# Relationship between Ownership Concentration and Information Asymmetry on Listed Companies at Tehran Stock Exchange

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**ABSTRACT:** This study examines the relationship between ownership concentration and information asymmetry of listed companies in Tehran Stock Exchange. In line with this goal, all listed companies in Tehran Stock Exchange which had presented financial statements (balance sheet, profit and loss statement) required information in the years 2006 to 2010 were studied. In total, 404 companies were selected in different industries. To test the hypotheses multivariate regression (Inter method) was used and their significance was examined using t- and F statistics. Also Durbin - Watson test was used to test the model autocorrelation. The research results show that there is no significant relationship between ownership concentration and information asymmetry.

**Key Words:** Concentration of Ownership, Information Asymmetry, Institutional Shareholder, the Biggest Shareholder

## INTRODUCTION

One of the conditions of perfect competition is information transparency and the lack of it leads to the rise of rent. According to North Douglass moving from the traditional society to a modern society will increase the level of information asymmetry, because the more advanced a society, the more division of labor and specialization will be. Diversifying production and increasing specialization and division of labor give rise to information asymmetry. When the asymmetry of information about a company's stock rises, the intrinsic value of it will be different from the value that investors consider for the stock in the capital market. As a result, the actual value of the stocks of the Companies will differ from shareholders' expected value.

Based on the theory of Jensen and Mackling the basis of corporate governance studies is agency theory and the agency issues are resulted from separation of ownership from control. In public companies, the stakeholders (employers) delegate decision-making authority to managers (agents). This means that ownership is separated from control albeit to varying degrees. This separation has led to discuss about the relationship between owners and managers. To what extent managers put their efforts, as financial theory proposes, in the interests of owners. Ownership structure in public companies can be dispersed (there are a large number of small shareholders) or concentrated (there are a few major shareholders). When the major shareholders have the ownership, control system is concentrated and when the ownership is dispersed, control system will be decentralized. The major shareholders are those legal or individual shareholders who have a minimum of 5% of the company's stock. They can be classified into the company's inside shareholders, outside shareholders and institutional investors. The presence of major shareholders creates strong differences between the owners and the managers. Institutional Investors is a person or corporation who engages in buying and selling large amounts of securities. From theoretical point of view, the role of institutional investors in corporate governance is very complex. From another viewpoint, institutional investors represent another strong corporate governance mechanism that could monitor the Company's management as well as could align the interests of shareholders group.

### A review on research literature

In this section, a number of internal and external researches related to the topic of the investigation are expressed.

Jiang et al. [1] examined the relationship between the concentration of ownership, information asymmetry and voluntary disclosures in New Zealand companies. They investigated the relationship between the concentration of ownership and information asymmetry and the relationship between the concentration of ownership and voluntary disclosures in two main hypotheses. Research results showed that there is a significant

relationship between the degree of ownership concentration and information asymmetry and voluntary disclosure of corporations.

Baba [2] reviewed the effect of outside shareholders increasing on the dividend policy. The research results showed that further increase of outside shareholders ownership leads to higher (lower) likelihood of increase (decrease) in dividends and actually causes a decrease (increase) in the information asymmetry between managers and the shareholders.

Salehi et al. [3] in a research entitled a study on the impact of corporate governance on the relationship between ownership concentration and information asymmetry in Tehran Stock Exchange for a 5-year period (2006-2010), examined a sample of 133 companies using regression model and combination panel data method. The obtained research results confirmed the direct and significant relationship between ownership concentration and information asymmetry in VOX. So that by increasing concentration of ownership information asymmetry will be added.

Sarbandi Farahani et al. [4] in a study examined the relationship between ownership concentration and information asymmetry in firms listed in Tehran Stock Exchange which were seventy-four stock companies for a 5- year period ( from 2005 to 2009). The results of testing the research hypotheses indicated that there is a direct and positive relationship between the level of ownership concentration and information asymmetry.

Fakhari and Tahiri [5] in a review entitled the investigation of the relationship between institutional investors and stock return volatility of the listed companies in Tehran Stock Exchange examined 131 stock companies in the fiscal year of 2008 which were selected as the research sample. The research findings suggest that the presence of institutional investors increases monitoring the managers' performance and reduces information asymmetry.

