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# In the Name of God

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# Structure of second page until the end of manuscript is as follow:

- *Introduction* Some paragraphs contain explaining the problem, literature review, object (purpose), importance and necessity of it.
- Literature review A review of the literature investigates only related researches chronologically and the results exploit at the end of the section theory matrix or conceptual model that document research variables and Formulate research hypotheses.
- *Methodology* including Methods, data collection tools, population, sample size and sampling methods, analysis and model testing hypothesis, definition of study variables and operational definition of them can be in presented the same section that model testing is represented and there is no need to repeat.
- *Results* including the findings compare it with the findings of previous and interpretation of compliance or inconsistency of findings with research findings and theories.
- Conclusion includes a summary of the problem, provide a summary of the
  results and overall conclusion and recommendations based on the results
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  endnote (no footer) and as a two-column table (contains the endnote
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- In order to reference within the text (APA) method should be used; so the author's last name with the year of publication it is presented in the text respectively. If there are two authors, last names' will be separated by "and" and if more than three people, "et al." will be used
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# Editor's Note

I am pleased to announce that the Ferdowsi University of Mashhad is publishing Iranian Journal of Accounting, Auditing & Finance (IJAAF). On behalf of the board of the IJAAF and my co-editors, I am glad to present the Volume 1, Issue 1 of the journal in December 2017; the journal will publish four issues in a year. The board includes experts in the fields of accounting, finance and auditing, all of whom have proven track records of achievement in their respective disciplines. Covering various fields of accounting, *IJAAF* publishes research papers, review papers and practitioner oriented articles that address significant issues as well as those that focus on Asia in particular. Coverage includes but is not limited to:

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- Accounting education

Perspectives or viewpoints arising from regional, national or international focus, a private or public sector information need, or a market-perspective are greatly welcomed. Manuscripts that present viewpoints should address issues of wide interest among accounting scholars internationally and those in Asia in particular.

Yours faithfully,

Mahdi Moradi

Editor in Chief

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Research Article

# The Effect of Corporate Governance on Export Performance of Iranian Listed Companies

### Mahdi Moradi

Faculty of Economics and Business Administration, Ferdowsi University of Mashhad, Mashhad, Iran

#### Abbas Ghodratpanah, Farzaneh Salarmoradi

Economics and Administrative Sciences, Attar Institute of Higher Education, Mashhad, Iran

#### **Abstract**

This research aims to investigate the effect of corporate governance mechanisms on export performance. The statistical population includes 98 export companies listed on the Tehran Stock Exchange from 2010 to 2016. Data mining and statistical analysis are used to test the research hypotheses. This paper operationalizes the corporate governance mechanisms by the board of directors' independence, the concentration of ownership, and institutional investors. It further operationalizes export performance by export sales, export sales intensity, and the volume of export sales. The results show that ownership concentration has a significant effect on export sales. Furthermore, institutional investors have a significant effect on the volume of export sales. The current study may give great direction to companies exporting their products. In addition, the results also give researchers a path to focus on the current subject, especially in a developing country like Iran.

**Keywords:** Corporate governance, Export performance, Export sales, Export sales intensity, Export sales volumes

\*Corresponding Author: Professor of Accounting, Email: mhd\_moradi@um.ac.ir



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#### 1. Introduction

Nowadays, there is no doubt about corporate governance's importance for companies' success because one of the main factors in improving economic efficiency is corporate governance mechanisms that include relationships between shareholders, companies, and stakeholders (Berle and Means, 1932). Good corporate governance should provide proper incentives for the board and management to pursue the company and shareholders (WTO, 2004). Companies believe that good corporate governance facilitates the management and control of the business entity's effectiveness and can provide optimal returns for all stakeholders (Elsayed and Wahba, 2013). Cadbury (1992), known as the father of corporate governance, introduces corporate governance as a system in which companies are conducted and controlled.

What has become more evident in recent decades is the internationalization of trade and companies' turning into the global market (Lin and Hinson, 1998). With exports, companies can offer their products in foreign markets with the least engagement in local activities (Morgan et al., 2004). However, despite numerous export benefits, many managers are reluctant to export due to failures and obstacles. Given the importance of the issue, solutions are needed to reduce these problems. Therefore, considering the role of corporate governance mechanisms in companies' success, it is necessary to use them. Therefore, in Iran, which seeks to reduce the economy's dependence on oil, it is necessary to expand export and effective foreign markets presence in its development plans. A way should also be found to apply for an executable export program with the most efficient method. Therefore, the purpose of this study is to clarify the extent to which corporate governance mechanisms affect the export performance of companies. So, the key to solving the mystery is to find mechanisms within the company to help managers improve their exports and stimulate economic growth.

Finally, reviewing the research literature revealed that no research had been carried out on the effect of corporate governance mechanisms on export performance inside Iran so far.

# 2. Theoretical Framework and Hypotheses Development

In the context of board composition, the question that gets the most attention is whether non-executive members' presence on the board improves the company (Hermalin and Weisbach, 2003). Several theories, such as agency theory and shareholders theory, confirm that the non-executive directors' ratio has an important effect on each company's performance (Ho and Williams, 2003). Proponents of shareholder theory argue that non-executive managers have a different perspective on shareholders than executive members. From the theoretical point of view, when the board has a high proportion of non-executive members, its performance improves (Muth and Donaldson, 1998).

According to some researchers (Zahra and Pearce, 1989; Hambrick and Jackson, 2000), non-executive members of the board will lead to improved performance. The larger the number of independent board members will lead to better company performance.

However, some studies have reported the lack of relationships between non-executive members and the company's performance (Forsberg, 1989; Hermalin and Weisbach, 2003; Bhagat and Black, 1999).

Non-executive members of the board have a negative effect on the company's performance (Wang et al., 2012). Companies with independence from the Board of Directors are less likely to suffer from a financial crisis than companies with a low percentage of non-executive directors (Chang, 2009).

