambda \cdot \mathrm{YR}_t + \phi \cdot \mathrm{IND}_i + u_i + \varepsilon_{i,t} \end{aligned} \tag{3}$$

Consistent with Adams et al. (2005) and Cheng (2008) I include foreign and institutional ownership in the performance equations on the premise that ownership structure affects the level as well as the volatility of a firm's performance.

In equations 2-3, the error term $\varepsilon_{i,t}$ represents the unexpected component of performance. Since I am interested in the deviation from expected performance, I take the absolute value of $\varepsilon_{i,t}$ as the proxy for firm i's risk-taking at time t. This variable is then regressed on the variables appearing on the right-hand side of the Tobin's Q equation.

$$\begin{aligned} \left|\varepsilon_{i,t}\right| = \gamma_0 + \gamma_1 \mathrm{FOROWN}_{i,t} + \gamma_2 \mathrm{INST}_{i,t} + \gamma_3 \mathrm{ROA}_{i,t} + \gamma_4 \mathrm{LNTA}_{i,t} + \gamma_5 \mathrm{DEBT}_{i,t} \\ + \gamma_6 \mathrm{CAPEX}_{i,t} + \gamma_7 \mathrm{AGE}_{i,t} + \lambda \cdot \mathrm{YR}_t + v_i + \eta_{i,t} \end{aligned} \tag{4}$$

In the above equation, v_i is a fixed firm effect. Since the variables on the right-hand side are clearly persistent, I follow Petersen (2009) and estimate the equations with standard errors clustered by firm. For stock returns, the risk measure is calculated more simply by taking the standard deviation of monthly returns over the 12-month period preceding the fiscal year-end. This annual volatility is then regressed on the same determinants as in equation 4.

3. Results

3.1. Sample statistics

Table 1 presents descriptive statistics for the sample. Volatility of ROA is seen to be extremely low at less than 2.5% which underlines the aversion of Japanese companies to take risk. This figure is consistent with the results of John et al. (2008) in which Japanese firms exhibit the lowest level of cash flow volatility in a sample of 39 countries.[11] In particular, this level is several times lower than the cash flow volatility of US firms (2.1% against 9%). Consistent with Hamao et al. (2003) volatility of monthly stock returns is about 11.75% which corresponds to an annual volatility of 40.7%. This level is noticeably lower than the return volatility of US firms. In contrast to Cheng (2008) Tobin's Q is entered as a logarithm to minimize the influence of outliers.

---- Table 1 about here ----

All the variables appear to be well-behaved. Average ROA, Tobin's Q and debt/total assets are close to the figures given in Nguyen et al. (2010). On the other hand, average R&D/sales is significantly lower since I don't exclude non-R&D reporting firms. Average foreign ownership over the sample period is 8.59%. However, the involvement of foreign investors has sharply increased from 6.91% in 1998 to 12.94% in 2007. Baba (2009) reports higher ratios for a sample of larger firms (listed on the first section of the Tokyo Stock Exchange).[12] About 5.8% of firms had an ADR and 14.7% were included in the MSCI World index in 1998. Finally, the average volume of acquisitions is relatively low (0.225% of total assets) since few firms (13.3% in any given year) are active in the market for corporate acquisitions.

[11] See also Acharya et al. (2011).

[12] I also find that large firms have significantly higher foreign ownership. See Table 4 in section 3.3.

3.2. Cross-sectional regressions

Table 2 presents a cross-sectional analysis similar to Cheng (2008). The models for ROA and return volatility in Japan exhibit a similar goodness of fit as in the case of US firms. However, I obtain a much better fit for the log of Tobin's Q than if I had used Tobin's Q. For the three performance measures employed for estimating risk, foreign ownership appears to be associated with significantly higher risk. These results are broadly consistent with Ferreira and Matos (2008). In contrast, ownership by domestic institutions is associated with lower risk, suggesting that their dual role as lenders may interfere with their ability to monitor and mitigate the firm's propensity to shun risk. Concerning the other covariates, the effect of firm size is statistically significant and consistently negative which reflects the greater geographic and product diversification available to larger firms. Firm age also appears to produce a small reduction in risk taking. Consistent with Adams et al. (2005) leverage has a strong positive effect on the volatility of stock returns. In contrast Cheng (2008) finds that the leverage has no effect on the return volatility of US firms. Capital investments appear to reduce return risk, but have a negligible effect on the volatility of ROA and Tobin's Q which is consistent with the findings of Adams et al. (2005) based on US firms.

