The Effects of Institutional Ownership on Diversified Firms

Abstract

The percentage of institutional ownership as well as the number of firms with global segments has increased over the period of 1998 through 2011. In this paper, I examine the link between institutional ownership (stability, proportion and persistence) and firms' diversification strategy, risk exposure and excess value. First, I show firms with higher institutional ownership stability, proportion and persistence are more diversified, have a closer Beta to the market and a lower idiosyncratic risk, and higher excess value. Next, I use probit and ordinal probit regressions to confirm that stability, proportion and persistence of institutional owners augment the probability of diversification. Lastly, I employ dynamic panel GMM to account for the endogeneity of institutional ownership and diversification discount; I find industrial diversification decreases the persistence of institutional owners whereas global diversification increases this factor. Results also indicate that institutional ownership stability, proportion and persistence are positively and idiosyncratic risk is negatively associated with excess value.

JEL Classification: G12; G14; G30; G32

Keywords: Institutional Ownership; Corporate diversification; Firm value; Idiosyncratic risk

1. Introduction

Institutions have become leading players in the financial markets. Mutual funds, hedge funds, pension funds, banks and insurance companies are the primary owners of U.S. corporations (Gillan and Starks, 2000), where their equity ownership in U.S. has increased from approximately 35% in 1980 to nearly 60% in 2000 (Clay, 2002) and reached 67% at the end of 2010 (Blume and Keim, 2012).

Given that institutions are the largest holders of stock, their ownership has several advantages for investee; having a high stake in a firm gives large shareholders incentive to monitor managers (Shleifer and Vishny, 1986), which upturns firm's efficiency and performance. Moreover, institutions are better informed compared to individuals, institutional trading reveals information and impact stock prices (Easley and O'Hara, 1987; Kyle, 1995). Knowing this, analysts increase their coverage and traders pay close attention to firms, in which their shares are held by institutions. As Clay (2002) points out, an increase in demand of stocks that are held by institutions may increase the price of these stocks above the expected value (present value of future cash flows).

My first objective is to examine the relationship between institutional ownership and firm diversification strategy. Despite the importance of firm diversification profile as a deciding factor for institutional investors, literature in this area is limited and offers mixed results. On one hand, Tihanyi, Johnson, Hoskisson, and Hitt (2003) support the importance of firm's diversification strategy by finding a significant relationship between institutional ownership and global diversification. On the other hand, Denis et al. (1997) find that diversification is negatively related to the equity ownership of large outside blockholders. Doukas and Pantzalis

(2003) also document that firm's degree of foreign involvement aggravate agency costs because "geographic diversity renders active monitoring more difficult and expensive in comparison to domestic firms" (p. 59).

My second objective in this study is to investigate the impact of institutional owners on firm value. While the proportion of institutional ownership has received attention (Morck, Shliefer and Vishny, 1986; McConnell and Servaes, 1990; Wright, Ferris, Sarin, and Awasthi, 1996; Holderness, Kroszner and Sheehan, 1999; Woidtke, 2002; and Cornett et al., 2007), stability of institutional ownership has been largely neglected in the literature. Elyasiani et al. (2010) emphasize on the influence of institutional ownership stability, in addition to ownership proportion. First, stable institutional investors have more incentives to learn more about their investee and monitor them routinely, which in turn alleviate information asymmetry and agency costs. Second, long-term institutional owner are more likely to support managers to engage in longer-term investment, leading to better long-term performance (Jensen and Meckling, 1976). They also help their investee to attract Wall Street coverage, which increases the demand for stock and improves liquidity and prices. Third, stable institutional owners, especially those with large holdings, direct managers to align their interests with shareholders, mitigate opportunistic earning management and focus on long-term profitability instead of opportunistic earning management (Hartzell and Starks, 2003) in addition to increase in the proportion of independent directors (Gallagher et al., 2007), in order to aggravate corporate governance. As Ruiz-Mallorquí and Santana-Martín (2011) summarize: "dominant shareholders typically have large shareholdings that are stable over time, which gives them both the incentive and the ability to positively influence the firm's governance and in turn performance" (p. 118).

My final objective is to examine the impact of institutional ownership and firm risk exposure on firm value in a multivariate framework. In addition, I account for the endogeneity of diversification decision (Campa and Kedia, 2002; Villalonga, 2004a) and institutional ownership (Cornett et al., 2007). Therefore, I estimate a dynamic panel GMM to address the endogeneity of both variables. The impact of diversification on firm value is one of the most debated topics in Corporate Finance. While several studies suggest that corporate diversification discounts firm value (Lang and Stulz, 1993; Berger and Ofek, 1995; Comment and Jarrell, 1995; Servaes, 1996, Kim and Mathur, 2008; Hoechle et al., 2012), other studies refute diversification discount after controlling for the endogeneity of diversification decision and suggested that diversification increase firm value (Campa and Kedia, 2002; Villalonga, 2004a, Villalonga, 2004b; Gande et al., 2009; He, 2012). To date, there is no consensus in the literature as a plausible explanation for diversification discount or premium. Chen and Ho (2000) blame agency problems as the underlying factor behind value–reducing diversification. Hoechle et al. (2012) find that the magnitude of "diversification discount" is reduced under better corporate governance. Considering that institutional ownership aggravates corporate governance (Hartzell and Starks, 2003; Gallagher et al., 2007), increase in proportion, stability and persistence of institutional ownership should mitigate agency costs associated with diversification and therefore, have a positive impact on diversified firms' value.

This paper differs from previous studies in several ways: State of the art on the relationship between institutional ownership and firm value only highlights the effect of institutional ownership proportion. Elyasiani et al. (2010) suggest that the stability of institutional ownership is more important than the level of institutional ownership commonly in the literature. Consequently, I extend the literature by following their methodology to measure institutional

ownership stability, proportion and persistence. Moreover, unlike previous studies, which use Tobin Q, I calculate firm value according to Berger and Ofek (1995). Furthermore, I measure firm diversification profile using the number of business and geographic segments as well as industrial and global Herfindahl index. Lastly, I calculate firm's idiosyncratic risk as the standard deviation of residuals of the modified version of Fama and French 3- factor model.

A preview of results suggests that the number of focused (domestic single-segment) and industrially-diversified (domestic multi-segment) firms has declined every year from 1998 through 2011, whereas, the number of global single-segment and globally-diversified (global multi-segment) firms has increased (Figure 1). Global markets are becoming more integrated, therefore, firms are becoming more interested to have presence and compete at the international level. Moreover, multi-segment (diversified) firms have significantly higher institutional ownership stability, proportion and persistence compared to their single-Segment (focused) counterparts. In addition, multi-segment (diversified) firms benefit from having almost the same risk exposure as the market with a significantly lower idiosyncratic risk. Higher ownership stability, proportion and persistence of global (single and multi-segment) firms also suggest that institutions seem to have preference towards firms with international exposure.

Institutional ownership stability, proportion and persistence homogenously increase as firms become more diversified, which shows the preference of institutions towards diversified firms are twofold; first, one can say that institutions tend to invest in diversified firms and stay with these firms for a longer period. Second, institutions direct managers to diversify firm' portfolio with the goal of reaching market beta and circumventing idiosyncratic risk. These results are robust even after disentangling the institutional ownership stability and proportion (Tables 4, 5, 6 and 7).

Furthermore, I employ Probit and Ordinal Probit regressions to confirm the univariate results. Multivariate analyses also show consistent results that volatility (stability) of institutional ownership significantly decreases (increases) the probability of diversification, while their ownership proportion significantly increase the likelihood of diversification (Table 8). Similarly, persistence of institutional owners, which is a combination of stability and proportion, has a significant positive association with the probability of diversification.

Lastly, I address the endogeneity of diversification decision and institutional ownership with dynamic panels GMM. Institutional ownership persistence inclines with global diversification and declines with industrial diversification (Table 10). In addition, the stability of institutional owners is more important that their proportion in assessing firm excess value (Table 11).

The remainder of the paper proceeds as follows. Section 2 describes the data. Section 3 explains the process of constructing variables. Section 4 explains the methodology. Section 5 presents the univariate and multivariate results. Section 6 addresses the endogeneity issues with dynamic panels. Section 7 concludes.

2. Data

I compile the sample over the period 1998 through 2011[1]. Institutional ownership and stock returns (#shares outstanding) data are obtained from Thomson Financial and CRSP respectively. Firm characteristics (diversification) are obtained from the Industrial and Geographic Segment data in COMPUSTAT. Financial and utility firms (primary SIC codes 6000–6999 and 4900–4999), and Foreign incorporated firms are excluded from the sample. Pursuant to Berger and

[1] Prior to 1998, Statement of Financial Accounting Standards (SFAS) No.131 might have reported firms with multiple related business lines (diversified) as single-segment firms by using industry codes to classify business segments. SFAS 14 is introduced in 1997 to revise the shortcomings of SFAS 131. Hence, post 1998 data classify business segments based upon their contributions to the firm revenues and expenses.