Efforts have been made to establish an effective monitoring mechanism on

The Effect of Corporate Governance on Export Performance of Iranian Listed Companies companies' performance in Iran, which has led to establishing a corporate governance system in the Tehran Stock Exchange. One of the things that are emphasized in this regulation is the non-assignment of board members in companies. The research tries to focus on various aspects of corporate governance and develop mechanisms to improve its performance. Non-executive directors have the independence and oversight of managers' performance, and therefore they are expected to be a strong mechanism for achieving the company's future goals. On the other hand, many managers are reluctant to export despite the export benefits due to failures. Accordingly, there is a need for solutions to reduce this problem to some extent; therefore, with these concepts, the relevant hypotheses are formulated as follows:

H<sub>1</sub>: Independence of the board has a significant impact on export growth.

H<sub>2</sub>: Independence of the board has a significant impact on export intensity.

H<sub>3</sub>: Independence of the board has a significant impact on the volume of export sales.

There are different opinions about the type of relationship and how ownership of major shareholders affects managers' performance. One of the hypotheses is the hypothesis of effective supervision. According to this hypothesis, in contrast to minority shareholders, major shareholders can monitor managers' performance at a lower cost due to the availability of facilities, expertise, and high experience. On the other hand, according to the strategic alignment hypothesis, sometimes the expectations of major stakeholders may be tied to managers' interests. Thus, the interests of minority shareholders are ignored. In this situation, the expected beneficial effects of effective oversight by major stakeholders on managers are reduced. In this case, there is a kind of conflict of interest between major shareholders and other owners. Because of the power of the influence of the major shareholders, other shareholders will suffer losses. In fact, these shareholders have both positive and negative effects because they strengthen the incentive to monitor the performance of management and, on the other hand, align the interests of major shareholders with minority shareholders.

Some researches show better performance in companies that focus on ownership (Leung and Horwitz, 2009; Gedajlovic and Shapiro, 2002; Claessens and Simeon, 1999; Xu and Wang, 1999). On the other hand, some studies result in the lack of a relationship between the focus of ownership and the company's performance (Coenen, 2015; Omran et al., 2008).

Kapopoulos and Lazaretou (2007) suggested that a more focused ownership structure has a positive and significant relationship with its profitability. Also, focusing on ownership can increase a company's value by reducing agency costs (Shleifer and Vishny, 1997).

According to Cadbury, corporate governance is a system in which corporations are controlled and directed. And determines how and by whom the company should be managed to function more appropriately in all areas. Accordingly, the hypotheses are presented as follows to be tested in the Iranian environment:

H<sub>4</sub>: Ownership concentration has a significant impact on export growth.

H<sub>5</sub>: The concentration of ownership has a significant impact on export intensity.

H<sub>6</sub>: Ownership concentration has a significant impact on the volume of export sales.

Before the emergence of very large companies, in the late eighteenth century, the owners were managers and managers were the owner; however, with the separation of ownership from management, the emergence of securities markets and groups of professional executives, a new approach called a joint corporation was introduced to a social phenomenon. This led to a conflict of interests between the manager and the owner. Therefore, this group can have a significant impact on corporate governance. Therefore, it is expected that there will be a logical relationship between the owner of this group and future performance (Velury and Jenkins, 2006).

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Per the corporate governance literature, institutional investors include banks, insurance companies, pension funds, investment companies, and other companies and government agencies that deal with the purchase and sale of securities (Koh, 2003). It is generally thought that the presence of institutional investors may lead to changes in corporate behavior. This comes from regulatory activities that these investors are doing (Bushee, 1998). Jensen (1986) states that institutional investors can help reduce agency costs, monitor the company's performance, change managers, and ultimately protect shareholders' interests when they do control. In fact, major owners are able to reduce these problems. Due to the high investment volume, they have a better incentive to oversee management and more power to impose effective decisions on minority shareholders and dispersed owners (Baltagi, 2013).

Kaplan and Minton (1994) find that large shareholders' presence is associated with more management changes, representing these shareholders' supervisory duties. Institutional investors have the opportunity and ability to discipline and influence managers. Supervising a company through such investors can make executives' pay more attention to corporate performance and less attention to their interests (Ramsay and Blair, 1993). Allan Chang Aik Leng's research (2004) refers to the direct relationship between the percentage of ownership of institutional investors in the company and its income. Tsai and Gu (2007) found that institutional investors may reduce agency problems resulting from the separation of management and ownership. Many researchers (Mcconnell and Servaes, 1990; Smith, 1996; Del Guercio and Hawkins, 1999; Davis, 2002; Clay, 2001; Chaganti and Damanpour, 1991; Maug, 1998) found that institutional investors' supervision would result in more focused management and positive impact on long-term performance. However, Loderer and Martin (1997) did not find a meaningful relationship between institutional ownership and the company's performance. Corporate governance involves processes for managing corporate efforts to create value for shareholders and as a mechanism for protecting interests (Butt and Hasan, 2009). Because institutional shareholders have a controlling role, those forces executives to act in a way that does not harm the company in the long run (Bushee, 1998). The study seeks to ensure that this group of shareholders may improve export performance because of their controlling role. Therefore, according to the stated points, the hypotheses are as follows:

H<sub>7</sub>: The institutional investor has a significant impact on export growth.

H<sub>8</sub>: Institutional Investor has a significant impact on export sales intensity.

H<sub>9</sub>: The institutional investor has a significant impact on the volume of export sales.

# 3. Methodology and Research Design

In terms of data collection method, this research is correlation research, and its main purpose is to determine the existence, extent, and type of relationship between variables. In this research, data collection will be done in a library and archival way. The data used are classified into two parts: The first part is data related to the theoretical framework and research literature, which is compiled from books, valid articles, scientific journals, student theses, and valid sites. The second part of this study uses data collected from the post-event approach. In fact, the data is based on the actual figures and actual information about the stock market and corporate financial statements. These data are collected through the company's basic financial statements from 2010 to 2016, published on the Tehran Stock Exchange websites at www.codal.ir and www.rdis.ir and also is available in Rahavard Novin software.

The statistical population of this research includes all export companies listed on the Tehran Stock Exchange, which has the following conditions:

1- Companies have been listed on the Stock Exchange by the end of March 2010;

- 2- During the years 2010 to 2016, there will be no change in the fiscal year and operations cessation.
- 3. The financial statements and accompanying notes of the companies are available on the stock exchange,
  - 4. Companies have the export.
- 5. The companies do not type of investment and insurance companies, banks, and financial and credit institutions and holding companies.

According to the collected data, a final sample was obtained, according to the table below.

