# THE IMPACT OF INSTITUTIONAL SHAREHOLDING ON FIRM INCOME INSTABILITY RISK: EVIDENCE FROM FINLAND

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**Abstract**

We empirically examine the effect of institutional shareholding on firm risk-taking, narrowly defined. We categorize institutional shareholding into those with both investment and business relationships with the firms in which they own equity stakes (termed *pressure-sensitive* institutions), and institutions with only an investment relationship with the firm (termed *pressure-resistant*). The results suggest a differential impact of different institutional investors on firm risk-taking.

**Keywords:** corporate governance, institutional investors, risk-taking, income instability risk

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## 1. Introduction

Corporate governance issues, arising from the agency problems engendered by the separation of ownership and control and the inability to write complete contracts for all future eventualities have been recognised for decades (see e.g. Hart 1995, Shleifer and Vishny 1997, and Berle and Means 1932). Berle and Means (1932), among others, note that the separation of ownership and control in publicly owned firms induces potential conflicts between the interests of professional managers and stockholders. This divergence of managers' and stockholders objective may lead to acute conflict of interest in decisions regarding the strategic orientation of the firm.

Keasey and Wright (1993) provide a framework of corporate governance that suggests effective governance includes a set of activities involving institutional investors. The corporate governance literature also stresses the need for corporate governance processes to encompass mechanisms for motivating managerial behaviour towards increasing the wealth of the business or risk-taking (Short et al. 1999). Firm risk-taking can enhance shareholders' value by creating a work environment that supports individual and corporate growth, giving employees an opportunity to use their creative skills, quickening a company's response to the market, and creating an organisational culture that fosters cross-functional collaboration. These changes in turn promote efforts that create new revenue streams (see e.g. Zahra, 1991).

Given that governance structures need to encompass mechanisms for increasing the wealth of businesses or risk-taking, an important issue to consider then is the extent to which institutional investors affect firm risk-taking. As institutional investors can bring significant pressure that improves firm performance, an analysis of their effect may provide additional insight on the nature of firm risk-taking. For the purposes of this paper, we define firm risk-taking as the analysis and selection of projects that have varying uncertainties associated with their expected outcomes and corresponding cash flows. The unpredictability in a firm's income stream (see for instance Bromiley 1991, and Wright, Kroll, Pray and Lado 1995) is result of its risk-taking behaviour. In effect, we only focus on firms' income stream risk in this paper.

The role of institutional investors on firm risk-taking has been under explored in the literature. A study by Wright et al. (1996) attempted to fill the void. However, in their study, Wright et al. (1996) treated institutional shareholders as a monolithic group without regard to some evident differences. Both theoretical work (see Shleifer and Vishny 1986) and empirical examinations (see McConnell and Servaes 1990) suggest that shareholders are differentiable and can be classified in subgroups. Also

Jensen and Merkling (1976) formally show that equity ownerships by different groups have different effects on the firm performance. Furthermore, the finance literature notes two competing hypotheses, *myopic institutional theory* and *the efficient market theory*, which predict different outcomes on the relationship between institutional investors and firm risk-taking. Wright et al. (1996) did not take these hypotheses and shareholder differences into consideration in their study.

As a contribution to contemporary studies investigating the relationship between corporate governance structures and processes and corporate risk-taking, we adopt an approach that looks at an important agency issue not from a monolithic point of view but a disaggregated standpoint. Two classes of institutional investors, termed *pressure-sensitive* and *pressure-resistant* (see Brickley et al. 1988 and Kochhar and David 1996), are extracted from the large group of institutional shareholders and their effect firm risk-taking examined. Thus, the two competing hypotheses are incorporated into the empirical examination. We suggest a differential impact of these two classes of institutional ownership on firm income stream risk (firm risk-taking).

To summarize the results of the paper, we find a positive relationship between institutional shareholding and firm risk-taking when institutional investors are considered as a homogeneous group. We also find a differential impact of two groups of institutional shareholders on firm risk-taking. The evidence suggests a negative (positive) relationship between *pressure-sensitive* (*pressure-resistant*) institutional investors and firm risk taking.