Ofek (1995) and Denis et al. (2002), firm-years where the total sales are less than $20 million and/or the difference between the sum of the segment sales and total firm sales is greater than 1% are also removed.

3. Variable Construction

Institutional Ownership Stability

Institutional ownership stability measures are constructed according to Elyasiani *et al.* (2010). First, institutional ownership volatility (IOV_i) is measured as the average standard deviation of institutional shareholding proportions across all investors in firm over a 5-year period (20 quarters):

$$IOV_i = \sum_{j=1}^{J_i} Std(F_{j,t}^i)/J_i \quad (1)$$

where $F_{j,t}^i$ is the investment proportion of investor *j* in firm *i* at quarter *t* (*t* = 1, 2, …, 20), and J_i is the number of institutional investors in firm *i*. Stable institutional owners have lower ownership volatility (IOV_i). Next, aggregate ownership proportion ($PROP_i$) of the firm *i* over a 5-year period (20 quarters) is included to control for the effect of institutional ownership level on diversification and firm value:

$$PROP_i = \left(\sum_{t=1}^{20} \sum_{j=1}^{J_i} F_{j,t}^i \right) /20 \quad (2)$$

Finally, institutional ownership persistence (IOP_i) is calculated as the ratio of the aggregate ownership proportion of each institution to the standard deviation of its ownership proportion over a 5-year period (20 quarters):

$$IOP_i = \frac{PROP_i}{IOV_i} \quad (3)$$

where *PROP* and IOV_i are the institutional ownership proportion and volatility, respectively, as defined earlier. Firms with large and stable institutional owners have higher institutional ownership persistence (IOP_i).

Descriptive statistics for institutional ownership stability, proportion and persistence are reported in Table 2, Panel A. Institutional ownership volatility (IOV) is, on average, 0.68% with a maximum of 18.75%. The proportion of institutional ownership (*PROP*) for the sample averages about 34.61%. Minimum of 0% and maximum of 99.68% also suggest that some firms have no institutional owners while others are almost entirely owned by institutions. Institutional ownership persistence (*IOP*) has a unit less mean of 151.95. In Table 3, Panel A, a higher institutional ownership volatility for focused firms (0.725%) compare to diversified firms (0.647%) indicate that diversified firms have more stable institutional owners. Similarly, industrial and global diversification decreases the volatility of institutional owners and the combination of both types of diversification has the highest (lowest) level of stability (volatility). Moreover, institutions have an average ownership proportion of 29.963% in focused firms and 37.387% in diversified firms. Similarly, Panel B also show that both DS and GS firms have higher proportion of institutional owners compare to DS firms and GM firms have the highest proportion of institutional ownership (42.187%). Furthermore, institutional ownership persistence (*IOP)* is significantly greater for multi-segment firms (173.877) compare to their single-segment counterparts (115.276). This persistence also increases homogenously as firms increase their degree of diversification and integrate in global markets. These results suggest that there is a strong causality between institutional ownership and diversification; institutions

prefer diversified firms and thus, they either invest in diversified (preferably globally-diversified) firms or they direct managers to engage in activities that increase firm diversification profile.

Firm Value

Excess value is calculated according to Berger and Ofek (1995), as the natural logarithm of the ratio of firm's actual value (market value of equity plus book value of debt) to its hypothetical imputed value, where the imputed segment value is segment sales multiply by the median market value to sales ratio of single-segment domestic firms in the same industry.

$$EV = \ln\left(\frac{V}{I(V)}\right) \qquad (6)$$

$$I(V) = \sum_{i=1}^{n} S_i * Ind_i \left(\frac{V}{S}\right)_{mf} \qquad (7)$$

where, *I(V)* is the imputed value of the sum of segments as if they were separate entities. S_i is the segment *i*'s total sales, $Ind_i \left(\frac{V}{S}\right)_{mf}$ is the multiple of total capital to total sales for the median single-segment firm in segment *i*. The calculated excess values are winsorized at the 5% level to remove extreme observations. [2]

Corporate Diversification Strategies

I use two different measures of firm diversification, number of segments and Herfindahl index. First, firms with more than one business segment are classified as industrially diversified and firms with sales from more than one geographic segment as globally diversified (Denis et al., 2002). Table 1 reports the sample distribution. The sample includes 4,668 firms and 21,477 firm-year observations. Focused (domestic single-segment (DS)) firms have only one business

[2] Before the winsorization, observations with "extreme" excess values are deleted, whereby actual firm value is either more than four times or less than one-fourth the imputed value (Denis et al. (2002)).

segment consisting 33.10% of the sample (8,036 firm-year observations), which serve as the benchmark. Firms that are only industrially diversified (domestic multi-segment domestic (DM)) represent 19.54% of the full sample (3,309 firm-year observations). Firms that are only globally diversified (global single-segment global (GS)) account for 20.31% of the whole sample (5,663 firm-year observations). Firms that are both industrially and globally diversified (global multi-segment global (GM)) represent 27.06% of the sample with 4,469 firm-year observation. Additionally, I calculate the sales-based Herfindahl index for firm *i* in year *t* to proxy for firm diversification:

$$HERF_{i,t} = \sum \left(\frac{SSales_{it}}{FSales_{it}}\right)^2 \quad (4)$$

where $SSales_{it}$ denote the segment sales (from an industrial segment or from a geographic segment) for the firm *i* in year *t*. $FSales_{it}$ is the firm's total sales across all reported segments in that year. Industrial-segment sales based Herfindahl Index (*I-HERF*) and geographic-segment sales based Herfindahl Index (*G-HERF*) are reported separately. Herfindahl index is between 0 and 1; the Herfindahl Index is equal to 1 for domestic single-segment firms (DS) and less than 1 for multiple-segment firms (DM, GS and GM).

Descriptive statistics for diversification measures are reported in Panel B of Table2. Overall, sample firms have, on average, 1.647 business and 2.174 geographic segments. Maximum number of business segments and geographic segments are 8 and 23, respectively. Table 3 reports the descriptive statistics for different types of diversification. Table 3, Panel A shows that, on average, diversified (multi-segment) firms have 2.105 business segments, 3.011 geographic segments, 0.758 *I-HERF* and 0.683 *G-HERF*. DM firms have 2.665 business segments while GS firms 3.378 geographic segments. GM firms have 2.879 business segments

and 3.628 geographic segments. GM firms have more business segments than DM and more geographical segments than GS firms, respectively. DS firms have both Herfindahl indices (*I-HERF* and *G-HERF*) equal to one since that they are not diversified. DM firms have business sales-based Herfindahl index equal to 0.63 and geographic sales-based Herfindahl index equal to 1, which shows that these firms are not operating in foreign countries. GS firms, on the other hand, have business sales-based Herfindahl index equal to 1 and geographic sales-based Herfindahl index equal to 0.575. GM firms have business and geographic sales-based Herfindahl index equal to 0.546 and 0.586, respectively.

Firm Risk

The two measures of risk in this study are U.S. market risk (Market Beta) and idiosyncratic risk, to capture firm's systematic and unsystematic risk, respectively. While several studies use only excess returns of U.S. market in a one-factor model to estimate diversified firms' risks (Brewer, 1981; Shaked, 1986; Amit and Livant, 1988; Reeb et al., 1998; Kwok and Reeb, 2000; Best et al., 2004) estimate diversified firms' risks using the one-factor market model, I follow Stulz (1999)' suggestion and control for the global market factor should in estimating the expected returns of globally-diversified firms. Aggarwal and Harper (2010) show that domestic firms also bear a significant exchange rate exposure. Therefore, I incorporate the excess returns on the MSCI World Index (excluding U.S.) in the model to capture the risk exposure of domestic firms in an integrated global market.

I use the modified Fama-French 3-factor model to extract the Market Beta and idiosyncratic risk of each firm in the sample as follows:

$$\left(R_{it} - R_{ft}\right) = \alpha + \beta_1\left(R_{mt} - R_{ft}\right) + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 WMkt_t + \varepsilon_{it} \quad (5)$$

where $(R_{it} - R_{ft})$ is the firm *i* daily excess return; $(R_{mt} - R_{ft})$ is the daily excess return on the market; SMB_t is the daily excess return of the small-stock portfolio over the big-stock portfolio; HML_t is the daily excess return of the high-book-to-market portfolio over the low book-to-market portfolio. $WMkt_t$ is the difference between the returns on the MSCI World index excluding U.S. index on day *t* and the risk–free rate in the U.S. market. I retrieved the factors from Professor Kenneth French data library[3].