Table 1. Number of statistical pop	ulation and conditions
	Deleted companies in

Description	Deleted companies in total courses	Total Companies
All listed companies in Tehran Stock Exchange during 2010-2016		520
Due to change the fiscal year or stop the operation	(82)	
Due to lack of access to information	(48)	
Due to the type of company (Financial intermediation, insurance, and investment and financing)	(108)	
Companies that have entered the Tehran Stock Exchange during the research period	(99)	
No export sales	(85)	
Available statistical population		98

# 3.1. Data analysis and testing hypotheses

In this research, the effect of corporate governance mechanisms on export performance was investigated. To test the hypotheses, the following models will be used based on the theoretical framework:

(1) export growth<sub>it</sub>=  $\beta_0 + \beta_1$  perc indept dir<sub>it</sub> +  $\beta_2$  o.con<sub>it</sub> +  $\beta_3$  in stitown<sub>it</sub> +  $\beta_4$  b.size<sub>it</sub> +  $\beta_5 R \& D_{it} + \beta_6 \log w_{it} + \beta_7 A g e_{it} + \beta_8 siz e_{it} + \beta_9 leverag e_{it} + \beta_{10} M T B_{it}$ +  $\beta_{11} ROI_{it} + \beta_{12} year_{it} + \beta_{13} industry_{it} + \varepsilon_{it}$ 

(2) export intensity<sub>it</sub>= $\beta_0 + \beta_1$  perc indept dir<sub>it</sub> +  $\beta_2$  o.con<sub>it</sub> +  $\beta_3$  in stitown<sub>it</sub> +  $\beta_4$  b.size<sub>it</sub> +  $\beta_5 R\&D_{it} + \beta_6 log w_{it} + \beta_7 Age_{it} + \beta_8 size_{it} + \beta_9 leverage_{it} + \beta_{10}$  $MTB_{it} + \beta_{11} ROI_{it} + \beta_{12} year_{it} + \beta_{13} industry_{it} + \varepsilon_{it}$ 

(3) volume of export sales<sub>it</sub>=  $\beta_0 + \beta_1$  perc indept dir<sub>it</sub> +  $\beta_2$  o.con<sub>it</sub> +  $\beta_3$  in stitown<sub>it</sub> +  $\beta_4$  $b.size_{it} + \beta_5 R\&D_{it} + \beta_6 log w_{it} + \beta_7 Age_{it} + \beta_8 size_{it} + \beta_9 leverage_{it} +$  $\beta_{10} MTB_{it} + \beta_{11} ROI_{it} + \beta_{12} year_{it} + \beta_{13} industry_{it} + \varepsilon_{it}$ 

In order to test the research models, the Chow test was first used to examine the use of the ordinary least square (OLS) or panel method. In the first model, the ordinary least square (OLS) method was confirmed. Durbin-Watson, Breusch-Pagan, frequency distribution, box, and quartile-quartile plots were used to test the underlying ANOVA assumptions. Because of the absence of one of the assumptions, the generalized least squares estimator was used. But in the second and third models, the data was a panel. After the Hausman test, the panel with random effects in the second model, and in the third model, the panel method with fixed effects were used to estimate the model's coefficients. The ability to integrate temporal and spatial effects in the second model demonstrates the model's ability to integrate effects. Consequently, it was necessary to examine the underlying ANOVA assumptions. The Breusch-Godfrey test indicated a serial correlation between model errors so that the generalized integration panel model

was used to estimate the coefficients of the model. In the third model, Godfrey's test showed a serial correlation between model errors and coefficients' estimation; a generalized fixed effects panel model was used.

Each of the variables used in these models is calculated as follows:

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Table 2. Variables calculation

Variable name	Explanation
export growth	The difference between sales for the current year and the previous year divided by sales related to the previous year
export intensity	Export sales divided by total sales
the volume of export sales	Export sale divided by total assets to be homogeneous.
perc indept dir	The percentage of independent board members is calculated by dividing the number of non-executive members by the total number of board members.
o.con	The concentration of ownership is the accumulation of the second-power percentage of the ownership of institutional shareholders
in stitown	An institutional investor is calculated through the aggregate shareholding of institutional investors divided by the company's total shares.
b.size	Board size is equal to the number of its members.
R	The virtual variable of research and development holds 1 in institutions with research and development units and zero in other institutions.
log w	The labor cost logarithm is the same as the ratio of wages paid to the number of employees.
Age	The company's age is equal to the natural logarithm of the company's life since its inception.
size	In this research, annual sales' natural logarithm is considered an indicator of the company's size.
leverage	The financial leverage is calculated by dividing the total debt into total assets.
MTB	Expectations of future profitability growth are equal to the ratio of the market value of equity to its book value.
Roi	Return on investment is calculated by the net profits ratio (losses) to the assets' book value.

# 4. Research findings

# 4.1. Descriptive statistics of research variables

Descriptive statistics have been reviewed to summarize the collected data and recognize more population research. By comparing the standard deviations of variables, it is concluded that the institutional investor variable has the most dispersion and the least stability, and the variable of return on investment with the least standard deviation has the highest stability and sustainability during the research period. It should also be noted that 75% of companies have decentralized ownership, 18% have non-executive companies, and 12% do not have institutional investors. In this table, the first independent variable is the board of directors, with an average of 76% in the range of 0 to 1. The next independent variable is the concentration of ownership, with an average of 26% in the range of 0 to 9% ownership. The third independent variable is an institutional investor with an average of 44% and a range of 0 to 99%. Table 2 shows the descriptive statistics of the independent, dependent, and control variables of the research.