---- Table 2 about here ----

The results indicate that the impact of foreign ownership is economically significant. As a matter of fact, a one standard deviation increase in foreign ownership can be associated with a $0.0654 \times 8.91 = 0.58\%$ increase in ROA volatility. This impact is substantial in comparison with the $0.5367 \times 1.469 = 0.71\%$ decrease in ROA volatility resulting from a one standard deviation increase in firm size (the most significant covariate). As importantly, the impact of foreign ownership on ROA volatility is higher compared to the effect of a one standard deviation change in firm age (0.26%) or leverage (0.27%). Likewise, a one standard deviation increase in foreign ownership is associated with a $0.1255 \times 8.91 = 1.12$ % increase in the volatility of monthly returns. In contrast, return volatility is expected to be reduced by about 1.8% (1.6%) following a one standard deviation increase in firm size (decrease in leverage).

To provide a comparison with the effect of board size examined by Cheng (2008) a one standard deviation increase in board size can be associated with a $0.0211 \times 0.28 = 0.60\%$

decrease in ROA volatility and a 0.0396 × 0.28 = 1.13% decrease in return volatility. Thus the marginal effects appear to be surprisingly similar, but one should keep in mind that ROA and stock return volatility is several times higher in the US.

3.3. Control for endogenous selection

As in other governance studies, there are reasons to suspect reverse causality or simultaneity between the level of risk taken by Japanese firms and the investment decisions made by foreign investors. For instance, foreign investors may have a preference for high-risk firms because they are perceived to offer better investment prospects. Consequently, although foreign investors may not induce any change in business policy in the firms in which they hold stakes, OLS regressions would suggest a positive effect from foreign ownership. Alternatively, risk could be related to trade exposure to overseas markets. For example, a large proportion of sales generated in the US should be associated with higher risk because firms would face a more competitive environment and because they would be exposed to exchange rate fluctuations compared to domestic firms. At the same time, this higher overseas exposure may reduce information asymmetries and prompt greater investments from foreign investors (Kang and Stulz, 1997). This situation would also generate a positive relationship, but no causal effect stemming from foreign ownership.

As a first attempt to dispel concerns that performance variability may cause changes in foreign ownership, I follow Cheng (2008) and substitute the first observation of foreign ownership to the average ownership in the cross sectional regressions. The point estimates on foreign ownership are found to be similar but somewhat smaller. For example, the coefficient for ROA volatility is 0.0423 (compared to 0.0654) and the coefficient for return volatility is 0.0719 (compared to 0.1255). These results are not tabulated to save space. Instead, I use an instrumental variable approach. As indicated in section 2.3, the effectiveness of this approach critically depends on the availability of valid instruments. In the present case, my instruments are indicators of ADR issuance and inclusion in the MSCI World index at the beginning of the sample period. I have argued why these instruments are highly correlated with the endogenous regressor (i.e., foreign ownership) and unlikely to be correlated with the unexplained component of risk-taking (i.e., the error term in the second-stage equation).

Before presenting the instrumental variable regressions, it might be useful to examine the role played by the instruments in mitigating a possible self-selection bias in foreign ownership. To do that, I partition the sample by the level of foreign ownership (higher or lower relative to the median) and the value of the instrument (each taken one at a time). Panel A of Table 3 shows that foreign ownership is more than 10 times higher when the firm has an ADR or is a constituent of the MSCI World index. For instance, the odds of being in the high foreign ownership group are 5.4:0.4 when firms have an ADR, while firms without ADRs exhibit slightly higher odds of being in the low foreign ownership group (49.6:44.6). Tests of proportion also reveal that the percentage of firms with high foreign ownership is not equal depending on whether the firm has an ADR or not (z = 8.51) or whether the firm is a constituent of the MSCI World index or not (z = 14.05). Hence, the instruments appear to induce a highly significant cross-sectional difference in foreign ownership.

---- Table 3 about here ----

In Panel B, I tabulate the unexplained volatility of ROA (the residual of equation 1 without FOREIGN on the right-hand side) according to the value of the instrument (in rows) and the level of foreign ownership (in columns). For instrument = ADR, the unexplained volatility of ROA is clearly higher when foreign ownership is high (the difference is about 0.58%) which is consistent with the positive influence of foreign ownership shown in Table 2. But more importantly, looking at firms with high foreign ownership, the unexplained volatility of ROA is 0.575% when firms have an ADR and only 0.260% when they don't. Assuming that the effect of foreign ownership is uniform across the two groups, the difference (t-stat = 2.316) suggests that foreign investors tend to self-select into low-risk firms. This choice is reflected in the lower risk (unexplained volatility of ROA) of firms without an ADR (which might be subject to a self-selection bias) compared to firms with an ADR (which are supposed to be exogenously selected by the instrument, and thus not subject to self-selection). The difference is equally significant using the MSCI dummy (t-stat = 2.137). The instrumental variable regressions build on this observation to correct for endogenous selection. In contrast, OLS regressions are likely to underestimate the effect of foreign ownership on ROA volatility by ignoring this negative self-selection bias.