I estimate the above model by firm and by year to merge with COMPUSTAT database. The coefficient of interest is β_1 , which captures the firm exposure to the U.S. market. Then, I estimate the daily idiosyncratic risk as the standard deviation of residuals for each firm. The annualized idiosyncratic risk is calculated as the product of the daily idiosyncratic risk and the square root of the number of trading days in a year ($\sqrt{250}$).

4. Methodology

4.1. Univariate Analyses

In this section, I test the relationship between the institutional ownership and firm excess value. Following Elyasiani *et al.* (2010), I disentangle the possible impact of institutional ownership stability (*IOV*) from that of institutional ownership proportion (*PROP*). Hence, I break down the sample into quintiles of institutional ownership proportion, where each quintile of proportion is further divided into five groups based on institutional ownership stability. The sample is also disaggregated into quintiles of institutional ownership persistence (*IOP*). I repeat this analysis for risk measures and diversification profile to test how these measures change based on the stability, proportion and persistence of institutional owners. The traditional t-test

[3] http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

and the non-parametric Wilcoxon rank sum test are employed to test for the significance of the differences between the highest and the lowest quintiles.

4.2. Multivariate Analyses

4.2.1. Probit and Ordinal Probit Regressions

In this section, I estimate the impact of institutional ownership stability, proportion and persistence on firm's diversification decision (*DIVD*). First, I employ probit and ordinal probit regressions to estimate Equation 8. In the probit regression, the dependent variable (*DIVD*) is equal to 1 for diversified (DM, GS and GM) firms and 0 for focused (DS) firms as in Campa and Kedia (2002). In the ordinal probit regression, *DIVD* is set to be 0 for domestic single-segment firms, 1 for domestic multi-segment firms, 2 for global single-segment firms and 3 for global multi-segment firms.

$$DIVD_{i,t} = \alpha_i + \beta_1 IOV_{i,t-1} + \beta_2 PROP_{i,t-1} + \beta_3 LNASSET_{i,t} + \beta_4 EBITS_{i,t-1} + \beta_5 CAPX_{i,t-1} + \beta_6 SP_{i,t} + \beta_7 NUMDIVFIRMS_{i,t} + \beta_8 SALEDIVFIRMS_{i,t} + \beta_9 MAVOL_{i,t} + \beta_{10} MANUM_{i,t} + \beta_{11} GDPG_t + \beta_{12} DIVPAID_{i,t} + \varepsilon_{i,t} \quad (8)$$

I include the lag of both variables of interest, institutional ownership volatility (IOV) and proportion (PROP), to predict the probable impact of these two variables on diversification decision. Higher proportion of institutional ownership and their stability in firms are expected to increase the firms' propensity to diversify. Following Campa and Kedia (2002), I add several control variables in the model such as the natural logarithm of the firm total assets (LNASSET), lagged EBIT-to-sale ratio (EBITS), lagged capital expenditure-to-sale ratio (CAPX), dummy variable for firms included in the S&P indices (SP), the number of diversified firms in the industry (NUMDIVFIRMS), the percentage of sales in the industry generated by diversified

firms (SALEDIVFIRMS), natural log of the values of all mergers and acquisitions in the industry (MAVOL), natural log of total number mergers and acquisitions in the industry(MANUM) and real GDP growth (GDPG). Following Villalonga (2004b), I also include the dummy variable for firms that pay dividend in the preceding year (DIVPAID). Alternatively, I replace IOV and PROP with institutional ownership persistence (IOP) and repeat the above analysis to show the impact of IOP on diversification decision.

5. Results

5.1. Univariate Results

Table 4 reports the average firm excess value sorted by institutional ownership proportion, stability, and persistence. In Panel A, the institutional ownership proportion varies horizontally and institutional ownership stability changes vertically. Basically, the proportion of institutional investors increases by moving to the right in the table whereas the stability of institutional owners decreases by moving down in the table. Consistent with previous results, Panel A exhibits a positive relationship between institutional ownership proportion and excess value. Higher proportion of institutional owners is associated with higher excess value. On the other hand, volatility of institutional owners has a negative relationship with excess value. High volatility (low stability) of institutional owners reduces excess value. The traditional t-test and the non-parametric Wilcoxon rank sum test indicate that the highest and the lowest level of ownership proportion (PROP) are significantly different across five levels of ownership stability (IOV), and vice versa. In Panel B, I examine excess value based on the quintiles of institutional ownership persistence (IOP). Institutional ownership persistence posits a positive linear relationship with excess value. An increase in the persistence of institutional ownership is associated with greater excess value for the firm. Both traditional t-test and the non-parametric

Wilcoxon rank sum test show that on average, firms with the highest and the lowest level of institutional ownership persistence have significantly different excess values.

Table 5 and 6 report firm's diversification profile (number of segments and Herfindahl index) based on institutional ownership proportion, stability, and persistence. In Table 5, number of business and geographic segments monotonically increases when institutional ownership proportion increases and stability is constant, and vice versa (Panel A and C). Similarly, an increase in the persistence of institutional ownership is positively associated with number of business and geographic segments (Panel B and D). Table 6 also reports that both industrial and geographical Herfindahl indices decreases with an increase in the proportion of institutional ownership, keeping institutional ownership stability constant, and vice versa (Panel A and C). An increase in institutional ownership persistence also reduces both industrial and geographical Herfindahl indices (Panel B and D). In sum, both Table 5 and 6 suggest that firms with higher institutional ownership stability, proportion and persistence are more diversified (higher number of segments and lower Herfindahl indices).

In Table 7, I sort firm risk measures (market risk and idiosyncratic risk) by institutional ownership stability and proportion (Panel A and C), and persistence (Panel B and D). Panel A shows that, firms with a higher proportion of institutional ownership have a higher market risk, keeping institutional ownership stability constant, and vice versa. Similarly, results in Panel B also indicate that market beta of firms with higher institutional ownership persistence is higher and closer to 1. On the other hand, Panel B shows that firms with higher proportion of institutional investors have lower idiosyncratic risk, keeping the stability of institutional investors constant. Firms with the same proportion but higher stability of institutional ownership also have a lower idiosyncratic risk. Similarly, firms with higher institutional ownership

persistence have a significantly lower idiosyncratic risk. In sum, Table 7 suggest that higher level of institutional ownership stability, proportion and persistence mitigate firms' idiosyncratic (unsystematic) risk and aggravate systematic risk adjust the firm risk exposure with the market beta.

5.2. Multivariate Results

Table 8 reports results from probit regressions, using institutional ownership volatility (IOV) and proportion (PROP). Panel A and B report consistent estimates for probit and ordinal probit, respectively. In Panel A, significant negative coefficient of lagged IOV (-0.089) suggests that institutional ownership volatility has an inverse impact on firm's propensity to diversify. In addition, significant positive coefficient of lagged PROP (0.147) indicates that institutional ownership proportion has a positive impact on firm's diversification decision. Consistently, Panel B reports similar findings, where coefficients of lagged IOV (-0.039) and lagged PROP (0.079) remain negative and significant. In Table 9, probit regressions results are reported using institutional ownership persistence (IOP). Results in both Panels are in line with prior findings; significant positive coefficients of IOP (0.380) in Panel A and (0.142) in Panel B suggest that persistence of institutional owners increase the probability of diversification decision.

6. Endogeneity

Prior studies argue that endogeneity of diversification decision (Campa and Kedia, 2002; Villalonga 2004b; Ammann et al, 2012; and He, 2012) and institutional ownership (Cornett et al., 2007) can distort the empirical results. Consequently, I estimate the model by employing dynamic panels General Method of Moments (GMM) as introduced by Arellano and Bond (1991), Arellano and Bover (1995) and Blundell and Bond (1998) to address this issue.