The remainder of the paper is structured as follows: Section 2 examines the link between institutional investors and firm risk-taking. Section 3 looks at the sample construction and methodology. Section 4 presents the results of the econometric analyses and Section 5 concludes the paper.

## 2. Institutional investors and firm risk-taking

The existing literature indicates two conflicting theoretical perspectives predicting different outcomes on the nature of the relationship between institutional investors and firm risk-taking. These two perspectives are the *myopic institutional theory* and the *efficient market theory*.

The myopic institutions theory argues that institutional fund managers tend to be evaluated quarterly, are under pressure to report higher earnings during that time frame, and, therefore, may not be able to afford longer horizons in their investment decisions. Furthermore, these institutional fund managers may lack access to proprietary firm-specific information, and may therefore find it difficult to assess the long-term value of a firm. Hence, they may focus on performance measures, like current earnings, that are easily quantifiable (see Drucker 1986, Mitroff 1987, Graves and Waddock 1990, Porter 1992). Decisions made by fund managers, thus, reflect a response to the organisational pressures as well as the manager's own desires for job security and advancement.

Fund managers, according to the myopic theory, act like arbitragers to 'churn' or frequently turn over their portfolio of stocks in order to capitalise on all possible short-term gains (see Shleifer and Vishny 1990). Specifically, if a stock in an institution's portfolio shows poor signs of performance, the safe thing for a fund manager to do, it is argued, is sell out and purchase a more favourable stock. The alternative is to run the risk of further worsening with the institution becoming 'locked in' to a declining stock (see e.g. Hill et al. 1988). This phenomenon is often noted in the popular press as shuttling in and out of stocks in response to short-term corporate earning reports. Offloading of poorly performing stocks is particularly high during the end of a quarter (Lakonishok et al. 1991).

Short-term shuttling on the part of institutions implies that the degree of volatility in a firm's share price will be a function of the level of institutional holdings. When institutions hold a significant proportion of a firm's stock, the tendency to sell in response to a short-term decline in earnings can lead to a dramatic drop in the firm's share price (a firm whose market value is less than its asset value). A consequence of this is the creation of a takeover bargain (see for instance Jarrell et al. 1988 and Shleifer and Vishny 1990). Hence, share price volatility is theorised to increase the probability that a firm suffering from a short-term decline in earnings will find itself the target of a hostile takeover bid. To reduce this likelihood, advocates of the myopic institutional theory suggest that firms cut back on their long-run investments, such as expenditures on innovative activities or research and development investments, in order to inflate their short-term earnings (see for example Hayes and Abernathy 1980).

Finance theorists schooled in traditional efficient market theory (for instance Jarrell and Lehn 1985 and Jensen 1988) view short-term shuttling based on accounting elements as irrational behaviour that is practised neither by institutions nor individual shareholders. Efficient market theory put forward that shareholders are rational in the sense implied by

Bayesian decision theory. That is, shareholders are argued to base their valuation of a firm's shares on an intendedly rational assessment of all publicly available information about a firm's potential future cash flows. That being the case, rational shareholders will approve of investments that boost the future cash flows of the firm. Investments in firm innovation or enterprise activities such as research and development fall into this category. Institutional investors tend to evaluate their alternatives more carefully and hence make better investment decisions (see e.g. Aoki 1984). Given the wealth of institutional investors, they obtain scale economies in the evaluation of their investments and thus possess better knowledge about the market than individual investors (Black 1992). That is to say, institutional investors have the incentive to carry out a thorough assessment of possible long-term benefits, rather than gain from short-term fluctuations in price. Hence, if a firm could increase future cash flow through firm innovative or enterprise activities, institutional investors would encourage such behaviour.