The Effect of Corporate Governance on Export Performance of Iranian Listed Companies **Table 3.** Descriptive statistics

Variable name	Mean	Median	Standard deviation	Minimum	Maximum
export.growth	2.252	0.159	19.067	-0.998	400.721
export.intensity	0.212	0.102	0.262	0.00003	1.165
Volume export sales	0.173	0.079	0.238	0.00003	2.061
perc.indept.dir	0.762	0.800	0.206	0	1.000
o.con	0.268	0.130	0.303	0	0.979
in.stitown	44.309	39.945	34.277	0	98.98
b.size	5.032	5.000	0.251	5.000	7.000
ln log.w	5.021	4.984	0.882	1.495	15.078
ln Age	3.500	4.000	0.523	2.000	4.000
Size	13.882	13.703	1.381	10.958	18.936
Leverage	0.597	0.614	0.194	0.057	1.896
MTB	2.439	2.087	4.233	-27.387	87.069
RoI	0.147	0.131	0.140	-0.789	0.626

Below is a table of frequency of qualitative variable (R):

**Table 4.** Frequency of qualitative variables

Year	Total	Type of data	0	1
2009	98	Frequency	88	10
2009	90	Percentage	0.89	0.1
2010	98	Frequency	88	10
2010	90	Percentage	0.89	0.1
2011	98	Frequency	88	10
2011	90	Percentage	0.89	0.1
2012	98	Frequency	89	9
2012	2012 98	Percentage	0.9	0.09
2013	98	Frequency	86	12
2013	90	Percentage	0.87	0.12
2014	98	Frequency	86	12
2014 98	Percentage	0.87	0.12	
2015	98	Frequency	88	10
2013	98	Percentage	0.89	0.1

The scale of measuring some of the variables includes the nominal and ordinal scale used for qualitative variables. These variables are two-dimensional or multi-dimensional, and using mean, standard deviation, skewness, and elongation indices is not appropriate for their description. Therefore, to describe these variables, mod and frequency percentages should be used. In this research, the variable of research and development expenditures is considered as a two-dimensional variable. The percentage for a two-dimensional variable expresses how many percent of a variable's data has a code of 1 and how many percent has a code of 0.

# 5. Test Results of Research Models

# 5.1. The first model of research

In the first model, the impact of the board of directors' independence, the focus of ownership, and institutional investors on export growth are examined. It is necessary to state how these criteria will affect the export growth of the company. In this model, the F-Limer test was used to detect the method of panel data or OLS.

**Table 5.** Diagnostic tests performed to select the best regression model

Test	F	Df 1	Df 2	P-value
Chow	0.963	91	574	0.579

As it is seen, the p-value of this test is more than the significance level of 0.05, which means that the panel data cannot be used, and the ordinary least squares method must be used for fitting the model to the data. After reviewing ANOVA Assumptions, if at least one of these assumptions is not available, then the generalized regression model should be used. Then the Durbin-Watson test was used to determine the first-order autocorrelation.

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Table 6. Durbin-Watson test

$(H_0)$	DW	Test statistic	Test results
first-order autocorrelation	1.956	0.262	$H_0$ is not rejected
inst order autocorrelation	1.750		first-order autocorrelation

According to the Durbin-Watson test result shown in Table 6, since the calculated p-value is greater than the error level of 5%, there is no error between the first-order autocorrelation model. The Breusch-Pagan test is then followed up to verify that the variance of the errors is constant.

Table 7. Breusch-Pagan test

$(H_0)$	Test statistic	Df	P-value	Test results
homogeneity of variance	21.164	18	0.271	$H_0$ is not rejected (Heteroscedastic)

According to the Breusch-Pagan test, because the calculated p-value is larger than the error rate of 5%, the H0 hypothesis is not rejected, so the model error variance is constant. The frequency distribution, box, and quartile-quartile plots were also used to check the errors' normality. The results show that the errors do not follow the normal distribution. Therefore, the regression model should be fitted, and the generalized least squares method should be used to estimate the parameters. Also, the chi-square test was used to examine the significance of the model so that the p-value of this statistic in the model is less than 0.05, and we can confirm the significance of Model No. 1 with 95% confidence.

**Table 8.** Significance test of the regression model

Model Test statistic		Df	P-value
1	6886	18	< 0.001

Thus, in Model No. 1, among the relevant hypotheses, only the fourth hypothesis of the impact of ownership concentration on export growth was approved, and none of the first and seventh hypotheses were approved.

# 5.2. The second model of research

The second model examines the second, fifth, and eighth hypotheses, which respectively relate to the impact of the board's independence, the concentration of ownership, and institutional investor on the export sales intensity. In this model, the p-value of the f-Limer test is less than 5%, so the panel data method was approved.

The Hausman test is used to test the suitability of a model with fixed or random effects.

The Effect of Corporate Governance on Export Performance of Iranian Listed Companies According to the Hausman test results, and the p-value is greater than the error level of 0.05, the H0 hypothesis is not rejected at the 0.05 error level. Consequently, it is necessary to estimate the panel model with random effects. The results of the test of the integration of temporal and spatial effects are shown in table 11.

**Table 9.** The results of estimating coefficients of the regression model (1) using the GLS method

	111011101			
	Estimate	Std. Error	t-statistic	P-value
(Intercept)	-13.034	18.841	-0.692	0.489
perc.indept.dir	3.643	3.744	0.973	0.331
o.con	14.841	6.594	2.251	0.025
in.stitown	-0.078	0.058	-1.337	0.182
b.size	1.180	2.999	0.393	0.694
factorI1	-1.242	2.940	-0.422	0.673
log.w	-0.383	0.906	-0.423	0.672
Age	0.356	1.462	0.243	0.808
size	0.357	0.676	0.528	0.598
leverage	4.103	5.823	0.705	0.481
MTB	-0.052	0.176	-0.296	0.767
RoI	4.307	8.387	0.514	0.608
Year Fixed Effect	Yes			
Industry Fixed Effect	Yes			

**Table 10.** The results of the F-Limer test

Test	Fisher statistic	Df 1	2Df	p-value
F-Limer	10.728	91	575	< 0.001

**Table 11.** The results of the Hausman test

Test	Test statistic	Df	P-value
Hausman	11.726	12	0.468

**Table 12.** The results of the test of the integration of Simple effects

Zero hypotheses $(H_0)$	Fisher statistic	p-value
There is the ability to integrate temporal effects.	0.794	0.427
There is the ability to merge spatial effects.	24.712	< 0.001
There is the ability to integrate temporal and spatial effects.	24.712	< 0.001

Since the p-value of the temporal effects test (0.427) is greater than the error rate of 5%, there is the possibility of integrating the model's effects; therefore, the generalized integration panel model should be applied for fitting the regression model. In the panel model, the lack of serial correlation between model errors is one of the underlying assumptions; therefore, the Breusch-Godfrey test was used.

Table 13. Breusch-Godfrey / Wooldridge Test

Zero hypotheses $(H_0)$	Test statistic	Df	P-value
The lack of serial correlation between errors	234.042	6	< 0.001

The chi-square test's significance was also confirmed and concerning the p-value of less than 5%.