First, I intend to examine the impact of firm diversification profile on institutional ownership persistence, controlling for the endogeneity of diversification choice. Therefore, the following equation is estimated:

$$IOP_{i,t} = \alpha_i + \beta_1 IOP_{i,t-1} + \beta_2 DIVD_{i,t} + \beta_3 DM_{i,t} + \beta_4 GS_{i,t} + \beta_5 GM_{i,t} + \beta_6 LNASSET_{i,t} + \beta_7 BVDEBT_{i,t} + \beta_8 NUMDIVS_{i,t} + \beta_9 SALEDIVS_{i,t} + \beta_{10} DIVIDEND_{i,t-1} + \beta_{11} MAVOL_{i,t} + \beta_{12} MANUM_{i,t} + \varepsilon_{i,t} \quad (9)$$

where $IOP_{i,t}$ is the institutional ownership persistence and $DIVD_{i,t}$ is the diversification dummy that is set equal to 1 for diversified firms, 0 otherwise. $DM_{i,t}$, $GS_{i,t}$ and $GM_{i,t}$ are dummies for firm diversification profile that take the value equal to 1 if the firm is a domestic multi-segment firm, global single-segment firm or global multi-segment firm, respectively. $LNASSET_{i,t}$ is the natural log of firm's total assets, $BVDEBT_{i,t}$ is firm's book value of debt, $NUMDIVS_{i,t}$ is the number of diversified firms in the industry, $SALEDIVS_{i,t}$ is the percentage of sale by diversified firms in the industry, $DIVIDEND_{i,t-1}$ is the dummy variable for firms that paid dividend last year, $MAVOL_{i,t}$ is the natural log of mergers and acquisitions' volume in the industry and $MANUM_{i,t}$ is the natural log of number of mergers and acquisitions in industry. Alternatively, I use industrial (IHERF) and global (GHERF) Herfindahl indices to check robustness of the results.

As shown in Table 10, diversification does not have a significant impact on institutional ownership persistence. However, firm diversification profile has a significant impact on institutional ownership persistence (model 1); the significant negative coefficient of domestic multi-segment firms and the significant positive global single-segment firms indicate that industrial diversification reduces the persistence of institutional ownership while global

diversification enhances the persistence of institutional ownership. The coefficient of the natural log of total assets is also positive and significant and positive, suggesting that institutional ownership persistence is higher in larger firms (model 2 – 4). Alternative measures of diversification also support previous findings. IHERF (GHERF) has a significant positive (negative) association with IOP confirming that institutional owners are more persistence in firms with lower (higher) degree of industrial (global) diversification (model 5 – 7).

In the next step, I investigate the impact of institutional ownership stability, proportion and persistence on firm excess value, considering the endogeneity of institutional ownership. Therefore, the following equation is estimated:

$$EV_{i,t} = \alpha_i + \beta_1 EV_{i,t-1} + \beta_2 IOV_{i,t} + \beta_3 PROP_{i,t} + \beta_4 MktRisk_{i,t} + \beta_5 IdioRisk_{i,t} + \beta_6 LNASSET_{i,t} + \beta_7 BVDEBT_{i,t-1} + \beta_8 CAPXS_{i,t} + \beta_9 EBITS_{i,t} + \beta_{10} RDXS_{i,t} + \beta_{11} ADVXS_{i,t} + \varepsilon_{i,t} \quad (10)$$

where $EV_{i,t}$ is firm excess value, $IOV_{i,t}$ is institutional ownership volatility (stability) and $PROP_{i,t}$ is institutional ownership proportion. $MktRisk_{i,t}$ and $IdioRisk_{i,t}$ are the estimated firm market and idiosyncratic risk, respectively. $LNASSET_{i,t}$ is the natural log of firm's total assets and $BVDEBT_{i,t}$ is firm's book value of debt. Capital expenditure to sale ratio ($CAPXS_{i,t}$), EBIT to sale ratio ($EBITS_{i,t}$), research and development expenditure to sale ratio ($RDXS_{i,t}$), and advertising expenditure to sale ratio ($ADVXS_{i,t}$) are also included as additional control variables. Alternatively, I replace $IOV_{i,t}$ and $PROP_{i,t}$ with $IOP_{i,t}$ to check robustness of the results.

Table 11 reports the results. Before proceeding to results, I check the specifications of the models. AR (2) is not significant, which shows that there is no second-order autocorrelation and the models are not misspecified. Since I report robust standard errors, Sargan test of overidentification is not applicable. The significant negative coefficient of $IOV_{i,t}$ indicates that

an increase (decrease) in the volatility (stability) of institutional ownership reduces excess value of the firm. The significant positive coefficient of $PROP_{i,t}$, however, suggest that the higher the proportion of institutional ownership, the higher the excess value of the firm (model 1). Similarly, the coefficient of $IOP_{i,t}$ is also positive and significant, indicating that higher institutional ownership persistence is associated with higher excess value. In model 2 to 4, I include market and idiosyncratic risk and other control variables. The coefficient of $IOV_{i,t}$ remains negative and significant, confirming that higher (lower) institutional ownership volatility (stability) reduces the excess value. The coefficient of $PROP_{i,t}$ remains positive but not significant (model 3 and 5) whereas the coefficient of $IOP_{i,t}$ remains positive and significant (model 4 and 6). While market risk does not have a significant impact on excess value, idiosyncratic risk has a significant negative impact on firm excess value. The coefficient of $LNASSET_{i,t}$ is positive and significant, suggesting that larger firms have higher excess value (model 3, 4 and 5). Among other control variables, only research and development expenditure to sale ratio has a significant positive association with excess value.

7. Conclusion

The number of firms with global segments has increased over the period of 1998 through 2011. The percentage of institutional ownership has also increased significantly over the same period, as well. In this paper, I examine the link between institutional ownership and global diversification. Following Elyasiani et al., (2010), I measure three aspects of institutional ownership stability, proportion and persistence.

First, I show firms with higher institutional ownership stability, proportion and persistence are more diversified (more business and geographic segments; lower industrial and global

Herfindahl indices), have closer Beta to the market, lower idiosyncratic risk and higher excess value. Next, I use probit and ordinal probit regressions to confirm univariate results; the stability, proportion and persistence of institutional owners augment the probability of diversification. Lastly, I employ dynamic panel GMM to account for the endogeneity of institutional ownership and diversification discount; I show diversification does not have a significant relationship with the persistence of institutional owners, firms' diversification strategy can significantly impact the persistence of institutional owners. Industrial diversification decreases the persistence of institutional owners whereas global diversification increases this factor. Results also indicate that institutional ownership stability, proportion and persistence enhance firm excess value whereas idiosyncratic risk cuts excess value.

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Table 1 - Sample Distribution

Panel A - Number of Firm-Year Observations

	Focused	Diversified			
Year	Domestic Single-Segment Firms (DS)	Domestic Multi-Segment Firms (DM)	Global Single-Segment Firms (GS)	Global Multi-Segment Firms (GM)	Total
1998	711	329	367	306	1,713
1999	651	293	320	296	1,560
2000	637	251	343	254	1,485
2001	583	221	352	286	1,442
2002	586	217	401	292	1,496
2003	563	207	386	295	1,451
2004	555	222	423	295	1,495
2005	546	215	424	309	1,494
2006	550	217	464	322	1,553
2007	549	225	437	336	1,547
2008	558	217	436	325	1,536
2009	522	211	403	323	1,459
2010	516	235	438	381	1,570
2011	509	249	469	449	1,676
Total	8,036	3,309	5,663	4,469	21,477

Panel B - Number of Firms

	Number of Firms	Percent of the sample
Domestic Single-Segment Firms	1,545	33.10%
Domestic Multi-Segment Firms	912	19.54%
Global Single-Segment Firms	948	20.31%
Global Multi-Segment Firms	1,263	27.06%
Total	4,668	100%

This table provides the distribution of the sample by firm diversification profile over the period of 1998 through 2011. Domestic single-segment (focused) firms are firms with only one business segment located in the U.S. Domestic multi-segment firms are firms with more than one business segments located in the U.S. Global single-segment firms are firms with only one global segment. Global multi-segment firms are firms with more than one business and geographic segments.