The main theory: There is a significant relationship between ownership concentration and information asymmetry of the companies.

Given the above hypothesis the following sub-hypotheses can be determined:

Sub-hypothesis 1: There is a significant relationship between institutional shareholders ownership amount and information asymmetry of the companies.

Sub-hypothesis 2: There is a significant relationship between the biggest shareholder ownership amount and information asymmetry of the companies.

## MATERIALS AND METHODS

To test the assumptions regression analysis is used, to test the model significance F test is utilized and t test was applied for coefficients significance testing. To test the hypotheses the method of time series and cross-sectional (panel data) data combination is used, to test autocorrelation Durbin- Watson was utilized and Kolmogorov - Smirnoff test used to assess normality of research variables distributions and each of the research variables is tested at 5% error level.

The research first model, which is derived from the model of Jiang et al. [1] to assess the relationship between ownership concentration and information asymmetry, is as follows:

**$SBAS_{it} = \beta_0 + \beta_1 H_{it} + \beta_2 AAV_{it} + \beta_3 \ln(MKVAL_{it}) + \beta_4 LPRICE_{it} + e_{it}$**

Where:
**$SBAS_{i,t}$ =** assessment criterion for information asymmetry of firm i in year t
**$H_{i,t}$ =** Herfindahl - Hirschman index to measure the amount of ownership concentration of firm i in year t
Control variables in the model:
**$AAV_{i,t}$ =** stock abnormal trading volume (Abnormal volume)
**$\ln(MKVAL_{i,t})$=** assessment criterion for firm size equal to natural logarithm of the market value of assets of firm i in year t
**LPRICE =** natural log of stock value of firm i at the end of fiscal year t

The research model 2, which is derived from the model of Jiang et al. [1] with some modifications to assess the relationship between institutional ownership and information asymmetry, is as follows:

**$SBAS_{it} = \beta_0 + \beta_1 Inist_{it} + \beta_2 AAV_{it} + \beta_3 \ln(MKVAL_{it}) + \beta_4 LPRICE_{it} + e_{it}$**

Where:
**$Inist_{i,t}$ =** total ownership percentage of legal shareholders
The research model 3, which is derived from the model of Jiang et al. [1] with some modifications to assess the relationship between the biggest shareholder ownership and information asymmetry, is as follows:
**$SBAS_{i,t} = \beta_0 + \beta_1 BIG_{it} + \beta_2 AAV_{it} + \beta_3 \ln(MKVAL_{it}) + \beta_4 LPRICE_{it} + e_{it}$**
Where:
**$BIG_{i,t}$=** Ownership percentage of the biggest shareholder of each company

**How to calculate variables**

❖ Information asymmetry (SBAS): information asymmetry is a qualitative concept and to calculate it ask price and bid price domain of stocks is used. The model is as follows.

$$\text{SBAS}_{it} = \frac{(AP - BP)}{\frac{(AP+BP)}{2}} \times 100$$

Where:

**SBAS=** difference domain of ask price and bid price of stocks which is a measure of information asymmetry in this study.

**(ASK PRICE) AP=** in i studied period ask price mean of the firm stock

**(BID PRICE) BP=** in i studied period bid price mean of the company

Ownership concentration (H): In this study, Herfindahl - Hirschman index (Herfindahl-Hirschman) is used to calculate the ratio of ownership concentration. This index is obtained from the sum of the square of stock percent owned by shareholders. The index increases in parallel with the increasing of ownership concentration and in the condition that the whole stock is owned by one person, the maximum value is assigned to it and it is calculated equivalent to 10,000 units. If the ownership structure is dispersed and all shareholders have equal ratios, HHI has the minimum value and it is calculated equivalent to 10000 / N. Herfindahl index is calculated as follows:

$$\text{HHI}_t = \sum_{i=1}^{n} \left( \frac{P_i}{P} \times 100 \right)^2$$

Stock abnormal trading volume (Abnormal volume) (AAV): To find the abnormal trading volume, the following regression is executed between the company stock trading volume and the total market trading volume in observation (event) weeks.

VOL = B0 + B MVOL it + ε 0

**The population and sampling method**

The research population included all companies listed in Tehran Stock Exchange. To determine the study sample the companies are chosen from the mentioned population that:

Their fiscal year is ended at March of each year.