**Table 14.** Test of the significance of the regression model

Model	Test statistic	Df	P-value
second model	-371.472	21	< 0.001

In the second research model, none of the hypotheses were approved.

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**Table 15.** Results of estimating coefficients of the regression model (2) using the generalized panel method

	Estimate	Std. Error	t-statistic	P-value
(Intercept)	-0.495	0.298	-1.661	0.097
perc.indept.dir	-0.061	0.037	-1.627	0.104
o.con	-0.021	0.097	-0.22	0.826
in.stitown	-0.0001	0.0001	-0.228	0.82
b.size	0.051	0.045	1.129	0.259
factorI1	-0.005	0.042	-0.108	0.914
log.w	0.014	0.009	1.617	0.106
Age	0.065	0.031	2.082	0.037
Size	0.007	0.012	0.583	0.56
Leverage	-0.062	0.07	-0.89	0.373
MTB	-0.003	0.002	-2.001	0.045
RoI	0.062	0.091	0.686	0.492
Year Fixed Effect	Yes			
Industry Fixed Effect	Yes			

#### 5.3. The third model of research

In the third model, it was still necessary to consider whether the board of directors' independence, ownership concentration, and institutional investors could significantly affect export sales volume. The F-Limer test was used to select a panel or OLS data method. Given that the p-value of this test is less than 5%, the use of the panel data method was approved.

Table 16. The results of the F-Limer test

Test	Fisher statistic	Df 1	2Df	p-value
F-Limer	8.478	91	575	< 0.001

The Hausman test was used to select the appropriate model between the panel model with fixed and random effects.

**Table 17.** The results of the Hausman test

Test	Test statistic	Df	P-value	
Hausman	27.958	12	0.006	

The Hausman test results show that the p-value is less than the error level of 0.05, so the H0 hypothesis is not accepted at the 5% error level and is necessary to estimate the panel model with constant effects. One of the panel model's underlying assumptions is that there should be no serial correlation model errors. The Breusch-Godfrey test has been used to examine the serial correlation, and the results are shown in Table 18.

Table 18. Breusch-Godfrey Test

Zero hypotheses $(H_0)$	Test statistic	Df	P-value
The lack of serial correlation between errors	108.524	6	0.001>

In this test, a p-value of less than 5% error level indicates serial correlation. Therefore, the generalized fixed effects panel model should be used to estimate the coefficients of the model. It is necessary to examine the whole model's significance before examining the variables and checking the hypotheses' confirmation or disapproval. This is done by calculating the chi-square and p-value statistics of this statistic.

**Table 19.** Test of the significance of the regression model

Model	Tost statistic	Df	P-value
Mouci	1 est statistic	DI	1 - value
third model	-410.830	21	< 0.001

The Effect of Corporate Governance on Export Performance of Iranian Listed Companies Considering the p-value calculated for this statistic, we can confirm the significance of model number 3 with 95% confidence. Only the ninth hypothesis was confirmed in the third research model, and none of the third and sixth hypotheses were approved.

**Table 20.** Results of estimating coefficients of the regression model (3) using the generalized panel method

	Estimate	Std. Error	t-statistic	P-value
(Intercept)	-0.506	0.286	-1.769	0.077
perc.indept.dir	-0.055	0.037	-1.504	0.133
o.con	0.088	0.093	0.947	0.344
in.stitown	-0.001	0.001	-1.789	0.074
b.size	-0.012	0.043	-0.289	0.772
factorI1	-0.015	0.040	-0.374	0.709
log.w	0.012	0.009	1.345	0.179
Age	0.056	0.029	1.970	0.049
Size	0.020	0.012	1.658	0.097
Leverage	0.130	0.068	1.931	0.053
MTB	-0.002	0.002	-1.294	0.196
RoI	0.430	0.089	4.847	< 0.001
Year Fixed Effect	Yes	•	•	•
Industry Fixed Effect	Yes	_		

# 6. Discussion and Conclusion

Considering that in theoretical foundations, the emphasis is placed on the impact of corporate governance mechanisms on company performance, in this research, it was expected that these mechanisms could improve company performance and export performance, so that the export level of Iran; But only in two hypotheses, the effectiveness of these mechanisms was accepted.

In the fourth hypothesis, the impact of ownership concentration on export growth was confirmed. According to the effective monitoring hypothesis, major shareholders' existence, in comparison with minority shareholders, impacts managers' performance due to their expertise and experience. The company's sales are improving in global markets when the company's concentration of ownership increases, managers in such powerful owners prefer to avoid the company's abuse to their satisfaction.

In the ninth hypothesis, the institutional investor's influence on the volume of export sales was accepted. Given that there is a conflict of interest in the firm between the manager and the owner, this group of investors can control the firm's management due to adequate control over the assets and reduce the agency's cost. Therefore, their presence will lead to a change in managers' behavior and, consequently, affect the company's performance and particularly affect export performance. Therefore, based on this study's findings, only two corporate governance mechanisms can affect two aspects of the company's export performance.

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Research Article

# The Role of Management Ability, Political Influence and Financial Pressure in the Assets and Liability Management of Iranian Banks

#### Habib Piri\*

Faculty of Economics and Administrative Sciences, Zahedan Branch, Islamic Azad University, Zahedan, Iran

#### Abstract

This study aims to assess how management ability, political influence, and financial pressure affect Iranian banks' assets and liability management. To do this, the information of 11 active banks on the Tehran Stock Exchange is analyzed during 2009-2017. Three indices of liability to capital ratio, deposit to total assets ratio, and loans to total assets ratio are used for assessing the assets and liability management of banks. The results show that, first, management ability contributes to the liability to assets ratio. However, there is no significant relationship between management ability and deposit to assets ratio and loan to assets ratio. Second, political influence is inversely associated with the liability to capital ratio. This paper is the first study to assess such a topic in an emerging market. Thus, the results can provide useful insights for the financial analysts, shareholders, investors, government, and directors of banks in neighborhood countries.

**Keywords:** Management ability, Political influence, Financial pressure, Assets and liability management, Liability to capital ratio, Deposit to total assets ratio, Loans to total assets ratio.