Figure 1. Number of Firm-Year Observations

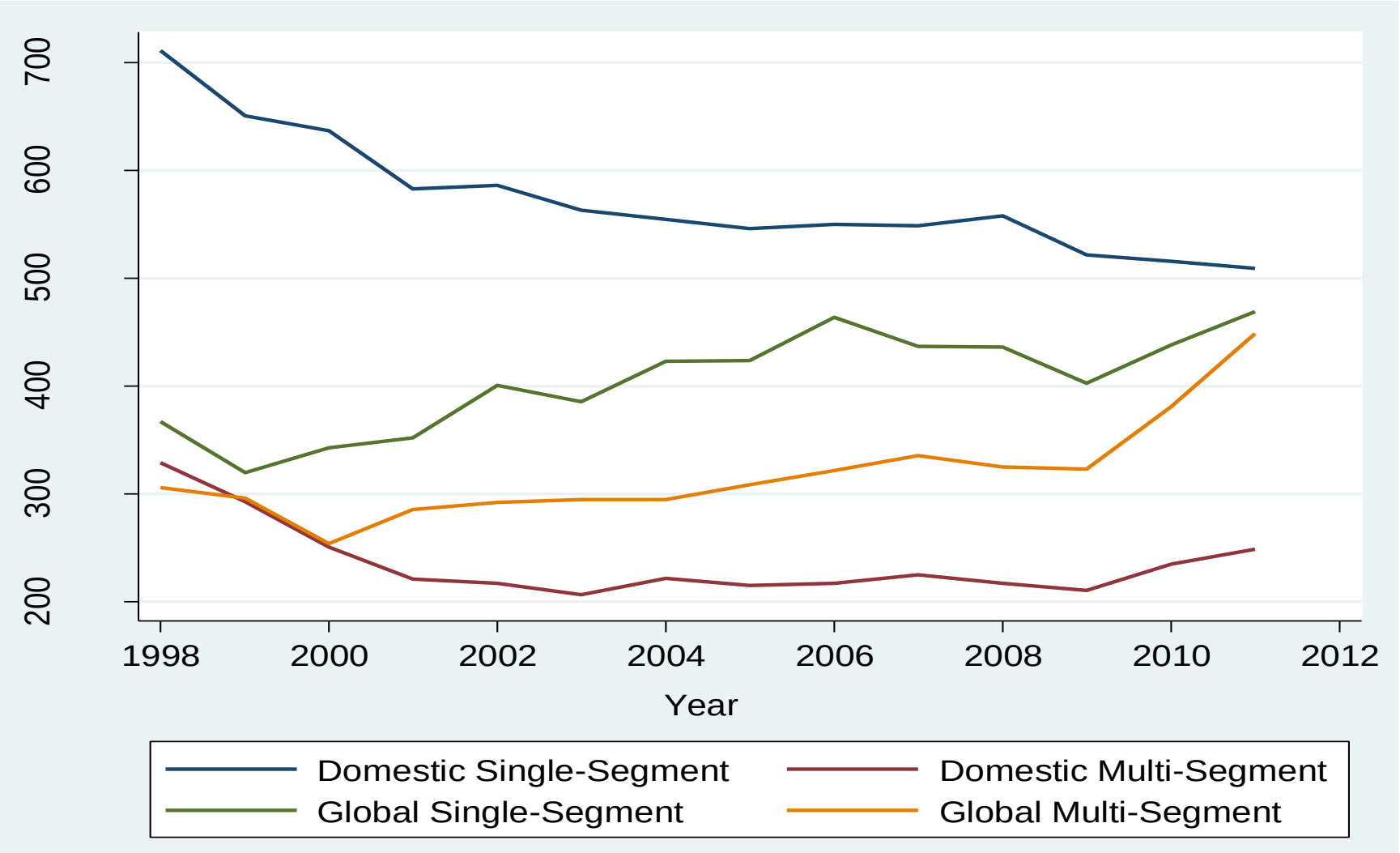

Table 2 - Descriptive Statistics

Panel A - Institutional Ownership Stability, Proportion, and Persistence

	N	*Mean*	*Median*	*Std-dev*	*Min*	*P25*	*P75*	*Max*
IOV	21477	0.68%	0.59%	0.55%	0.00%	0.34%	0.87%	18.75%
PROP	21477	34.61%	31.21%	22.97%	0.00%	15.08%	52.58%	99.68%
IOP	21477	151.95	102.26	149.87	14.90	46.08	194.13	594.35

Panel B - Excess Value, Risk and Diversification Profile

	N	*Mean*	*Median*	*Std-dev*	*Min*	*P25*	*P75*	*Max*
Excess Value	21477	0.006	0.000	0.577	-1.000	-0.426	0.431	1.019
Market Risk (Beta)	21477	0.897	0.899	0.544	-0.122	0.511	1.255	2.118
Idiosyncratic Risk	21477	0.566	0.468	0.339	0.204	0.325	0.690	1.570
# Bus segments	21477	1.647	1.000	1.045	1.000	1.000	2.000	8.000
# Geo segments	21477	2.174	2.000	1.778	1.000	1.000	3.000	23.000
IHERF	21477	0.851	1.000	0.226	0.362	0.673	1.000	1.000
GHERF	21477	0.805	1.000	0.247	0.323	0.577	1.000	1.000

This table provides the descriptive statistics of the 21,477 sample firm-year observations from 1998 through 2011. Institutional ownership volatility (IOV_i) is measured as the average standard deviation of institutional shareholding proportions across all investors in firm over a 5-year period (20 quarters). Institutional ownership proportion ($PROP_i$) is the percentage of firm *i* owned by institutions over a 5-year period (20 quarters). Institutional ownership persistence (IOP_i) is calculated as the ratio of the aggregate ownership proportion of each institution to the standard deviation of its ownership proportion over a 5-year period (20 quarters). Excess value is measured as the natural logarithm of the firm's actual market value (market value of equity plus book value of debt) divided by its hypothetical imputed value. The imputed segment values as product of segment sales by the median market value to sales ratio of single-segment domestic firms in the same industry. I employ the following modified Fama-French 3-factor model to obtain the idiosyncratic risk, U.S. market risk and world market risk of each firm in the sample:$(R_{it} - R_{ft}) = \alpha + \beta_1(R_{mt} - R_{ft}) + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 WMKT_t + \varepsilon_{it}$ where $(R_{it} - R_{ft})$ is the excess return of firm *i* on day *t*; $(R_{mt} - R_{ft})$ is the market excess return on day *t*; SMB_t is the excess return of the small-stock portfolio over the big-stock portfolio on day *t*; HML_t is the excess return of the high-book-to-market portfolio over the low book-to-market portfolio on day *t*. $WMKT_t$ is the difference between the returns on the MSCI World Excluding U.S. index on day *t* and the risk –free rate in the U.S. market. The factors are obtained from Professor Kenneth French website. The above model is estimated cross-sectionally by firm and year. $\beta_1$captures the firm's exposureto U.S. market risk (Beta) and the standard deviation of residuals for each firm in each year captures the daily idiosyncratic risk of the firm. The daily idiosyncratic risk is multiplied by the square root of the number of trading days in a year ($\sqrt{250}$) to obtain the annualized idiosyncratic risk. The number of business (# Bus) and geographic (# Geo) segments are reported according to COMPUSTAT segment data. Industrial (IHERF) and Global (GHERF) sales-based Herfindahl indices are calculated as the square of the ratio of the segment sales (from an industrial segment or from a geographic segment) of the firm *i* in year *t* to the firm's total sales across all reported segments in that year.*, ** and *** indicate the significance levels of 10%, 5% and 1%, respectively.

Table 3 - Institutional Ownership, Excess Value and Risk Comparisons based on Firm Diversification Profile

Panel A - Diversification Profile

	N	*IOV*	*PROP*	*IOP*	*Excess Value*	*Market Beta*	*Idio Risk*	*# Bus seg*	*# Geo seg*	*IHERF*	*GHERF*
Single-Segment (Focused)	8,036	0.725%	29.963%	115.276	0.013	0.841	0.602	1.000	1.000	1.000	1.000
		(0.636%)	(25.475%)	(78.122)	(0.000)	(0.829)	(0.511)	(1.000)	(1.000)	(1.000)	(1.000)
Multi-Segment (Diversified)	13,441	0.647%	37.387%	173.877	0.002	0.930	0.545	2.105	3.011	0.758	0.683
		(0.560%)	(35.125%)	(121.675)	(0.004)	(0.933)	(0.441)	(2.000)	(3.000)	(0.830)	(0.677)

Panel B - Firm Profile

	N	*IOV*	*PROP*	*IOP*	*Excess Value*	*Market Beta*	*Idio Risk*	*# Bus seg*	*# Geo seg*	*IHERF*	*GHERF*
Domestic Single-Segment Firms (DS)	8,036	0.725%	29.963%	115.276	0.013	0.841	0.602	1.000	1.000	1.000	1.000
		(0.636%)	(25.475%)	(78.122)	(0.000)	(0.829)	(0.511)	(1.000)	(1.000)	(1.000)	(1.000)
Domestic Multi-Segment Firms (DM)	3,309	0.691%	30.160%	126.730	-0.125	0.805	0.594	2.665	1.000	0.630	1.000
		(0.585%)	(25.578%)	(82.882)	-(0.139)	(0.769)	(0.486)	(2.000)	(1.000)	(0.601)	(1.000)
Global Single-Segment Firms (GS)	5,663	0.669%	37.821%	169.215	0.100	0.956	0.551	1.000	3.378	1.000	0.575
		(0.597%)	(35.243%)	(115.237)	(0.121)	(0.946)	(0.463)	(1.000)	(3.000)	(1.000)	(0.551)
Global Multi-Segment Firms (GM)	4,469	0.586%	42.187%	214.695	-0.027	0.991	0.500	2.879	3.628	0.546	0.586
		(0.505%)	(42.221%)	(163.249)	-(0.019)	(1.001)	(0.385)	(3.000)	(3.000)	(0.519)	(0.565)
Total	21,477	0.676%	34.609%	151.951	0.006	0.897	0.566	1.682	2.347	0.849	0.802
		(0.587%)	(31.209%)	(102.263)	(0.000)	(0.899)	(0.468)	(1.000)	(2.000)	(1.000)	(1.000)