The efficient market predicts that intendedly rational shareholders will not sell the stock of a fundamentally sound firm engaged in some measure of risk-taking that has the possibility of increased future cash flows just because that firm has reported one bad quarter. If this is the case, firm managers understand that there is no danger of institutional investors dumping the stock on the basis of transient changes in stock prices and, hence, are not afraid to make investments in innovative activities. Traditionally, finance theory has not distinguished among the owners of shares. The *efficient market theory*, drawing from traditional finance theory, does not make any distinction among different types of institutional ownership. It has, however, been argued in the literature that shareholders are distinguishable. The origins of this challenge are traced to Berle and Means (1932). Jensen and Meckling (1976) show formally how the allocation of equity among different shareholders affects firm value.

In their study, Hill and Snell (1988) hypothesized about stock concentration but made no attempt to differentiate between or among the different economic players whose stock holdings are concentrated. Similarly, Hansen and Hill (1991) and Wright et al. (1996) lumped institutional investors into a monolithic group in their study. Bushee (1998) put forward that different types of institutions have different effects on the risk-taking activities of firms. Kochhar and David (1996) find that more active institutional investors are more able to influence managers to increase new product development than less active institutions. Zahra (1996), separating

institutional investors into long-term and short-term institutional stock ownership, find that long-term institutional shareholdings have a positive effect on firm innovation. This suggests that different categories of institutional investors may pursue different goals and emphasize different objectives.

All institutions have an investment relationship with the firm in which they hold equity. However, some institutions may also have a business relationship with these firms. That is, some of the economic activity of the institutions may evolve from their investment relationships with the firm. Heard and Shepherd (1987) argue that the dual activities of investment and business relationships can create a conflict of interest for these institutions. Pound (1988) also contends that the business relationship between institutional owners and the firm affects the nature of the relationship between the two. This suggests that a classification of institutional ownership based on institutional investors' business and investment relationship with the firm would be valuable.

Contrary to his efficient-monitoring hypothesis which predicts a positive relationship between large shareholding and corporate value, Pound (1988) found that institutional shareholdings, in some circumstances, may negatively affect corporate performance. Financially lucrative relationships with the firm could force some institutional owners to vote with management on issues that are harmful to shareholders in general. For these institutions, the power gained from their ownership stake (see e.g. Zald 1969 and Finkelstein 1992) may be tampered somewhat by their dependence on the firm for business activity (see Levine and White 1961 and Cook 1977). Thus, when institutional owners are in a profitable business relationship with firms in which they have equity stakes, they may seek their parochial interest but not that of shareholders in general. They may seek to maintain an amiable business relationship and may be hesitant to influence managerial actions. An attempt to take an activist stance with respect to the firm may result in the withdrawal of the business. As these types of institutions are susceptible to managerial influence, Brickley et al. (1988) and Kochhar and David (1996) refer to them as *pressure-sensitive* institutions. *Pressure-sensitive* institutions include insurance companies, banks and non bank trusts.

Many of these *pressure-sensitive* institutions with large stakes in firms get "locked into" their investments. According to Baysinger and Butler (1985), this type of institutional investors prefer to work inside firms to change policies of the firms because the volume of share held by them makes a quick exit from the firm impractical. Nevertheless,

according to Pound's (1988) conflict-of-interest hypothesis, *pressure-sensitive* institutional owners are coerced into voting their shares with management in view of the business relationship they have with the firm. It is assumed here that the interests of *pressure-sensitive* institutional shareholders are closely aligned to that of management. Managerial objectives, including assuring job security and diversifying their own portfolios, may lead to risk reducing strategies. Hence, a negative relationship could be observed between *pressure-sensitive* institutions and firm risk-taking.