\*Corresponding Author: Assistant Professor of Accounting, Email: hhpiri1354@gmail.com



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# 1. Introduction

The development of international dependencies from many sociopolitical aspects, especially in the economy of globalization, has caused the required motivations for integrating banking and financial systems to be of great importance. Following that, the significance of the global topics of accounting and bank management and understanding them is necessary. In this regard, frequent control and assessment of key items of balance sheet and the evaluation of significant issues in the balance sheet, including liquidity, the ability to pay back the debts, financial flexibility, as well as density, diversity, scheduling, and quality of assets and debts are of great significance. Banks are connected with different kinds of monetary and financial markets through different investors and borrowers. They are frequently entangled with a variety of risks, such that they may decide to enter a market or withdraw from that, increase or decrease one or several kinds of risks. Up to 1970, most of the bank activities include credit payments. In other words, that was mediation between small and low-cost deposits and providing loans. Pricings and investments were based on simple decisions, and the most important management challenge has been quality control of assets, loan losses, and additional costs. The emergence of inflation and economic recession problems and instability of interest rates at the end of the 1970s and early 1980s have caused banks' management of assets and debts to gain importance for keeping receivable profit margin (Greuning and Bratanovic, 2000). Assets and liability management includes technical tools and methods that guarantee value creation for shareholders and risk control. Today, the increasing growth of change in banking trends from extending balance sheet items to concentration on capital return rates and risk control has caused the assets and liability management knowledge for managers of banks to become an urgency for responding earnings outcomes.

Currently, accounting is in search of methods, policies, perspectives, and standards to realize, measure, classify, compare, purify, and control the actual and potential financial events, values, activities, and transactions to be able to provide useful and effective financial reports for users and managers' responding. The Bank monitoring committee in Bank for International Settlement, referred to as Wing Committee, believes that liquidity is of great importance in banks and lacks that brings about extensive consequences. Thus, the committee carried out large-scale studies to reach a series of basic liquidity management policies and principles. After releasing a report in September 1992 entitled, "a framework for measurement and liquidity management", by making the required modifications and changes and by considering the general and basic principles in liquidity management of banks in February 2000, a journal published under the name of "effective methods of liquidity management of banks" from the committee's side, which is comprised of 14 key principles about managing bank liquidity in 94 paragraphs. On the other hand, the performance of firms during financial crises is not merely describable using economic growth and stability in gaining profit, and some other effective factors are involved in the process. During economic flourishment, considerable problems of firms resulted in the formation of different strategies, diverse investment opportunities, and even different managerial policies and the effect of financial crises, recession periods, and economic flourishment on firm performance is traceable in the form of the following factors: First, during financial crises when the chance of occurrence of an unexpected decline in stock market price is high, the risk of occurrence of lawsuits is higher, so economic growth decline would lead to lawsuits. One of the ways to lower lawsuits is conservative reporting and presenting the best performance, such that managers are not prosecuted due to opportunistic behaviors and use of earnings management (Watts, 1993). Second, the demand for stabilizing the performance is higher during financial crises due to existing

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investment uncertainties. Since the probability of gaining negative outputs is higher during the recession, the investors ask for performance stability and no such excessive declines during recession periods. The inclination of investors and ownership during flourishment; however, under the influence of investment uncertainties is inverse. They ask for performances with ascending incline to gain maximum value from the provided opportunity. Third, banks always demand internal financial supply, not external ones, and in times of external financial supply, they attempt to absorb more investors' resources (Myers, 1984). During financial crises, concerning the decline of bank profitability, the deposit rates will also go down, and deposit resources will be withdrawn from banks. On the other hand, a recession occurs along with inflation in undeveloped countries, and the inflationary recession is another obstacle for banks' directing resources. Hence, financial crises result in the outflow of depositors' deposits both via declining the ability to pay interest and creating inflationary recession and cause the supply of bank resources to be faced with serious problems. Given the related theoretical literature to the effectiveness of different factors in performance aspects of banks, we should declare that special situation of the banking industry in Iran and the effects of different factors, like dependency on the government, existing political risks, macroeconomic status, as well as the relations of the Iranian economic system with the external world (especially due to economic sanctions) have caused different dimensions of bank performance to be influenced by these indices, to the point that in addition to profitability condition and ability to gain income, the assets and liability management of banks, to a great extent, is affected by the abovesaid conditions. Hence, by analyzing significant navigation aspects of bank management, we can assess these aspects' impact on different performance characteristics to elucidate the fluctuations of banking conditions finally. Therefore, the present study's major problem is formulated as follows: Do management ability, political influence, and financial pressure contribute to assets and liability management of banks?

On the other hand, by investigating the topic literature, we observe that no study carried out so far to assess the determining factors to assets and liability management of banks in the banking industry of the emerging markets and the impact of management ability, political relations, and financial crises on this topic is not studied. So, this paper has innovation from three aspects. First, it is about the impact of management ability on assets and liability management of banks. Second, it analyzes the impact of political influence on assets and liability management of banks; and third, it considers the effect of financial pressure on improving assets and liability management of listed banks on the Tehran Stock Exchange, so the contribution of this paper for knowledge increase and innovation can be listed as follows:

- 1) This paper presents a model for describing the reason for changes in assets and liability management of active banks in the Tehran Stock Exchange, which is not studied in the country so far;
- 2) Innovation in the used indices: the proxy for measuring management ability is the use of a data envelopment method based on inputs and outputs related to management performance in the banking industry.
- 3) Using an innovative synthetic method, we mean data envelopment method, panel data method, and bank data use until the end of 2017.

Hence, given the significance and necessity of exact evaluation of capital cost for banks and also the importance and urgency of performance improvement in this basic firm in the economy, the realization of contributing factors to assets and liability management is of great importance for managers, investors, and creditors, as well as the government. Finally, the present study aims to assess the impact of management ability, political risk, and financial crises on banks' assets and liability management. In the

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following, we initially express the theoretical principles related to variables, assess the relationship between the dependent and independent variables, and finally discuss the methodology, data analysis, discussion, and conclusion in the upcoming sections.