This table compares and contrasts variables among the 21,477 sample firm-year observations from 1998 through 2011 grouped by their diversification strategy. Domestic single-segment firms are have only one business segment in the U.S. Domestic multi-segment firms have more than one business segments in the U.S. Global single-segment firms have a global segment. Global multi-segment firms have more than one business and geographic segments. Institutional ownership volatility (IOV_i) is measured as the average standard deviation of institutional shareholding proportions across all investors in firm over a 5-year period (20 quarters). Institutional ownership proportion ($PROP_i$) is the percentage of firm *i* owned by institutions over a 5-year period (20 quarters). Institutional ownership persistence (IOP_i) is calculated as the ratio of the aggregate ownership proportion of each institution to the standard deviation of its ownership proportion over a 5-year period (20 quarters). Excess value is measured as the natural logarithm of the firm's actual market value (market value of equity plus book value of debt) divided by its hypothetical imputed value. The imputed segment values as product of segment sales by the median market value to sales ratio of single-segment domestic firms in the same industry. I employ the following modified Fama-French 3-factor model to obtain the idiosyncratic risk, U.S. market risk and world market risk of each firm in the sample: $(R_{it} - R_{ft}) = \alpha + \beta_1(R_{mt} - R_{ft}) + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 WMKT_t + \varepsilon_{it}$ where $(R_{it} - R_{ft})$ is the excess return of firm *i* on day *t*; $(R_{mt} - R_{ft})$ is the market excess return on day *t*; SMB_t is the excess return of the small-stock portfolio over the big-stock portfolio on day *t*; HML_t is the excess return of the high-book-to-market portfolio over the low book-to-market portfolio on day *t*. $WMKT_t$ is the difference between the returns on the MSCI World Excluding U.S. index on day *t* and the risk –free rate in the U.S. market. The factors are obtained from Professor Kenneth French website. The above model is estimated cross-sectionally by firm and year. $\beta_1$captures the firm's exposure to U.S. market risk (Beta) and the standard deviation of residuals for each firm in each year captures the daily idiosyncratic risk of the firm. The daily idiosyncratic risk is multiplied by the square root of the number of trading days in a year ($\sqrt{250}$) to obtain the annualized idiosyncratic risk. The number of business (# Bus) and geographic (# Geo) segments are reported according to COMPUSTAT segment data. Industrial (IHERF) and Global (GHERF) sales-based Herfindahl indices are calculated as the square of the ratio of the segment sales (from an industrial segment or from a geographic segment) of the firm *i* in year *t* to the firm's total sales across all reported segments in that year. *, ** and *** indicate the significance levels of 10%, 5% and 1%, respectively.

Table 4 - Excess Value Portfolios Sorted by Institutional Ownership Proportion, Stability, and Persistence

Panel A

		Prop Low				Prop High			
		0	1	2	3	4	H-L	t-statistics	Wilcoxon
IOV Low	0	-0.079	0.147	0.186	0.211	0.224	0.30313	-12.39***	11.65***
	1	-0.158	0.142	0.168	0.134	0.127	0.28497	-11.21***	10.95***
	2	-0.224	-0.028	0.091	0.127	0.107	0.33107	-11.33***	-10.83***
	3	-0.224	-0.120	0.037	0.061	0.084	0.30865	-9.75***	-9.45***
IOV High	4	-0.282	-0.232	-0.166	-0.117	0.043	0.32498	-10.11***	9.8***
	H-L	-0.203	-0.379	-0.352	-0.329	-0.181			
t-statistics		7.9***	13.9***	13.56***	11.3***	5.79***			
Wilcoxon		-7.04***	13.35***	13.03***	10.96***	-5.64***			

Panel B

	0	1	2	3	4	H-L	T-statistics	Wilcoxon
IOP	-0.240	-0.080	0.072	0.120	0.159	0.399	-34.14***	-32.31***

This table reports the average excess value of 25 portfolios sorted in two dimensions: institutional ownership proportion (PROP) and institutional ownership stability (IOV) in Panel A; institutional ownership persistence (IOP) in Panel B. Excess value is measured as the natural logarithm of the firm's actual market value (market value of equity plus book value of debt) divided by its hypothetical imputed value. The imputed segment values as product of segment sales by the median market value to sales ratio of single-segment domestic firms in the same industry. In each year, excess value is divided into quintiles based on the institutional ownership proportion, where each proportion quintile is divided into five groups according to institutional ownership stability measure. The last two columns of Panel A present t-statistics and Wilcoxon test between the highest and the lowest proportion portfolio in the same IOV quintile. The last two rows present the t-statistics and Wilcoxon test between the highest and the lowest IOV portfolio in the same ownership proportion quintile. The last two columns of Panel B present t-statistics and Wilcoxon test between the highest and the lowest persistence portfolios. *, ** and *** indicate the significance levels of 10%, 5% and 1%, respectively.

Table 5 - Number of Segments Sorted by Institutional Ownership Stability, Proportion and Persistence

Panel A - Number of Business Segments Sorted by Institutional Ownership Stability, Proportion

		Prop Low				Prop High			
		0	1	2	3	4	H-L	T-statistics	Wilcoxon
IOV Low	0	1.581	1.881	2.009	2.409	2.374	-0.793	-12.36***	11.98***
	1	1.535	1.625	1.707	2.043	2.063	-0.529	-10.34***	10.51***
	2	1.513	1.484	1.617	1.801	1.872	-0.359	-6.84***	-5.91***
	3	1.426	1.463	1.496	1.540	1.675	-0.249	-5.00***	-4.11***
IOV High	4	1.480	1.443	1.533	1.543	1.577	-0.098	-1.81*	1.93*
	H-L	0.101	0.439	0.476	0.865	0.797			
T-statistics		2.39**	8.03***	7.81***	11.41***	11.04***			
Wilcoxon		-2.14**	7.28***	7.67***	11.31***	-8.72***			

Panel B - Number of Business Segments Sorted by Institutional Ownership Persistence

	0	1	2	3	4	H-L	T-statistics	Wilcoxon
IOP	1.488	1.499	1.539	1.696	2.015	-0.528	-21.82***	-19.12***

Panel C - Number of Geographic Segments Sorted by Institutional Ownership Stability, Proportion

		Prop Low				Prop High			
		0	1	2	3	4	H-L	T-statistics	Wilcoxon
IOV Low	0	1.860	2.295	2.964	3.136	3.352	-1.492	-16.72***	21.01***
	1	1.831	2.170	2.303	2.618	3.167	-1.336	-14.58***	-16.26***
	2	1.778	2.096	2.284	2.667	2.764	-0.986	-11.42***	-12.50***
	3	1.792	1.956	2.153	2.454	2.572	-0.780	-8.02***	-6.80***
IOV High	4	1.758	2.087	2.085	2.278	2.290	-0.532	-5.09***	5.65***
	H-L	0.102	0.208	0.879	0.858	1.062			
T-statistics		1.35	2.45**	8.69***	7.55***	9.24***			
Wilcoxon		-0.63	3.08***	10.24***	9.64***	-10.87***			

Panel D - Number of Geographic Segments Sorted by Institutional Ownership Persistence

	0	1	2	3	4	H-L	T-statistics	Wilcoxon
IOP	1.699	1.879	2.093	2.363	2.834	-1.135	-30.62***	-33.91***

This table reports the number of business and geographic segments of 25 portfolios sorted in two dimensions: institutional ownership proportion (PROP) and institutional ownership stability (IOV) in Panel A; institutional ownership persistence (IOP) in Panel B. The number of business and geographic segments are reported according to COMPUSTAT segment data. In each year, the number of segment is divided into quintiles based on the institutional ownership proportion, where each proportion quintile is divided into five groups according to institutional ownership stability measure. The last two columns of Panel A present t-statistics and Wilcoxon test between the highest and the lowest proportion portfolio in the same IOV quintile. The last two rows present the t-statistics and Wilcoxon test between the highest and the lowest IOV portfolio in the same ownership proportion quintile. The last two columns of Panel B present t-statistics and Wilcoxon test between the highest and the lowest persistence portfolios. *, ** and *** indicate the significance levels of 10%, 5% and 1%, respectively.