Pressure-resistant institutional investors, in contrast, have no business relationship with the firms in which they own equity stake. They only have an investment relationship with the firm and a conflict of interest is unlikely. This suggests that these institutions are more likely or able to exercise their voice over firm actions in ways that *pressure-sensitive* institutions would not. Managers in these institutions, as noted above, are under considerable pressures to perform from their superiors. Decisions made by these managers, thus, reflect a response to the organisational pressures as well as the manager's own desires for job security and advancement (see Loescher 1984, Drucker 1986, Hill et al 1988 and Mitroff 1987). Included in pressure-resistant institutions are mutual funds, pension funds, endowments, and foundations. These institutions, arguably, hold well diversified portfolios. Finance theory suggest that shareholders who hold diversified portfolio of stocks prefer high average returns on each security in the portfolio, even at the cost of higher variance, because their overall risk is reduced (Copeland and Weston 1992). Consequently, the following hypotheses are proposed for empirical examination:

*Hypothesis 1: The relationship between pressure-sensitive institutional investors and firm risk-taking will be negative.*

*Hypothesis 2: The relationship between pressure-resistant institutional investors and firm risk-taking will be positive.*

## 3. Sample construction and methodology

Generally, firms are selected from publicly traded companies in Finland satisfying two basic data requirements. First, for a firm to be included in the dataset, it is required that ownership data be available for the sample year, 2003. Data on institutional shareholdings are obtained from the respective firms' annual reports. A further requirement is that firms included in the dataset should have five consecutive fiscal years of stock market and financial statement

data, including the sample year. The final sample consists of 100 firms with 338 observations for *pressure-resistant* institutional shareholdings and 426 observations for *pressure-sensitive* institutional shareholding.

Following Bowman (1980 and 1982) and Miller and Bromiley (1990) the standard deviation of return on equity (ROE) over a five-year period is used as a proxy for income stream risk (or firm risk taking). Wright et al. (1996) used the standard deviation of analysts' forecasts of earning per share as the relevant measure of risk in their study. This measure requires that existence of many analysts following for each stock, something which is missing in many Finnish stocks. Many Finnish firms have very few analysts following which make its impossible to use analysts' forecasts. Most significantly, Miller and Bromiley (1990) suggest that the standard deviation of ROE and the standard deviation of analysts' forecasts of earning per share measure the same type of risk, namely income stream risk. Hence, it is a valid measure to adopt. Some descriptive statistics of the risk-taking variable used in this paper is presented in Table 1. The mean value of the risk variable is 14.59 with the firms having average total assets of approximately 1.26 billion euros.

### -**Insert Table 1 here**-

Institutional ownership includes a variety of organisations such as banks, non-bank trusts, insurance companies, pension funds, mutual funds, foundations, and brokerage houses. As noted above, *pressure-resistant* institutional investors include pension funds, mutual funds, endowments and foundations. The second group of firms, classified under *pressure-sensitive* institutional investors includes insurance companies, banks, and non-bank trusts. Data on institutional ownership is also gathered from the respective firms' annual reports. Table 2 presents some summary statistics on institutional ownership. The mean shareholding for the institutional investors considered here is 2.75% (2.5% and 2.96% for *pressure resistant* and *pressure sensitive* institutional investors respectively). The least shareholding is 0.01% and the highest 40.07%.

### -**Insert Table 2 here**-

The methodology employed here to examine the impact of institutional investors on risk-taking is a cross-sectional regression analysis in which firm risk-taking is regressed against different classes of institutional shareholding. The selection of the control variables used here is dictated by the literature and data availability. We control for size, leverage, investments, liquidity, and industry effects. It has often been argued that size should be negatively related to ownership since it is harder to own the

same percentage in a large firm as compared to a small firm. Firm size effect is captured by total assets. The pecking order theory suggests a negative relationship between various measures of firm performance and leverage. We use the ratio of total debts to assets as a proxy for leverage. Capital expenditures (scaled by total assets) can proxy for investment that should positively affect performance. This variable is included as a control variable to take into account the possible influence of investment on ownership. We also control for liquidity. Cash flow (divided by total assets) is used as a proxy for liquidity. Dummy variables are used here to capture the influence of industries. The industrial classification used by Helsinki Exchange (HEX) is adopted here. The HEX categorises firms into nine (9) industrial classifications. The following model is estimated to test hypotheses:

(1)

$$Risk_{i,t} = \alpha_0 + \alpha_1 OWN_{i,t}^k + \alpha_2 FS_{i,t} + \alpha_3 LEV_{i,t} + \alpha_4 INV_{i,t} + \alpha_5 LIQ_{i,t} + \alpha_6 d_{i,t}^1 +$$

$$\alpha_6 d_{i,t}^2 + \alpha_6 d_{i,t}^3 + \alpha_6 d_{i,t}^4 + \alpha_6 d_{i,t}^5 + \alpha_6 d_{i,t}^6 + \alpha_6 d_{i,t}^7 + \alpha_6 d_{i,t}^8 + \varepsilon_{i,t}$$

where $Risk_{i,t}$ is the risk measure for firm $i$ at time $t$; $OWN_{i,t}^k$ is the level of share ownership for firm $i$ at time $t$, where $k=1$ all institutional shareholding, $k=2$ for pressure sensitive institutional shareholding, and $k=3$ for pressure-resistant institutional shareholding; $FS_{i,t}$ is firm size (logarithm of total assets) for firm $i$ at time $t$; $LEV_{i,t}$ is leverage measured as the ratio of total debts to total assets for firm $i$ at time $t$; $INV_{i,t}$ is investment measured by capital expenditures scaled by total assets for firm $i$ at time $t$; $LIQ_{i,t}$ is liquidity measured by cash flows scaled by total assets for firm $i$ at time $t$; $d_{i,t}^1$ is firm $i$ classified in industry 1 (information technology) at time $t$; $d_{i,t}^2$ is firm $i$ classified in industry 2 (industrials) at time $t$; $d_{i,t}^3$ is firm $i$ classified in industry 3 (consumer discretionary) at time $t$; $d_{i,t}^4$ is firm $i$ classified in industry 4 (consumer staples) at time $t$; $d_{i,t}^5$ is firm $i$ classified in industry 5 (materials) at time $t$; $d_{i,t}^6$ is firm $i$ classified in industry 6 (health care) at time $t$; $d_{i,t}^7$ is firm $i$ classified in industry 7 (real estate) at time $t$; $d_{i,t}^8$ is firm $i$ classified in industry 8

(telecom) at time $t$; $d_{i,t}^9$ is firm $i$ classified in industry 9 (utilities) at time $t$; $\varepsilon_{i,t}$ is the error term.

The regression model in equation (1) is estimated using ordinary least squares regressions. When the null hypothesis of homoscedasticity is rejected, White (1980) heteroscedasticity-consistent asymptotic covariance matrix is used. These estimates are used to compute heteroscedasticity-consistent $t$-statistics that are needed to calculate the probability values of the coefficients.

## 4. Empirical results and discussion

Table 3 contains the results of the regression models estimating the effects of institutional ownership on firm risk-taking. When institutional investors are considered as a monolithic group, the results indicate a positive relationship between the level of ownership by institutions and firm risk-taking. This result is consistent with earlier studies that indicate a positive relationship between institutional investors and corporate risk-taking (see for instance Barclay and Holderness 1990, Hansen and Hill 1991, Wright et al 1996, Zahra 1996).

-Insert Table 3 here-

The main contention in this paper is that a disaggregated group will reveal different relationships between institutional shareholding and firm risk taking. Table 3 also contains the results of the regression models investigating the relationship between *pressure-sensitive* institutional investors and *pressure-resistant* institutional investors on firm risk-taking. The results indicate a divergent relationship between the two groups of institutional investors and firm risk taking. *Pressure-sensitive* institutional investors relates negatively to firm risk taking. The coefficient for this variable is negative and statistically significant. Hypothesis 1 is therefore supported. As noted by Pound's (1988) conflict-of-interest hypothesis, pressure-sensitive institutional owners are coerced into voting their shares with management in view of the business relationship they have with the firm. That result in risk reducing strategies pursued by firm management and such strategies are forced on this class of shareholders. These shareholders also have the option of offloading the stocks.