The company has no fiscal year change from 2006 to 2010.

Company is not in financial intermediaries (Banks, institutions, investments and ...).

Needed information about the company is available.

## RESULTS

**Descriptive Statistics**

As can be seen in Table 1 variable of ownership concentration (HHI), for the measurement of which the Herfindahl - Hirschman index is used when the index can be a number from 0 to 10000, in this study has the average of 4613 that its minimum is 851.85 and the maximum is 10,000. Variable of information asymmetry (SBAS) has the average of 11.07 that its minimum is zero and the maximum is 62.99. In this study firm size (ln $(MKVAL_{it})$), for which the logarithm of the market value of assets is used, has the average of 5.56 that its minimum is 4.27 and the maximum is 7.66. According to research conducted in Iran, the sample companies of this study are almost middle-sized.

**Table 1.** Descriptive statistics (All figures are in Million Rials)

| Observations No. | Observations No. | Min | Max | Mean | Standard Deviation | Variance |
|---|---|---|---|---|---|---|
| $H_i$ | 404 | 851.85 | 10000 | 4613 | 1996.22 | 3.98 |
| $(MKVAL_{it})$ln | 404 | 4.27 | 7.66 | 5.5611 | 0.55463 | 0.308 |
| LPRICE | 404 | 4.325 | 7.31 | 5.432 | 0.57124 | 0.295 |
| Inist $_{it}$ | 404 | 0.05 | 0.87 | 0.48 | 0.021 | 0.52 |
| SBAS | 404 | 0 | 62.99 | 11.9717 | 7.47255 | 55.839 |
| Valid N (listwise) | 404 | | | | | |

**Table 2.** The statistic and significance level of Kolmogorov - Smirnov test

| VARIABLE | SBAS |
|---|---|
| **Observations No.** | 404 |
| **Kolmogorov – Smirnov Statistic Amount** | 2.079 |
| **Significance Level** | 0.0728 |

Table 2 shows that significance level for Kolmogorov-Smirnov test for the variable of information asymmetry (SBAS) as dependent variables of the study were more than 5 %. Therefore, these variables are normally distributed. Parametric tests are used to test hypotheses given that the dependent variable of the study has a normal distribution for data analysis, and hypotheses testing.

**Hypotheses Testing**
**Hypothesis 1:** There is a significant relationship between ownership concentration and information asymmetry of the companies.
To measure hypothesis 1 in this study the following regression model is used:
$SBAS_{it} = \beta_0 + \beta_1 H_{it} + \beta_2 AAV_{it} + \beta_3 ln(MKVAL_{it}) + \beta_4 LPRICE_{it} + e_{it}$

**Assumption of errors independence**
To test the independence of the errors from each other Durbin- Watson test is used. As can be seen in Table 3 the Durbin - Watson obtained value is 1.869 which is between 1.5 and 2.5. As a result the assumption of errors independence is accepted.

**Table 3.** Model Summary

| Model | Correlation Coefficient | Determination Coefficient | Adjusted Determination Coefficient | Estimation Standard Error | Durbin-Watson |
|---|---|---|---|---|---|
| **1** | 0.259a | 0.067 | 0.054 | 0.385984 | 1.869 |

As can be seen in Table 3 the obtained correlation coefficient is 0.25, which indicates a good correlation between independent variables and dependent variable. The obtained standard determination coefficient is 0.067. Consequently, only about 6% of the variation in the dependent variable of the model is due to changes in the independent variables of the model. In other words, only 6 % of the variation in information asymmetry level of the companies is resulted from the model independent variables.

**Existence of a linear relationship between the independent variables and dependent variable**
To test the existence of a linear relationship between the independent and dependent variables Fisher F parametric test as well as ANOVA analysis is used in this study. As can be seen in Table 4 F -test significance level is less than 5% (zero). As a result based on the following table the assumption of the existence of a linear relationship between the dependent and independent variables and the existence of a linear relationship in the research model is verified.