In Panel C and D, I repeat the calculations with the unexplained volatility of ln(Q) and the unexplained volatility of stock returns. Again, the level of risk is higher for firms with high

foreign ownership.[13] But for these firms, the difference according to the existence of an ADR or inclusion in the MSCI World index is not statistically significant. Hence, the results suggest that endogeneity is not a serious concern for these two risk measures. Hence, instrumental variable regressions are likely to give results that are not significantly different from the OLS results shown in section 3.2.

Table 4 presents the two-stage least-squares regressions. The first-stage indicates that ADR and MSCI are highly significant with the expected signs. In fact, foreign ownership is 3.04% higher when Japanese firms had an ADR program and 4.62% higher when they were included in the MSCI World index. Jointly, the two instruments are highly significant with a robust F-value greater than 37. The partial R^2 (5.73%) is very significant as the instruments account for a sizable proportion of total R^2 (48.43%). Consistent with Kang and Stulz (1997), the coefficients on the exogenous regressors also indicate that foreign ownership is associated with larger, more profitable, better capitalized (with a lower leverage ratio) and rapidly growing firms (as suggested by their high capital expenditures).

---- Table 4 about here ----

The second-stage results show that predicted foreign ownership is highly significant in explaining performance variability. All the coefficients are statistically significant and larger compared to the OLS estimates, particularly for ROA volatility. This finding is consistent with the view that foreign investors have targeted low-risk firms because of their inefficient (suboptimal) risk-taking with the purpose of correcting this inefficiency and improving the firm's performance. As Baba (2009) clearly shows, one way to achieve this objective is to force firms to reduce their cash reserves by increasing their dividend payouts. An alternative explanation suggested by Hamao et al. (2010) is that a significant level of foreign ownership is essential for petitions from activist funds clamoring for higher payout to be successful.

Since the number of instruments is larger than the number of endogenous variables (two instruments for one endogenous regressor) the exogeneity of the instruments can be tested

[13] The difference is about 0.054 (t = 7.97) for the unexplained volatility of ln(Q) and about 1.16% (t = 6.57) for the unexplained volatility of stock returns.

using the Sargan/Hansen J-test.[14] Here, the test indicates that the instruments are valid since the hypothesis of an absence of correlation between the instruments and the error term in the second-stage equation(s) cannot be rejected, except for the volatility of stock returns where the test is rejected at the 10% level.[15] Hence, the instruments (ADR and MSCI) can be legitimately excluded from the second-stage regressions.

Attention to the exogeneity of the instruments explains why I do not include cash holdings and dividend payout as instruments, despite indications that they determine the level of foreign ownership in Japan (Baba, 2009). Indeed, I find that foreign ownership exhibits a strong positive (negative) association with the firm's cash holdings (payout ratio) consistent with the view that foreign investors have targeted cash-rich firms.[16] However, these variables are also highly correlated with all the risk-taking measures. For instance, cash holdings contribute to a significant proportion of the cross sectional variation in risk, and hence does not qualify as a valid instrument.[17] The dummy variable indicating that the firm has granted executive stock options is also strongly correlated with foreign ownership consistent with the notion that foreigner prefer to invest in better-governed firms (Leuz et al., 2009). But although the over-identification tests suggest that it has no influence on risk taking (perhaps because the amount of options is not particularly high) I prefer not to use it as an instrument because incentives theory suggests that stock options should encourage risk taking.

Finally, I present the Durbin and Wu-Hausman endogeneity tests. In the case of ROA volatility, exogeneity of foreign ownership is strongly rejected. This is consistent with the results in Panel B of Table 3. Because foreign investors tend to select firms with low ROA volatility, OLS estimates are negatively biased. Correction for this bias leads to significantly

[14] The output is directly obtained with the command ivreg2 in Stata. Alternatively, it can be calculated by saving the error term from the second-stage regression; then regressing this error term on the excluded instruments and other control variables. The F-test for the joint significance of the instruments multiplied by the number of instruments is χ^2 distributed with 1 degree of freedom. For information, the critical values at the 10%, 5% and 1% levels are respectively 2.71, 3.84 and 6.63.