Table 6 - Herfindahl Index Sorted by Institutional Ownership Stability, Proportion and Persistence

Panel A - Industrial Herfindahl sorted by Institutional ownership Stability and Proportion

		Prop Low				Prop High			
		0	1	2	3	4	H-L	T-statistics	Wilcoxon
IOV Low	0	0.866	0.866	0.799	0.755	0.752	0.114	9.78***	-9.2***
	1	0.876	0.876	0.837	0.775	0.781	0.095	8.78***	-8.25***
	2	0.878	0.878	0.864	0.828	0.810	0.069	6***	5.15***
	3	0.898	0.898	0.885	0.873	0.846	0.053	4.53***	3.59***
IOV High	4	0.873	0.873	0.875	0.869	0.864	0.010	0.74	-0.91
	H-L	-0.008	-0.008	-0.076	-0.114	-0.112			
T-statistics		-0.74	-6.25***	-6.14***	-8.05***	-7.85***			
Wilcoxon		1.36	-6.18***	-5.79***	-8.28***	6.93***			

Panel B - Industrial Herfindahl sorted by Institutional ownership Persistence

	0	1	2	3	4	H-L	T-statistics	Wilcoxon
IOP	0.882	0.881	0.871	0.838	0.785	0.098	19.64***	18.654***

Panel C - Geographical Herfindahl sorted by Institutional ownership Stability and Proportion

		Prop Low				Prop High			
		0	1	2	3	4	H-L	T-statistics	Wilcoxon
IOV Low	0	0.883	0.796	0.693	0.666	0.666	0.217	24.01***	-23.01***
	1	0.888	0.839	0.804	0.754	0.754	0.134	20.03***	-18.87***
	2	0.884	0.839	0.829	0.765	0.765	0.119	14.18***	13.18***
	3	0.879	0.865	0.829	0.791	0.791	0.088	9.17***	7.41***
IOV High	4	0.888	0.844	0.841	0.815	0.815	0.073	5.77***	-6.16***
	H-L	-0.005	-0.047	-0.148	-0.149	-0.149			
T-statistics		-0.55	-4.04***	-11.34***	-10.38***	-12.48***			
Wilcoxon		0.51	-3.94***	-11.38***	-10.51***	11.48***			

Panel D - Geographical Herfindahl sorted by Institutional ownership Persistence

	0	1	2	3	4	H-L	T-statistics	Wilcoxon
IOP	0.880	0.854	0.822	0.781	0.688	0.192	37.77***	35.421***

This table reports the Herfindahl index of 25 portfolios sorted in two dimensions: institutional ownership proportion (PROP) and institutional ownership stability (IOV) in Panel A; institutional ownership persistence (IOP) in Panel B. Industrial (IHERF) and Global (GHERF) sales-based Herfindahl indices are calculated as the square of the ratio of the segment sales (from an industrial segment or from a geographic segment) of the firm *i* in year *t* to the firm's total sales across all reported segments in that year. In each year, Herfindahl index is divided into quintiles based on the institutional ownership proportion, where each proportion quintile is divided into five groups according to institutional ownership stability measure. The last two columns of Panel A present t-statistics and Wilcoxon test between the highest and the lowest proportion portfolio in the same IOV quintile. The last two rows present the t-statistics and Wilcoxon test between the highest and the lowest IOV portfolio in the same ownership proportion quintile. The last two columns of Panel B present t-statistics and Wilcoxon test between the highest and the lowest persistence portfolios. *, ** and *** indicate the significance levels of 10%, 5% and 1%, respectively.

Table 7 - Firm Risk Sorted by Institutional Ownership Stability, Proportion and Persistence

Panel A - Market Risk (Beta) sorted by Institutional ownership Stability and Proportion

		Prop Low				Prop High			
		0	1	2	3	4	H-L	T-statistics	Wilcoxon
IOV Low	0	0.732	0.962	0.990	0.963	0.953	-0.221	-10.97***	11.3***
	1	0.690	1.024	1.059	1.069	1.065	-0.375	-16.53***	16.31***
	2	0.682	0.869	1.079	1.121	1.104	-0.423	-15.64***	-15.96***
	3	0.638	0.765	0.943	1.105	1.058	-0.420	-13.57***	-14.61***
IOV High	4	0.554	0.609	0.644	0.780	0.987	-0.433	-13.93***	13.7***
	H-L	0.178	0.353	0.346	0.183	-0.035			
T-statistics		6.58***	14.13***	14.07***	6.83***	-1.37			
Wilcoxon		-6.56***	14.58***	14.21***	7.05***	1.04			

Panel B - Market Risk (Beta) sorted by Institutional ownership Persistence

	0	1	2	3	4	H-L	T-statistics	Wilcoxon
IOP	0.596	0.781	1.024	1.073	1.012	-0.417	-38.478***	-38.633***

Panel C - Idiosyncratic Risk sorted by Institutional ownership Stability and Proportion

		Prop Low				Prop High			
		0	1	2	3	4	H-L	T-statistics	Wilcoxon
IOV Low	0	0.725	0.471	0.411	0.449	0.370	0.355	5.47***	-28.21***
	1	0.731	0.594	0.480	0.450	0.398	0.333	-19.03***	-26.43***
	2	0.778	0.634	0.539	0.481	0.407	0.370	-20.31***	24.06***
	3	0.786	0.645	0.567	0.509	0.440	0.346	-16.5***	21.17***
IOV High	4	0.795	0.706	0.628	0.574	0.524	0.271	19.19***	-15.5***
	H-L	-0.070	-0.235	-0.217	-0.126	-0.154			
T-statistics		-4.21***	-15.5***	-13.98***	-6.08***	-8.47***			
Wilcoxon		5.47***	-19.03***	-20.31***	-16.5***	19.19***			

Panel D - Idiosyncratic Risk sorted by Institutional ownership Persistence

	0	1	2	3	4	H-L	T-statistics	Wilcoxon
IOP	0.767	0.636	0.546	0.469	0.411	0.356	48.835***	56.692***

This table reports the market and idiosyncratic risk of 25 portfolios sorted in two dimensions: institutional ownership proportion (PROP) and institutional ownership stability (IOV) in Panel A; institutional ownership persistence (IOP) in Panel B. I employ the following modified Fama-French 3-factor model to obtain the idiosyncratic risk, U.S. market risk and world market risk of each firm in the sample:$(R_{it} - R_{ft}) = \alpha + \beta_1(R_{mt} - R_{ft}) + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 WMKT_t + \varepsilon_{it}$ where $(R_{it} - R_{ft})$ is the excess return of firm *i* on day *t*; $(R_{mt} - R_{ft})$ is the market excess return on day *t*; SMB_t is the excess return of the small-stock portfolio over the big-stock portfolio on day *t*; HML_t is the excess return of the high-book-to-market portfolio over the low book-to-market portfolio on day *t*. $WMKT_t$ is the difference between the returns on the MSCI World Excluding U.S. index on day *t* and the risk –free rate in the U.S. market. The factors are obtained from Professor Kenneth French website. The above model is estimated cross-sectionally by firm and year. $\beta_1$captures the firm's exposure to U.S. market risk (Beta) and the standard deviation of residuals for each firm in each year captures the daily idiosyncratic risk of the firm. The daily idiosyncratic risk is multiplied by the square root of the number of trading days in a year ($\sqrt{250}$) to obtain the annualized idiosyncratic risk. In each year, risk is divided into quintiles based on the institutional ownership proportion, where each proportion quintile is divided into five groups according to institutional ownership stability measure. The last two columns of Panel A present t-statistics and Wilcoxon test between the highest and the lowest proportion portfolio in the same IOV quintile. The last two rows present the t-statistics and Wilcoxon test between the highest and the lowest IOV portfolio in the same ownership proportion quintile. The last two columns of Panel B present t-statistics and Wilcoxon test between the highest and the lowest persistence portfolios. *, ** and *** indicate the significance levels of 10%, 5% and 1%, respectively.