**Table 4.** Variance Analysis

| Model | | Sum of Squares | Freedom Degree | Squares Average | F | Significant |
|---|---|---|---|---|---|---|
| **1** | Regression | 5.343 | 7 | 0.763 | 5.124 | 0.000a |
| | Remainder | 74.045 | 497 | 0.149 | | |
| | Sum | 79.388 | 504 | | | |

**A review on the estimated coefficients significance of the research model**
Table 5 shows that the estimated coefficient for the variable of ownership concentration (HHI) is equal to 1.58 that given the significance column it is observed that the estimated coefficient is not statistically significant at the 95% confidence level. Its significance is 0.765 and this number is greater than 5% error level adopted in this research. So the existence of any significant relationship between information asymmetry and ownership concentration of companies at 95 % confidence level is not verified.

**Table 5.** The Model Variables Coefficients

| | Variables | Non-standardized Coefficient | | Standardized Coefficient | t | Significance | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|
| | | **B** | **Std. Error** | **Beta** | | | **Tolerance** | **VIF** |
| **1** | (Constant) | -0.388 | 0.214 | | -1.817 | 0.070 | | |
| | HHI | 1.58 | 0.000 | .011 | 0.299 | 0.765 | 0.951 | 1.051 |
| | AAV$_{it}$ | -0.110 | 0.086 | -.057 | -1.285 | 0.199 | 0.969 | 1.032 |
| | Ln(MKVAL$_{it)}$ | 0.055 | 0.035 | .077 | 1.559 | 0.021 | 0.774 | 1.292 |
| | LPRICE$_{it}$ | 0.107 | 0.019 | .248 | 5.681 | 0.000 | 0.982 | 1.019 |
| a. Dependent Variable: SBAS | | | | | | | | |

Also the above table indicates that the estimated coefficient for abnormal trading volume (AAV) is equal to -0.111. With regard to the significance column it can be observed that the estimated coefficient is not significant at the 95% confidence level (Significance of this coefficient is equal to 0.199, which is greater than 5 %). Therefore, the existence of any significant relationship between abnormal trading volume and information asymmetry of companies at 95 % confidence level is not verified.

**Sub-hypothesis 1:** There is a significant relationship between institutional shareholders ownership and information asymmetry of the companies.

To measure the sub- hypothesis 1 of this study the following regression model is used:

SBASit = β0 + β1Inist it + β2AAVit + β3ln (MKVALit) + β4LPRICEit + eit

**Assumption of errors independence**

As can be seen in Table 6 the Durbin - Watson obtained value is 1.767 which is between 1.5 and 2.5. As a result the assumption of errors independence is accepted.

**Table 6.** Summary of model 2

| Model | Correlation Coefficient | Determination Coefficient | Adjusted Determination Coefficient | Estimation Standard Error | Durbin-Watson |
|---|---|---|---|---|---|
| **2** | 0.925a | 0.856 | 0.853 | 0.146990 | 1.767 |

As can be seen in Table 6 the obtained correlation coefficient is 0.925, which indicates a high correlation between independent variables and dependent variable. The obtained standard determination coefficient is 0.856. Consequently, only about 86% of the variation in the dependent variable of the model is due to changes in the independent variables of the model 2.

**Existence of a linear relationship between the independent variables and dependent variable in model 2**

To check the linearity of the relationship between the independent and dependent variables of the study the analyses of the ANOVA table and F-Fisher test are utilized. As can be seen in Table 7, which is the software output, the F-test significance level is less than one percent (zero). Therefore, according to this table the assumption of the existence of a linear relationship between the dependent and independent variables, and the existence of a linear relationship in model 2 is confirmed.

**Table 7.** ANOVAb

| | Model | Sum of Squares | Freedom Degree | Squares Average | F | Significant |
|---|---|---|---|---|---|---|
| **2** | Regression | 54.683 | 7 | 7.812 | 361.561 | 0.000a |
| | Remainder | 9.226 | 427 | .022 | | |
| | Sum | 63.909 | 434 | | | |

**A review on the estimated coefficients significance of the research model**

Table 8 shows that the estimated coefficient for the variable of institutional shareholder ownership (Inist) is equal -0.181. Due to the coefficients significance and 95% confidence level it can be seen that the estimated coefficient for the institutional shareholder ownership (Inist) is not significant. So the first sub-hypothesis regarding the significance of the relationship between institutional shareholder ownership and information asymmetry was not confirmed.