[15] But even in this case where the instruments appear to be semi-endogenous, Larcker and Rusticus (2010) show that 2SLS are still preferable to OLS because of the low correlation between the instruments and the unexplained volatility of stock returns compared to the much higher correlation between foreign ownership and stock return volatility and the very high correlation between the instruments and foreign ownership.

[16] Dahlquist and Robertsson (2001) document that foreign investors in Sweden also display a strong preference for firms with large cash positions and firms paying low dividends.

[17] Firms are likely to increase their cash holdings if they anticipate an increase in risk. Hence the positive association between cash balances at the beginning of the period and risk measured over the subsequent period.

higher 2SLS coefficients (0.1626 compared to 0.0654). In contrast, exogeneity of foreign ownership cannot be rejected for the volatility of ln(Q) and the volatility of stock returns. This is also consistent with the results indicated in Table 3 (Panel C and D). Since there does not appear to be self-selection with respect to these two risk measures, the OLS estimates should be preferred because of their greater efficiency. In any case, the estimates using 2SLS are not very different from the OLS estimates.[18]

3.4. Fixed effect regressions

To better control for unobserved firm characteristics and to provide stronger evidence of causality, I now use fixed effect regressions on measures of performance volatility calculated each year. This approach is made possible by the significant time-variation in the foreign ownership variable. Aggarwal et al. (2011) exploit a similar time variation across countries to establish the impact of foreign ownership on firm-level corporate governance and performance.[19] In contrast, most governance studies have been restricted to using random effect regressions given the highly persistent nature of most governance variables examined in the literature (e.g., managerial ownership, board size or CEO power).[20,21]

To confirm the significant time variation in foreign ownership, I start by computing the transition probabilities between ownership quartiles. The results in the upper panel of Table 5 show that foreign ownership tends to remain high in firms where it is already high. Indeed, the probably to stay in the high ownership quartile is more than 86%. Similarly, firms in the low foreign ownership quartile have a probability of more than 79% to remain in that quartile. However, the likelihood of staying in any of the two middle quartiles is only about 2/3. In fact, there is a nontrivial probability that foreign ownership increases or decreases by two quartiles

[18] I also find that using ADR or MSCI separately as instruments yields similar results.

[19] Using firm fixed effects, Nagaoka (2006) shows that foreign ownership is the only governance variable that has a consistent influence on firm value in Japan. Managerial ownership and ownership concentration are found to be significant using random firm effects, but their influence on firm valuation generally disappears when fixed effects are used.

[20] For example, Gompers et al. (2003) indicate that their anti-takeover index is relatively stable at the firm level and observe that most of the time-variation affecting the index comes from changes in the sample due to mergers, bankruptcies, and inclusion of new firms.

[21] In the absence of substantial time-variation, Zhou (2001) shows that fixed firm effects may fail to detect a relationship even when the data is known to contain one.

in the space of one year. This time variation is in sharp contrast to the relative stability of management ownership and other governance variables (Zhou, 2001; Gompers et al., 2003).

---- Table 5 about here ----

To offer a point of comparison, I repeat the same analysis for domestic institutional ownership. The results in the lower panel of Table 5 indicate that this type of ownership is more stable over time. For instance, when domestic institutions hold a relatively large stake, this stake is likely to remain high the following year (with a probability of 90.8%). The likelihood of staying in any of the two middle quartiles is also noticeably higher (by about 10%) compared to foreign ownership.

Table 6 presents the results of the fixed effect regressions. It appears that foreign ownership has a significant effect on corporate risk taking. The coefficient for the volatility of ROA is 0.0252 with a robust (clustered) t-ratio of 3.62, while for the volatility of ln(Q) the coefficient is 0.0016 with a robust (clustered) t-ratio of 3.46. In contrast, changes in institutional ownership are associated with insignificant changes in the volatility of both performance measures. For the volatility of stock returns, the effect of institutional ownership becomes significantly negative while the coefficient on foreign ownership retains its positive significance. Hence, the regressions clearly show that an increase in foreign ownership can be linked to a significant increase in performance volatility just as an increase in firm size can be linked to a significant decrease in performance volatility. Interestingly, further results (not tabulated) suggest that the effect of foreign ownership on risk is symmetric. Increases and decreases of foreign ownership lead to increases or decreases in risk of similar magnitude.