In hypothesis 2 a positive relationship between *pressure-resistant* institutional investors and firm risk-taking is proposed. The coefficient of *pressure-resistant* institutional ownership is positive and statistically significant. That is to say, *pressure-resistant* institutional investors exert positive and measurable influence on firm risk-taking. Hypothesis

2 is, therefore, supported. The evidence presented for this group of institutional investors favours Pound's (1988) efficient monitoring hypothesis and not his conflict-of-interest hypothesis. Furthermore, finance theory suggest that shareholders who hold diversified portfolio of stocks prefer high average returns on each security in the portfolio, even at the cost of higher variance, because their overall risk is reduced (Copeland and Weston 1992). The results presented for this group, therefore, supports finance theory.

Tables 3 also report results for the control variables. In Table 3, the coefficient for firm size is shown to be statistically significant and consistently negative. Leverage and firm investments are found not to exert and measurable effects on the proposed relationships. The firm's liquidity situation is found to be negatively related firm risk-taking when the model is estimated for all institutional shareholding and *pressure-sensitive* institutional shareholding but not *pressure-resistant* institutional shareholding. The industry effects are shown to be largely insignificant and the sign of the coefficients inconsistent. That is, their statistical significance and sign of the coefficients vary.

## 4. Conclusion

The paper empirically examines the impact of institutional investors with both investment and business relationships with the firm (termed *pressure-sensitive*) and institutional investors with only a business relationship with the firm (termed *pressure-resistant*) on firm risk-taking. We define risk-taking as the analysis and selection of projects that have varying uncertainties associated with their expected outcomes and corresponding cash flows. Our focal point for risk-taking is, thus, the firm income stream risk. Cross-sectional analyses are conducted with a sample of publicly listed Finnish firms for the year 2003. Prior research has considered institutional investors as a homogeneous group. To mirror the results from prior studies, we examine the effect of institutional investors as a homogeneous group on firm risk taking. Consistent with that of prior studies, we find a positive relationship between institutional shareholding and risk-taking. The underlying contention of this paper is that disaggregating shareholders reveal important relationships for different categories of shareholders. Hypothesis 1 posits a negative relationship between *pressure-sensitive* institutional shareholding and firm risk-taking. This group of institutional shareholders have both investment and business relationship with the firm in which they have an equity stake. The results, therefore, support Hypothesis 1. We suggest that

pressure-sensitive institutional owners may be coerced into voting their shares with management in view of the business relationship they have with the firm. That result in risk reducing strategies pursued by firm management and such strategies are forced on this class of shareholders.

In hypothesis 2, a positive relationship between *pressure-resistant* institutional investors and firm risk-taking is proposed. The results from estimating equation (1) for this category of institutional investors support this hypothesis. The results reported in Table 3 indicate a positive and statistically significant relationship between firm risk-taking and *pressure-resistant* institutional investors. Hypothesis 2 is therefore supported. This class of institutional shareholders may have well diversified portfolio and because they do not depend on the firm for business the may purely push for high average returns on each security in the portfolio, even at the cost of higher variance, because their overall risk is reduced.

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## Appendices

**Table 1.** Summary statistics: Firm risk-taking and firm size

| Variable | Mean | Median | Standard Deviation | Minimum | Maximum |
|---|---|---|---|---|---|
| Risk | 14.59 | 8.30 | 28.55 | 0.28 | 264.04 |
| Firm size[a] | 1257 | 102.13 | 3681.62 | 4.15 | 23177 |

Total sample include 100 firms in nine industries

[a] Total assets, millions of Euros

**Table 2.** Summary statistics: Level of institutional ownership (percentages)

| Variable | Mean | Median | Mode | STDEV | Min. | Max. | No. of observations |
|---|---|---|---|---|---|---|---|
| Institutional shareholdings (All) | 2.75 | 1.3 | 0.2 | 5.67 | 0.01 | 40.07 | 764 |
| Pressure-resistant | 2.50 | 1.1 | 0.4 | 5.14 | 0.09 | 39.33 | 338 |
| Pressure-sensitive | 2.96 | 1.4 | 0.2 | 6.06 | 0.01 | 40.07 | 426 |