**Table 8.** The Model Variables Coefficients

| | Variables | Non-standardized Coefficient | | Standardized Coefficient | t | Significance | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|
| | | **B** | **Std. Error** | **Beta** | | | **Tolerance** | **VIF** |
| **2** | (Constant) | -0.055 | 0.011 | | -4.928 | 0.000 | -0.055 | 0.011 |
| | Insist | -0.181 | 0.121 | -0.071 | -1.493 | 0.136 | -0.181 | 0.121 |
| | AAV$_{it}$ | 0.934 | 0.025 | 0.927 | 38.031 | 0.000 | 0.934 | 0.025 |
| | ln(MKVAL$_{it}$) | 0.197 | 0.158 | 0.034 | 1.250 | 0.212 | 0.197 | 0.158 |
| | LPRICE$_{it}$ | -0.045 | 0.016 | -0.059 | -2.755 | 0.006 | -0.045 | 0.016 |
| a. Dependent Variable: SBAS | | | | | | | | |

Also the above table indicates that the estimated coefficient for abnormal trading volume (AAV) is equal to 0.934. With regard to the significance column it can be observed that the estimated coefficient is not significant at the 95% confidence level (significance of this coefficient is equal to zero, which is less than 5 %). Therefore, the existence of a significant relationship between abnormal trading volume and information asymmetry of companies at 95 % confidence level is verified.

**Sub-hypothesis 2:** There is a significant relationship between the biggest shareholder ownership and information asymmetry of the companies.

To measure the sub- hypothesis 2 of this study the following regression model is used:

SBASit = β0 + β1BIG it + β2AAVit + β3ln (MKVALit) + β4LPRICEit + eit

## Assumption of errors independence

As can be seen in Table 4-9 the Durbin - Watson obtained value is 2.039 which are between 1.5 and 2.5. As a result the assumption of errors independence is accepted.

**Table 9.** Summary of model 3

| Model | Correlation Coefficient | Determination Coefficient | Adjusted Determination Coefficient | Estimation Standard Error | Durbin-Watson |
|---|---|---|---|---|---|
| **3** | 0.061a | 0.004 | -0.008 | 0.000270 | 2.039 |

As can be seen in Table 9 the obtained correlation coefficient is 0.061, which indicates a very weak correlation between independent variables and dependent variable in model 3 of the research. The obtained standard determination coefficient is 0.004. Consequently, about 0.004% of the variation in the dependent variable of the model is due to changes in the independent variables of the model 3.

## Existence of a linear relationship between the independent variables and dependent variable in model 3

To test the existence of a linear relationship between the independent and dependent variables Fisher F as well as ANOVA analysis is used. As can be seen in Table 10, which is the software output, the F-test significance level is less than one percent (0.899). Therefore, according to this table the assumption of the existence of a linear relationship between the dependent and independent

**Table 10.** ANOVAb

| | Model | Sum of Squares | Freedom Degree | Squares Average | F | Significant |
|---|---|---|---|---|---|---|
| **3** | Regression | 0.000 | 5 | 0.000 | 0.323 | 0.899a |
| | Remainder | 0.000 | 429 | 0.000 | | |
| | Sum | 0.000 | 434 | | | |

## A review on the estimated coefficients significance of the research model

Table 11 shows that the estimated coefficient for the variable of the amount of the biggest shareholder ownership (BIG) is equal to 0.977 that given the significance column it is observed that the estimated coefficient is not statistically significant at the 95% confidence level. Its significance is 0.075 and this number is greater than 5% error level adopted in this research. So the existence of any significant relationship between information asymmetry and the amount of the biggest shareholder ownership of companies at 95 % confidence level is not verified.

Also the above table indicates that the estimated coefficient for abnormal trading volume (AAV) is equal to 0.061. With regard to the significance column it can be observed that the estimated coefficient is significant at the 95% confidence level (Significance of this coefficient is equal to 0.019, which is less than 5 %). Therefore, the existence of a significant relationship between abnormal trading volume and information asymmetry of companies at 95 % confidence level is verified.