---- Table 6 about here ----

3.5 Ex ante measures of risk

As a final point, I provide results for three ex-ante measures of risk taking: R&D intensity, advertising expenditures, and acquisitions. Kothari et al. (2002) argue that R&D expenses correspond to investments in high-risk projects. As a matter of fact, the rationale for the expensing of R&D investments (rather than their capitalization) is to reflect their highly uncertain payoffs. According to Cheng (2008) this explains why firms with larger boards,

which tend to be more risk averse, are characterized by lower R&D expenditures. Likewise, Coles et al. (2006) relate increases in R&D expenditures to managerial incentives to take risk through the sensitivity of CEO wealth to stock volatility.

In line with Chan et al. (2001) R&D expenditures is scaled by total sales over the same period. Because their payoffs also present a high degree of uncertainty, I use advertising expenditures scaled by total sales as an indicator of high-risk investments. Like Cheng (2008) I include the amount of acquisitions scaled by total assets as a third risk measure. To mitigate their large positive skewness and kurtosis, I increment the three ratios by one and take their natural logarithm. The regressions involving these ex-ante measures of risk include the same control variables as in section 3.4 and are estimated using fixed firm effects. Because of these fixed firm effects, within-firm variation can be positive as well as negative (unlike the ratios which are bounded below at zero).

---- Table 7 about here ----

The regression results are reported in Table 7. For all the risk-taking measures, the effect of foreign ownership is positive and statistically significant. In contrast, the effect of institutional ownership is either negative or insignificant, which confirms the results based on performance volatility. Cross-sectional regressions using random effect Tobit (not tabulated) reveal a similarly positive effect from foreign ownership. Hence, foreign investors appear not only to be associated with more high-risk investments, but increases in their shareholdings can also be linked to significant increases in all categories of risky investments. Inspection of the other covariates shows that increases in firm size are associated with higher acquisition activity which echoes the greater involvement of large firms in acquisitions shown in cross-sectional regressions. On the other hand, increases in firm size are not associated with higher R&D although large Japanese firms tend to exhibit a higher R&D intensity (Okada, 2005; Nagaoka, 2006; Nguyen et al., 2010). Surprisingly, both R&D and advertising expenditures appear to decrease with an increase in a firm's profitability. This is because increases in profitability stem from higher sales which mechanically decrease R&D and advertising intensities. David et al. (2006) document a similar effect. Finally, the positive coefficient on firm age appears to pick up the strong increase in all these categories of risky investments over the sample period (in cross-sectional regressions, the effect of firm age happens to be negative).

4. Conclusion

Several stylized facts distinguish Japanese firms in cross-country studies. One of them is their extremely high level of liquid assets. For instance, Dittmar et al. (2003) show that corporate cash reserves in Japan is twice as large as in other countries. This precautionary behavior is consistent with a high degree of risk aversion. In fact, Japanese firms exhibit the lowest cash flow volatility in the sample analyzed by John et al. (2008). Hence, the growing involvement of foreign investors, and particularly US institutional investors, is likely to have induced a significant change in their business policies. In line with this argument, Ahmadjian and Robbins (2005) observe a significant increase in restructuring while Baba (2009) finds that Japanese firms have increased their dividends following increases in foreign ownership. Hamao et al. (2010) suggest that the reason why foreign investors wield a disproportionate influence on Japanese firms is because they facilitate the actions of activist funds. A more critical factor seems to be that foreign investors are less likely to be hindered by business ties with local firms unlike domestic institutions (Chen et al., 2007; Ferreira and Matos, 2008; Aggarwal et al., 2011).

In this paper, I have hypothesized that foreign investors have also prompted Japanese firms to increase their risk taking. The empirical results based on a large sample of firms listed over the period 1998-2007 overwhelmingly support this hypothesis. All the risk-taking proxies represented by ROA, Tobin's Q and stock return volatility increase with the level of foreign ownership. The estimates are not only statistically significant, but their magnitude is comparable to the effect of firm size and leverage, which are well-known for their potential to reduce or increase risk.

After controlling for the endogeneity of ownership, the influence of foreign investors is found to be even stronger, especially for ROA volatility. I explain this outcome by the fact that foreign investors have targeted low-risk firms with the objective of mitigating the factors responsible for their excessive level of risk aversion. Consistent with this view, Baba (2009) indicates that foreign investors tend to select cash-rich firms (with the aim of extracting their excess cash) which should also display a lower risk profile. Further analysis using fixed firm effect regressions show that increases in foreign ownership are associated with increases in all the indicators of performance volatility. Several ex-ante measures of risk, such as R&D intensity and acquisitions, are also found to increase with an increase in foreign ownership.