**Table 3.** Results of cross-sectional regression analysis: Effect of institutional investors on firm risk-taking

| | All Institutions Shareholding | | Pressure Sensitive Shareholding | | Pressure Resistant shareholding | |
|---|---|---|---|---|---|---|
| Intercept | 28.97 | (0.015)*** | 35.21 | (0.0028)* | 54.13 | (0.038)*** |
| OWN | 1.68 | (0.0000)* | -0.41 | (0.085)**** | 2.17 | (0.0000)* |
| FS | -4.05 | (0.0000)* | -3.86 | (0.0012)* | -4.95 | (0.0004)* |
| LEV | -1.96 | (0.83) | 15.13 | (0.24) | -16.38 | (0.29) |
| INV | 0.12 | (0.322) | 0.21 | (0.21) | 0.06 | (0.77) |
| LIQ | -2.19 | (0.016)*** | -2.45 | (0.037)*** | -2.03 | (0.16) |
| D1 | 13.11 | (0.23) | 3.57 | (0.57) | -3.60 | (0.87) |
| D2 | 0.29 | (0.97) | -4.27 | (0.36) | -17.41 | (0.45) |
| D3 | -1.43 | (0.89) | -9.39 | (0.06)**** | -19.21 | (0.41) |
| D4 | -0.36 | (0.97) | -9.73 | (0.09)**** | -15.23 | (0.52) |
| D5 | 8.81 | (0.43) | -2.13 | (0.47) | -5.37 | (0.81) |
| D6 | -1.71 | (0.89) | -3.69 | (0.35) | -21.93 | (0.46) |
| D7 | 60.03 | (0.0000)* | -14.51 | (0.01)** | -11.75 | (0.63) |
| D8 | 12.43 | (0.41) | 31.92 | (0.045)*** | 71.34 | (0.0057)** |
| | | | | | | |
| Adjusted $R^2$ | 0.20 | | 0.16 | | 0.25 | |
| F-Value | 15.96 | (0.0000)* | 6.96 | (0.0000)* | 9.48 | (0.0000)* |

Regression analysis,
model:

$$Risk_{i,t} = \alpha_0 + \alpha_1 OWN_{i,t}^k + \alpha_2 FS_{i,t} + \alpha_3 LEV_{i,t} + \alpha_4 INV_{i,t} + \alpha_5 LIQ_{i,t} + \alpha_6 d_{i,t}^1 + \alpha_6 d_{i,t}^2 + \alpha_6 d_{i,t}^3 + \alpha_6 d_{i,t}^4 + \alpha_6 d_{i,t}^5 + \alpha_6 d_{i,t}^6 + \alpha_6 d_{i,t}^7 + \alpha_6 d_{i,t}^8 + \varepsilon_{i,t},$$

where $Risk_{i,t}$ is risk measure for firm $i$ at time $t$; $OWN_{i,t}^k$ is the level of institutional share ownership for firm $i$ at time $t$, where $k$ =1 all institutional shareholding, $k$ =2 for pressure sensitive institutional shareholding, and $k$ =3 for pressure-resistant institutional shareholding; $FS_{i,t}$ is firm size (logarithm of total assets) for firm $i$ at time $t$; $LEV_{i,t}$ is the ratio of total debts to total assets for firm $i$ at time $t$; $INV_{i,t}$ is capital expenditures scaled by total assets for firm $i$ at time $t$; $LIQ_{i,t}$ is cash flows scaled by total assets for firm $i$ at time $t$; $d_{i,t}^1$ to $d_{i,t}^8$ are industry dummy variable; and $\varepsilon_{i,t}$ is error term. Probability values are in parentheses: * significance at 0.1%; ** significance at 1%, *** significance at 5%; **** significance at 10%. When the null hypothesis of homoscedasticity is rejected in the regression analysis, White (1980) heteroscedasticity-consistent asymptotic covariance matrix is used.