**Table 11.** Coefficients of model variables

| | Variables | Non-standardized Coefficient | | Standardized Coefficient | t | Significance | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|
| | | **B** | **Std. Error** | **Beta** | | | **Tolerance** | **VIF** |
| **3** | (Constant) | 0.068 | 0.015 | | 4.459 | 0.000 | | |
| | BIG | 0.977 | 0.079 | 0.637 | 12.436 | 0.075 | 0.951 | 1.051 |
| | AAV$_{it}$ | 0.061 | 0.026 | 0.131 | 2.355 | 0.019 | 0.969 | 1.032 |
| | Ln(MKVAL$_{it}$) | -0.389 | 0.129 | -0.201 | -3.021 | 0.003 | 0.774 | 1.292 |
| | LPRICE$_{it}$ | 0.107 | 0.019 | 0.248 | 5.681 | 0.000 | 0.982 | 1.019 |
| a. Dependent Variable: SBAS | | | | | | | | |

## DISCUSSION

**Hypothesis 1:** There is a significant relationship between ownership concentration and information asymmetry of the companies.

The results of this study indicate that this hypothesis is unconfirmed in the present research population; because in the research model the estimated coefficient for ownership concentration of the companies, which is shown by Hi symbol, is not significant at the 95% confidence level (its error level is 0.765, which is more than 0.05). This means that there is no significant relationship between ownership concentration and information asymmetry of the companies and the first research hypothesis is not verified. The research findings are not consistent with the studies of Jiang et al. [1] and Sarbandi Farahani et al. [4] and Salehi [3].

**Sub-hypothesis 1:** the level of institutional shareholder ownership and information asymmetry firms there is a significant relationship

According to the research findings it can be seen that the coefficient of institutional shareholder ownership concentration (Insist) in model 2 of the study, which is used to evaluate sub-hypothesis 1 of the research, is equal to -1.18 and has a significance level (sig) equal to 0.136 that is greater than 5%. So this coefficient is not significant and the first sub- hypothesis is not confirmed. The result of this hypothesis is consistent with the research results of Fakhari and Taheri [5]. But it is not consistent with the studies of Sarbandi Farahani et al. [4] and Salehi [3].

**Sub-hypothesis 2:** There is a significant relationship between the biggest shareholder ownership amount and information asymmetry of the companies.

According to the research findings it can be seen that the coefficient of the biggest shareholder ownership (BIG) in research model of the study, which is used to evaluate sub-hypothesis 2 of the research, is equal to 0.977 and has a significance level (sig) equal to 0.075 that is greater than 5%. So this coefficient is significant. Therefore, the second sub-hypothesis is not confirmed. The result of this hypothesis is consistent with the research results of Baba [2] and Fakhari and Taheri [5]. But it is not consistent with the studies of Sarbandi Farahani et al. [4].

In table 12 the summary of research hypotheses test results are presented

**Table 12.** Summary of hypotheses test results

| The obtained result from the research | Hypothesis | Hypothesis No. |
|---|---|---|
| **Rejected** | There is a significant relationship between ownership concentration and information asymmetry of the companies. | Main Hypothesis 1 |
| **Rejected** | There is a significant relationship between institutional shareholders ownership amount and information asymmetry of the companies. | Sub-hypothesis 1 |
| **Rejected** | There is a significant relationship between the biggest shareholder ownership amountand information asymmetry of the companies. | Sub-hypothesis 2 |

According to the result of the first main hypothesis of the study based on the lack of a significant relationship between ownership concentration and information asymmetry, shareholders are recommended to invest in companies with lower ownership concentration. This will reduce the information asymmetry and help them to make decisions about investment.

According to the result of the first sub- hypothesis of the study based on the lack of a significant relationship between institutional shareholders ownership and information asymmetry it can be deduced that institutional investors are the main actors in the capital markets. Using their ability is a function of the amount of their investment. It is recommended that the Companies and the Stock Exchange of Tehran do not use the method of institutional shareholders ownership decrease to reduce information asymmetry.

According to the result of the second sub-hypothesis of the study based on the lack of a significant relationship between the ownership of the biggest shareholder and information asymmetry it can be deduced that the existence of information asymmetry in the market causes negative individual and collective consequences such as minimalistic participation of investors. Therefore, Tehran Stock Exchange and the companies are recommended not to be sensitive about the ownership by too big shareholders and not withhold them, because they have no impact on reducing the information asymmetry between managers and shareholders

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