Hence, whilst they have publicly and forcefully resisted the pressure of foreign investors, Japanese firms appear to have been influenced by the presence of the latter in their ownership structure. Overall this result supports the idea that foreign ownership matters. By affecting critical decisions, such as the degree of risk a firm should take, foreign investors also seem to have the power to affect firm performance. This outcome is consistent with the recent literature documenting the strong influence of foreign investors outside of the US.

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Table 1:
Descriptive statistics for the sample

Variables	Mean	Std dev	Pctile 25	Median	Pctile 75
Panel A: Cross-sectional data (N = 1,615 firm observations)					
Standard deviation of performance					
ROA (in %)	2.469	2.116	1.20	1.91	3.00
Ln(Q)	0.205	0.163	0.10	0.16	0.26
Stock return (in %)	11.754	4.474	8.83	11.01	13.61
Average firm characteristics and instrumental variables					
Foreign ownership (in %)	8.590	8.910	2.07	5.55	12.34
Institutional ownership (in %)	27.702	13.570	16.79	26.34	37.73
ROA (in %)	4.766	3.978	2.45	4.11	6.40
Tobin's Q	1.293	1.170	0.93	1.08	1.29
Ln(total assets)	11.339	1.469	10.33	11.12	12.15
Total debt/Total assets	0.247	0.180	0.09	0.23	0.37
Capex/sales	0.049	0.066	0.02	0.04	0.06
Firm age	30.81	19.07	9.5	39.5	47.5
ADR (dummy) in 1998	0.058	0.234	0	0	0
MSCI (dummy) in 1998	0.147	0.354	0	0	0
Panel B: Time series cross-sectional data (N = 15,619 firm-year observations)					
Absolute deviation from predicted performance					
ROA (in %)	1.728	2.199	0.50	1.12	2.17
Ln(Q)	0.131	0.164	0.04	0.09	0.16
Return volatility (in %)	10.710	6.589	6.51	9.22	13.14
Ex ante measures of risk					
R&D/sales (in %)	1.842	8.167	0	0.56	2.44
Advertising/ sales (in %)	0.539	1.795	0	0	0.27
Acquisitions/total assets (in %)	0.225	3.234	0	0	0
Acquisition dummy	0.133	0.340	0	0	0

The sample consists of 1,615 firms listed on the Tokyo Stock Exchange over the period 1998-2007. In Panel A, standard deviation of performance is calculated over the 10-year sample period. ROA is operating income over total assets. Tobin's Q is the market to book value of assets. Returns are calculated monthly and adjusted for dividends and stock splits. Firm age is the number of years since the firm's listing. ADR indicates that the firm had an American Depository Receipt in 1998. MSCI indicates membership in the MSCI World index in 1998. In Panel B, absolute deviation from predicted performance is described in equations 2-4. Return volatility is calculated over the 12-month period preceding the firm's accounting year-end.

Table 2
Cross-sectional regressions of performance volatility on foreign ownership

	Standard deviation of performance measure using		
	ROA	Ln(Q)	Stock return
FOREIGN	0.0654 ***	0.0057 ***	0.1255 ***
	(6.29)	(7.60)	(6.86)
INST	-0.0132 ***	-0.0006 *	-0.0480 ***
	(-2.99)	(-1.67)	(-5.16)
ROA	-0.0331	0.0011	-0.1610 ***
	(-0.68)	(0.42)	(-3.33)
LNTA	-0.4847 ***	-0.0293 ***	-1.2282 ***
	(-7.60)	(-6.15)	(-10.19)
DEBT	1.5083 ***	-0.0702 ***	8.8115 ***
	(4.74)	(-3.18)	(14.22)
CAPEX	-0.5316	0.1558 **	-6.3399 ***
	(-0.63)	(2.04)	(-4.83)
AGE	-0.0138 ***	-0.0004	0.0145 *
	(-3.07)	(-1.51)	(1.91)
Fixed effects	industry	industry	industry
F value	14.35 ***	21.00 ***	31.41 ***
R^2	0.2692	0.3318	0.3870

The sample consists of 1,615 firms listed on the Tokyo Stock Exchange over the period 1998-2007. Performance variability is calculated over the 10-year sample period. ROA is operating income over total assets. Ln(Q) is the log of market to book value of assets. Stock returns are adjusted for dividends and stock splits. All the explanatory variables are averaged over the sample period. FOREIGN is the percentage of shares owned by foreign investors. INST is the percentage of shares owned by domestic financial institutions. LNTA is the log of total assets. DEBT is total debt over total assets. CAPEX is capital expenditures over sales. AGE is the number of years since the firm's listing. All regressions include industry dummies using the Tokyo Stock Exchange's industry classification. Standard errors are corrected for heteroskedasticity. ***, **, * indicate significance at the 1%, 5%, and 10% level.