# 2. Background and Hypothesis Development

Banks, like other economic firms, seek to maximize the profitability and interests of their beneficiaries. In other words, given the increasing pressure in the competitive market and limitation of resources, banks attempt to maximize their incomes and minimize the costs to the extent possible. The source of bank income is mainly facilities and investments categorized under the balance sheet title. The source of costs is mainly bank deposit resources that are categorized under the title of liabilities. However, the goal of maximizing the profit is always under the influence of different risks the banks are dealing with. These risks affect banks' profitability by affecting the cost and bank income and even jeopardize banks' existence. The major activities of financial intermediaries, including banks, is to absorb deposits and credit facilities. In other words, financial intermediaries, like banks, have dual activities in the monetary market. On the one hand, they demand investors' monetary resources and, on the other hand, supply monetary resources to investors and gain profit via this system. Banks seek a strategy to make maximum profit with minimum risk possible. In the first step to implementing the model, by considering two threshold modes of maximizing profit and minimizing risk, the optimum strategy should be determined for an optimum combination of resources-facilities. The strategy has given weight to the amount of significance of resource and facilities components based on their impact on maximum profitability and minimizing bank risk (Vaidyanathan, 1999).

By casting an integrated and synchronized look to bank assets and liabilities, their combination and contributing factors, including risk, integrated assets, and liability management, is a systematized managerial approach that puts into effect the predetermined goals profitability or risk decrease. In other words, assets and liability management comprises a set of specialized tools and methods that take the value creation for shareholders and risk control into consideration (Biety, 2012).

The international economic system indicates a close relationship between the investment system and the level of advancement of countries (Guttman, 1994). This means that countries with an efficient pattern for allocating capital to different economic sections benefit from higher social welfare. This is obvious that directing national capitals as well as the savings of people toward economic activities is pursued via the banking system of that country. Commercial banks in each country collect resources and national capitals and allocate that to different economic sections pave the way for economic growth and development. Hence, banks' success in doing these procedures is of great importance (Brayan, 1993). Although collecting resources is important, efficient specialization of available resources to this goal is even much important. Regardless of the geographical region, banks can efficiently allocate their resources to customers only when they benefit from a valuable customer evaluation system. Hence, different countries use particular strategies to achieve their goals in this field. In Iran, regarding the Islamic banking system and load allocation in the form of Islamic contracts to true and legal customers, credit customer evaluation is of great importance. The system is important when it has appropriate criteria for evaluating customers before giving facilities, such that, by using this system, bank facilities are granted to favorable customers (Morsman, 1997). The importance of evaluating political influence on different aspects of bank performance can be sought in the following factors: first, a considerable proportion of active bank management in the capital market, either directly or indirectly, is under the influence of political management because the government

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and its agencies that impose their power through institutes and satellite firms to the government, have penetrated in most of the banks and are able to affect their internal operational processes as well as their working and accounting policies to be able to direct the performance and policies of banks. The issue is more observable in banks that a proportion of their stocks is transferred per article no. 44 of the constitution, the transfer of state-owned companies because these firms' management is actually under the government's influence. The bank policies are tried to remain in the government's possession. Second, political events contribute to the political relations, such that the managers of large banks (Saderat and Tejarat) under the influence of political events, despite not being managed by the government, embark on a type of political management and change their objectives, strategies, and performances in line with the political situations and this would lead to a change in current and operational policies of the firm and can finally contribute to the conflict of interest between managers and owners and even the conflict of interests between the government and owners and/or the conflict of interest between society and owners, so the presence of political relations can affect strategies, objectives, and management method of the active bank on the Tehran Stock Exchange. Financial crises are also a part of the existing reality in all countries' economies, critical for a country like Iran, under different factors regarding its political challenges. The imposed sanctions from America and the European Union's side, which mainly targeted the Iranian banks, were among the key reasons for creating financial and economic crises within the past decade. These sanctions and the subsequent crises affect directly in the first stage the performance of banks and profitability. Given that and according to the significance of created financial crises resulting from frequent foreign sanctions on the economy, especially on the banking industry, this effect should be evaluated within a study to incorporate the effects of such financial crises in planning. So far, the conducted studies in this field are as follows: Lina and Petraitytė (2014) declare that the manner of assets and liability management of Latvian Banks is under the commercial cycle's influence. They also indicate that banks demand to take more risks and, at the same time, embark on assets and liability management. On the other hand, the commercial cycle of a bank is different from the economic cycle. It is based on banks' commercial cycle that level of assets and liability will be specified in Latvian banks and finally contribute to their profitability. Chen (2009) argues that banks can increase their efficiency by decreasing 20-30% of their costs. Moreover, private international banks, compared with local private banks and state-owned commercial banks, are more efficient. Among the factors that affect banks' level of efficiency, we can refer to the persistence and stability of macroeconomy, degree of market competition, political stability, and financial development depth. Regarding what is said, research hypotheses are as follows:

*H1*: The effect of management ability on assets and liability management of banks is significant.

*H2*: The effect of political influence on assets and liability management of banks is significant.

H3: The effect of financial pressure on assets and liability management of banks is significant.

# 3. Research Methodology

The statistical population of the study includes all active firms on the Tehran Stock Exchange. This study's sampling method is purposeful sampling, where the scholar applies his judgment to the sample based on previous information from society and/or regarding certain objectives. In this method, sampling is not based on easiness, but the scholar's judgment is based on his previous information and the objective he follows

based on the project's passive aspects. Hence, in this paper, the sample under study given the scholar's objectives are listed banks on the Tehran Stock Exchange active in the banking industry and are transacted within the study period. These banks are listed in the following table:

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Table 1. Statistical sample

No.	Bank name	No.	Bank name	No.	Bank name	No.	Bank name
1	Eghtesad Novin	4	Tejarat	7	Saderat Iran	10	Kar Afarin
2	Parsian	5	Sarmayeh	8	Ghavamin	11	Post
3	Pasargad	6	Sina	9	Mellat		

The primary and raw information and data for hypothesis testing were collected using the information bank of Tehran Stock Exchange, including Tadbir Pardaz and Rah Avard-e Novin and also the published reports of Tehran Stock Exchange via direct access (by analyzing the released reports in Codal Website and manually collected data) to CDs and also by referring to rdis.ir website and other necessary resources. The data analysis method is cross-sectional and year-by-year (panel data). In this paper, the multivariate linear regression model is used for hypothesis testing. Descriptive and inferential statistical methods are used for analyzing the obtained data. Hence, the frequency distribution table is used for describing data, and at the inferential level, the F-Limer, Hausman test, test of normality, and multivariate linear regression model are used for hypothesis testing.