Table 8 - Probit Regressions of Diversification Decision with Institutional Ownership Stability and Proportion

	Panel A - Probit - Dependent Variable = Dummy for Diversified Firms		***Panel B - Ordered Probit - Dependent Variable = Dummy for Each Diversification Profile***	
	Coef	***t-stat***	***Coef***	***t-stat***
Lagged IOV	-0.089	-3.840 ***	-0.039	-4.588 ***
Lagged PROP	0.147	5.141 ***	0.079	8.339 ***
Ln of Total Asset	0.539	16.683 ***	0.216	20.150 ***
Lagged EBIT/Sale	0.275	1.488	0.073	1.212
Lagged Capital Expenditure/Sale	0.036	1.227	0.009	0.825
Dummy for Firms in S&P Index	0.084	3.833 ***	0.037	4.681 ***
# of diversified firms in the industry	1.139	41.096 ***	0.416	45.433 ***
% of industry' sale by diversified firms	-0.157	-6.041 ***	-0.082	-9.458 ***
Ln of Volume of M&A in the industry	0.131	4.930 ***	0.029	3.321 ***
Ln of Number of M&A in the industry	0.453	16.171 ***	0.182	19.947 ***
Real GDP growth	0.159	7.049 ***	0.064	8.416 ***
Firms paid dividend last year	0.103	4.374 ***	0.055	6.968 ***
Constant	-2.362	-31.738 ***	2.183	34.976 ***
Constant			2.626	41.624 ***
Constant				3.486
Observations	16,780		16,780	
Pseudo R-squared	0.149		0.0893	
LR chi2	3301		3993	

I estimate the decision to diversify using the probit regression (in Panel A) and the ordinal probit regression (in Panel B). In Panel A, the dependent variable is the dummy variable for whether the firm is diversified or not. In Panel B, the dependent variable is the dummy variable coded into 0 for DS firms, 1 for DM firms, 2 for GS firms and 3 for GM firms. Domestic single-segment (DS) firms are firms that have only one business segment located in the U.S. Domestic multi-segment (DM) firms are firms with more than one business segments located in the U.S. Global single-segment (GS) firms are firms with a segment located globally. Global multi-segment (GM) firms are firms with more than one business and geographic segments. Institutional ownership volatility (IOV_i) is measured as the average standard deviation of institutional shareholding proportions across all investors in firm over a 5-year period (20 quarters). Institutional ownership proportion ($PROP_i$) is the percentage of firm *i* owned by institutions over a 5-year period (20 quarters). *, ** and *** indicate the significance levels of 10%, 5% and 1%, respectively.

Table 9 - Probit Regressions of Diversification Decision with Institutional Ownership Persistence

	Panel A - Probit - Dependent Variable = Dummy for Diversified Firms		***Panel B - Ordered Probit - Dependent Variable = Dummy for Each Diversification Profile***	
	Coef	***t-stat***	***Coef***	***t-stat***
Lagged IOP	0.380	11.595 ***	0.142	13.362 ***
Ln of Total Asset	0.405	12.553 ***	0.176	16.003 ***
Lagged EBIT/Sale	0.523	4.038 ***	0.180	3.816 ***
Lagged Capital Expenditure/Sale	0.045	2.081 **	0.013	1.652 *
Dummy for Firms in S&P Index	0.071	3.629 ***	0.035	5.088 ***
# of diversified firms in the industry	1.106	44.572 ***	0.402	48.970 ***
% of industry' sale by diversified firms	-0.153	-6.584 ***	-0.079	-10.180 ***
Ln of Volume of M&A in the industry	0.150	6.455 ***	0.038	4.907 ***
Ln of Number of M&A in the industry	0.423	17.642 ***	0.173	21.866 ***
Real GDP growth	0.128	6.362 ***	0.049	7.315 ***
Firms paid dividend last year	0.057	2.749 ***	0.035	4.927 ***
Constant	-2.136	-33.792 ***	1.981	37.562 ***
Constant			2.443	45.798 ***
Constant			3.292	60.221 ***
Observations	20,878		20,878	
Pseudo R-squared	0.147		0.0876	
LR chi2	4036		4886	

I estimate the decision to diversify using the probit regression (in Panel A) and the ordinal probit regression (in Panel B). In Panel A, the dependent variable is the dummy variable for whether the firm is diversified or not. In Panel B, the dependent variable is the dummy variable coded into 0 for DS firms, 1 for DM firms, 2 for GS firms and 3 for GM firms. Domestic single-segment (DS) firms are firms that have only one business segment located in the U.S. Domestic multi-segment (DM) firms are firms with more than one business segments located in the U.S. Global single-segment (GS) firms are firms with a segment located globally. Global multi-segment (GM) firms are firms with more than one business and geographic segments. Institutional ownership persistence (IOP_i) is calculated as the ratio of the aggregate ownership proportion of each institution to the standard deviation of its ownership proportion over a 5-year period (20 quarters).*, ** and *** indicate the significance levels of 10%, 5% and 1%, respectively.

Table 10 - Dynamic Panel GMM of IOP and Firms Diversification Profile

		IOP						
	Sign	***Model 1***	***Model 2***	***Model 3***	***Model 4***	***Model 5***	***Model 6***	***Model 7***
Lagged *IOP*	+	0.0404*	0.0402*	0.0390*	0.0387*	0.0400*	0.0388*	0.0386*
		(0.0239)	(0.0237)	(0.0221)	(0.0219)	(0.0237)	(0.0221)	(0.0219)
Diversified	?	-0.633						
		(2.799)						
Domestic Multi-Segment (DM)	-		-18.99**	-20.69**	-21.32**			
			(8.099)	(8.756)	(9.013)			
Global Single-Segment (GS)	+		18.12***	10.06**	7.371*			
			(6.704)	(4.716)	(4.089)			
Global Multi-Segment (GM)	?		2.739	-6.020	-7.375			
			(4.196)	(4.702)	(4.918)			
IHERF	+					22.04*	27.47**	26.13**
						(11.62)	(13.25)	(12.95)
GHERF	-					-95.54***	-61.22**	-58.77**
						(35.33)	(24.51)	(23.15)
Ln of Total Asset	+			67.97***	67.60***		67.12***	66.74***
				(16.61)	(16.27)		(16.27)	(15.93)
Book Value of Debt	?			-1.528	-1.897		-3.180	-3.526
				(11.50)	(11.10)		(10.97)	(10.60)
# of diversified firms in the industry	+				79.68*			78.31*
					(43.67)			(43.16)
% of industry' sale by diversified firms	+				1.513			1.563
					(6.057)			(6.088)
Firms paid dividend last year	+				6.296*			6.509*
					(3.344)			(3.401)
Ln of Volume of M&A in the industry	-				1.67e-05			1.50e-05
					(2.08e-05)			(2.07e-05)
Ln of Number of M&A in the industry	-				-0.140***			-0.142***
					(0.0378)			(0.0378)
Constant		173.8***	170.8***	-231.8**	-248.3**	232.0***	-201.4**	-219.3**
		(6.871)	(6.674)	(103.5)	(112.1)	(26.30)	(93.64)	(103.1)
Number of observations (Firm-Year)		10,239	10,239	10,239	10,239	10,239	10,239	10,239
Number of firms		2,492	2,492	2,492	2,492	2,492	2,492	2,492

Table 11 - Dynamic Panel GMM of IOP and Firms Diversification Profile

		Excess Value					
	Sign	***Model 1***	***Model 2***	***Model 3***	***Model 4***	***Model 5***	***Model 6***
Lagged *Excess Value*	+	0.384***	0.387***	0.396***	0.401***	0.397***	0.402***
		(0.0228)	(0.0229)	(0.0231)	(0.0232)	(0.0263)	(0.0265)
IOV	-	-6.707***		-6.117***		-5.805***	
		(1.356)		(1.333)		(1.350)	
PROP	+	0.174***		0.0147		0.0323	
		(0.0617)		(0.0697)		(0.0703)	
IOP	+		0.000269***		0.000166**		0.000151*
			(7.86e-05)		(7.47e-05)		(8.34e-05)
Market Risk (Beta)	+			-0.00547	-0.00427	-0.00330	-0.00193
				(0.0107)	(0.0107)	(0.0109)	(0.0110)
Idiosyncratic Risk	-			-0.0833***	-0.0846***	-0.0604***	-0.0627***
				(0.0209)	(0.0207)	(0.0214)	(0.0213)
Ln of Total Asset	+			0.126***	0.120***	0.119***	0.115***
				(0.0213)	(0.0199)	(0.0228)	(0.0213)
Book Value of Debt	+			0.0885**	0.0876**	0.0696*	0.0679
				(0.0416)	(0.0417)	(0.0419)	(0.0420)
CAPX/Sale (Industry Adjusted)	+					0.0462	0.0431
						(0.0390)	(0.0389)
EBIT/Sale (Industry Adjusted)	+					-0.0269	-0.0268
						(0.0246)	(0.0248)
RDX/Sale (Industry Adjusted)	+					0.115***	0.116***
						(0.0428)	(0.0428)
ADVX/Sale (Industry Adjusted)	+					-0.133	-0.165
						(0.449)	(0.449)
Constant		-0.0361	-0.0678***	-0.733***	-0.765***	-0.682***	-0.713***
		(0.0246)	(0.0146)	(0.124)	(0.122)	(0.131)	(0.129)
Arellano-Bond AR(1) p-value		0.000	0.000	0.000	0.000	0.000	0.000
Arellano-Bond AR(2) p-value		0.764	0.771	0.932	0.987	0.852	0.817
Sargan Test (p-value)		N/A	N/A	N/A	N/A	N/A	N/A
Number of observations (Firm-Year)		10,239	10,239	10,239	10,239	8,481	8,481
Number of firms		2,492	2,492	2,492	2,492	2,170	2,170