Table 3:
Analysis by level of foreign ownership and instrument value

	instrument = ADR (1998)		instrument = MSCI (1998)	
	FOREIGN = low	= high	FOREIGN = low	= high
Panel A: Distribution of firms				
instrument = 1	0.004	0.054	0.012	0.136
instrument = 0	0.496	0.446	0.489	0.364
Panel B: Unexplained volatility of ROA				
instrument = 1	-0.196	0.575	0.156	0.487
instrument = 0	-0.294	0.260	-0.304	0.222
test of difference		2.316 **		2.137 **
Panel C: Unexplained volatility of Ln(Q)				
instrument = 1	-0.012	0.024	0.049	0.023
instrument = 0	-0.027	0.027	-0.029	0.029
test of difference		-0.277		-0.647
Panel D: Unexplained volatility of stock returns				
instrument = 1	-2.199	0.351	-0.844	0.626
instrument = 0	-0.566	0.609	-0.574	0.564
test of difference		-0.914		0.281

The sample consists of 1,615 firms listed on the Tokyo Stock Exchange over the period 1998-2007. FOREIGN = high (= low) if foreign ownership is above (below) the sample's median. Instrument refers to the ADR dummy for columns 2-3 and to the MSCI dummy for columns 4-5. In Panel A, the equality of proportion of high foreign ownership across values of the instrument is rejected for both ADR ($z = 8.51$) and MSCI ($z = 14.05$). In Panels B-D, the unexplained volatility of performance is the residual of the cross-sectional regressions without foreign ownership (i.e. Equation 1 without the FOREIGN variable). The test of difference in unexplained performance volatility across values of the instrument is only indicated for FOREIGN = high. ** indicates significance at the 5% level.

Table 4:
Cross-sectional regressions with instrumented foreign ownership

	1st stage:	2nd stage: standard deviation of performance		
	FOREIGN	ROA	Ln(Q)	Return
Predicted FOREIGN		0.1626***	0.0083***	0.1506***
		(5.15)	(3.63)	(2.81)
ADR (in 1998)	3.0392***			
	(3.19)			
MSCI (in 1998)	4.6175***			
	(6.80)			
INST	0.0515***	-0.0194***	-0.0008**	-0.0496***
	(2.79)	(-4.04)	(-2.00)	(-5.14)
ROA	0.4859***	-0.0815	-0.0001	-0.1735***
	(6.72)	(-1.63)	(-0.05)	(-3.08)
LNTA	2.3368***	-0.7903***	-0.0372***	-1.3070***
	(11.40)	(-6.24)	(-4.21)	(-5.90)
DEBT	-8.8917***	2.4030***	-0.0471	9.0425***
	(-7.32)	(5.57)	(-1.55)	(11.68)
CAPEX	15.0883***	-1.9932**	0.1179	-6.7172***
	(2.77)	(-1.98)	(1.41)	(-4.63)
AGE	-0.0437***	-0.0104**	-0.0004	0.0153**
	(-3.20)	(-2.40)	(-1.25)	(2.01)
Fixed effects	industry	industry	industry	industry
F-test instruments	37.71***			
Partial R^2	0.0573			
Sargan χ^2		0.058	0.525	3.43*
p-value		0.8092	0.4686	0.064
Durbin χ^2		14.019***	1.481	0.261
Wu-Hausman F-stat		13.914***	1.463	0.255
F value	31.17***	11.13***	18.00***	31.49***
R^2	0.4843	0.1776	0.3214	0.3857

The sample consists of 1,615 firms listed on the Tokyo Stock Exchange over the period 1998-2007. Performance variability is calculated over the whole sample period. ROA is operating income over total assets. Ln(Q) is the log of market to book value of assets. Stock returns are adjusted for dividends and stock splits. All the explanatory variables are averaged over the sample period. FOREIGN is the percentage of shares owned by foreign investors. INST is the percentage of shares owned by domestic financial institutions. LNTA is the log of total assets. DEBT is total debt over total assets. CAPEX is capital expenditures over sales. AGE is the number of years since the firm's listing. ADR indicates that the firm had an ADR in 1998. MSCI indicates that the firm was a constituent of the MSCI World index in 1998. All regressions include industry dummies using the Tokyo Stock Exchange's industry classification. Standard errors are corrected for heteroskedasticity. The Sargan χ^2 statistic tests the hypothesis that the instruments (ADR and MSCI) are uncorrelated with the unexplained variability in firm performance. The Durbin χ^2 and Wu-Hausman F-statistics test the hypothesis that FOREIGN is exogenous. ***, **, * indicate significance at the 1%, 5%, and 10% level.

Table 5:
Transition probabilities between quartiles of foreign and institutional ownership

	Foreign ownership quartile (year N+1)			
	Low = 1	2	3	High = 4
Foreign ownership quartile (year N)				
Low = 1	79.2	17.2	2.7	0.8
2	16.9	65.8	15.9	1.4
3	1.2	16.7	68.3	13.8
High = 4	0.1	0.8	13.2	86.0

	Institutional ownership quartile (year N+1)			
	Low = 1	2	3	High = 4
Institutional ownership quartile (year N)				
Low = 1	83.9	15.0	1.0	0.2
2	7.6	76.2	15.6	0.6
3	0.5	9.0	77.7	12.8
High = 4	0.1	0.3	8.8	90.8

The sample consists of 15,619 firm-year observations from 1998 to 2007.

Table 6:
Fixed-effect regressions of performance volatility on foreign ownership

	Absolute deviation from predicted performance		12-month stock return volatility
	ROA	Ln(Q)	
FOREIGN	0.0252 ***	0.0016 ***	0.0465 ***
	(3.62)	(3.46)	(3.23)
INST	0.0050	-0.0005	-0.0289 **
	(1.07)	(-1.44)	(-2.47)
ROA	-0.1012 ***	0.0029 ***	0.0289
	(-4.68)	(3.02)	(1.11)
LNTA	-0.9953 ***	-0.1124 ***	-1.4676 ***
	(-4.45)	(-8.62)	(-3.34)
DEBT	-0.5869	0.0204	6.7684 ***
	(-1.34)	(0.55)	(4.52)
CAPEX	0.6749 **	0.0673 **	-3.8512 ***
	(2.03)	(2.29)	(-2.98)
AGE	0.0305 ***	-0.0013 *	-0.7955 ***
	(2.98)	(-1.91)	(-26.46)
Fixed effects	firm/year	firm/year	firm/year
F value	15.22 ***	32.98 ***	32.64 ***
R^2	0.5209	0.4272	0.4753

Predicted performance is described in equations 2-3. Absolute deviation from predicted performance is the absolute value of the residual excluding firm effects described in equation 4. ROA is operating income over total assets. Q is the market to book value of assets. Return volatility is calculated using 12 monthly returns. FOREIGN is the percentage of shares owned by foreign investors. INST is the percentage of shares owned by domestic financial institutions. LNTA is the log of total assets. DEBT is total debt over total assets. CAPEX is capital expenditures over sales. AGE is the number of years since the firm's listing. The sample consists of 15,619 firm-year observations. The equations are estimated using OLS with fixed firm and year effects and standard errors clustered by firm. ***, **, * indicate significance at 1%, 5%, and 10%.

Table 7:
Fixed-effect regressions with three ex-ante measures of risk

	R&D expenses/sales	Advertising expenses/sales	Acquisitions /total assets
FOREIGN	0.0119 ***	0.0032 ***	0.0265 ***
	(2.85)	(3.01)	(4.58)
INST	0.0001	-0.0004	-0.0095 **
	(0.03)	(-0.52)	(-2.13)
ROA	-0.0497 ***	-0.0100 ***	0.0085
	(-8.65)	(-6.28)	(1.35)
LNTA	-0.0517	-0.0636 ***	0.5028 ***
	(-0.59)	(-3.02)	(4.13)
DEBT	-0.7531 ***	0.1306 **	-0.3418
	(-3.28)	(2.15)	(-1.11)
CAPEX	-0.0405	-0.0669	0.3732
	(-0.21)	(-0.99)	(1.09)
AGE	0.0628 ***	0.0289 ***	0.0918 ***
	(8.77)	(14.88)	(10.45)
Fixed effects	firm/year	firm/year	firm/year
F value	20.82 ***	32.07 ***	29.59 ***
R^2	0.8946	0.7069	0.3638

The dependent variables R&D/sales, Advertising/sales and Acquisitions/total assets are incremented by one and logged to mitigate the influence of outliers. FOREIGN is the percentage of shares owned by foreign investors. INST is the percentage of shares owned by domestic financial institutions. ROA is operating income over total assets. LNTA is the log of total assets. DEBT is total debt over total assets. CAPEX is capital expenditures over sales. AGE is the number of years since the firm's listing. The equations are estimated using OLS with fixed firm and year effects and standard errors clustered by firm. The sample consists of 15,619 firm-year observations. ***, **, * indicate significance at 1%, 5% and 10%.