# 3.1. Models used for hypothesis testing

The main regression model for evaluating the hypotheses are as follows: Model (1):

$$\begin{split} \text{LEV}_{it} &= \beta + \beta_1 \text{MA}_{it} + \beta_2 \text{POLITIC1}_{it} + \beta_3 \text{POLITIC2}_{it} + \beta_4 \text{CRISIS1}_{it} \\ &+ \beta_5 \text{CRISIS2}_{it} + \beta_6 \text{CAP}_{it} + \beta_7 \text{LEVARAGE}_{it} + \beta_8 \text{PPE}_{it} \\ &+ \beta_9 \text{AGE}_{it} + \beta_{10} \text{SIZE}_{it} + \varepsilon \end{split}$$

Model (2):

$$\begin{aligned} \text{Deposits}_{it} &= \beta + \beta_1 \text{MA}_{it} + \beta_2 \text{POLITIC1}_{it} + \beta_3 \text{POLITIC2}_{it} \\ &+ \beta_4 \text{CRISIS1}_{it} + \beta_5 \text{CRISIS2}_{it} + \beta_6 \text{CAP}_{it} \\ &+ \beta_7 \text{LEVARAGE}_{it} + \beta_8 \text{PPE}_{it} + \beta_9 \text{AGE}_{it} + \beta_{10} \text{SIZE}_{it} + \varepsilon \end{aligned}$$

Model (3):

$$\begin{aligned} \text{loans}_{it} &= \beta + \beta_1 \text{MA}_{it} + \beta_2 \text{POLITIC1}_{it} + \beta_3 \text{POLITIC2}_{it} + \beta_4 \text{CRISIS1}_{it} \\ &+ \beta_5 \text{CRISIS2}_{it} + + \beta_6 \text{CAP}_{it} + \beta_7 \text{LEVARAGE}_{it} + \beta_8 \text{PPE}_{it} \\ &+ \beta_9 \text{AGE}_{it} + \beta_{10} \text{SIZE}_{it} + \varepsilon \end{aligned}$$

Where

Lev: assets and liability management – capital to liability ratio, Deposits: assets and liability management – deposit to total assets, Loans: assets and liability management – loans to total assets, MA: management ability, POLITIC1: political relations – political management, POLITIC2: political relations- governmental influence, CRISIS1: financial crisis – economic recession and flourishment, CRISIS2: financial crisis – financial pressure, CAP: capital sufficiency, LEVERAGE: financial leverage, PPE: fixed assets, AGE: bank age, and SIZE: bank size

# 3.2. Defining the variables of the study

Management ability (MA): In this paper, according to García-Meca and García-Sánchez (2018), a two-step process is used for evaluating management ability and bank efficiency based on the data envelopment method. Initially, the bank efficiency score is determined via data envelopment analysis based on input and outputs. Data

The Role of Management Ability, Political Influence and Financial Pressure in the Assets and Liability Management of Iranian Banks envelopment is a linear planning method based on each bank's banks' and performance levels' effective line methodology. It assigns an amount of efficiency in a score, between 0 and 1, to each bank. Each bank's efficiency is computed based on each bank's input and output and the effective line of all banks. Hence, we initially assess the bank's efficiency using the data envelopment method. The calculated efficiency enters the main management ability evaluation model as a dependent variable, and the management ability will be estimated. The pattern used for determining efficiency via data envelopment is as follows:

**Table 2.** Research variables for analyzing management ability

Input variables	Output variables
Total tangible assets	Total bank deposit
Net profit	Total granted bank facilities
General and office costs	Total investments
Financial costs	Total incomes
Rental costs	

Hence, in the above input and output pattern, the proportion of outputs to inputs is indicative of a pattern headed to decision improvement units as follows:

$$MAX\theta = \frac{u1Deposit + u2Loans + u3Investment + u4IntInco}{v1PPE + v2Int + v3Labor + v4IntExp + v5RentaiExp}$$

Where

Deposits: is total bank deposits at the end of the fiscal year

Loans: total granted facilities Investment: investment Intinco: total firm incomes

PPE: fixed assets

Int: net profit of the bank Labor: general and office costs Intexp: total financial costs Rentalexp: related rental costs

Where

The index of management efficiency based on the above inputs and outputs is a number between 0 and 1, which indicates complete management efficiency, and 0 indicates management inefficiency.

After performing the first stage and estimating the score of data envelopment for each bank, the following regression model will be fitted for all bank-year:

$$\begin{aligned} DEAScore_{it} &= \beta_0 + \beta_1 size_{it} + \beta_2 Market - Share_{it} + \beta_3 Cash - Flow_{it} + \beta_4 age_{it} \\ &+ \beta_5 BR_{it} + \gamma Country + Year + \varepsilon \end{aligned}$$

Where

DEAScore: is the score of bank i efficiency in the year t

SIZE: The size of bank i in the year t

Market-Share: is the market share of bank i in the year t from total deposits of the banking industry

Cash-Flow: is cash flow derived from operational activities of bank i in the year t Age: age of bank i in the year t

BR: board independence of bank i in the year t

ε: residual items of the model, which are management ability evaluation index in this paper

# Financial crisis; economic recession and boom periods (crisis1):

Financial crisis periods (crisis1) fluctuate in economic activity and usually national

production and per capita national production, which is finally shown by the economic growth rate. Each commercial period includes enhancement, boom, depression, and recession periods. In this paper, the business cycle, a virtual variable with two modes, includes economic recession and boom period 0 in economic boom mode and 1 in economic recession mode. First, the mean economic growth rate of the study period, that is, 2009-2017, is computed and depicted in the following table:

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**Table 3.** Economic growth rate – Central Bank of Iran

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	Mean
Rate	3.16	6.36	3.2	-5.4	-1.9	0.3	0.9	7.2	4.6	2.05

Estimated by Majlis Research Center given the growth rate of the first 9 months of 2017

Then, given the calculated mean of years with an economic growth rate of higher than mean, the period is not critical economically, and years with an economic growth rate of less than mean are critical economically, so years 2009, 2010, 2011, 2016, and 2017 with an economic growth rate of higher than mean (2.05) are economically noncritical period and years 2012, 2013, 2014, and 2015 with a growth rate of lower than mean (2.05) are the economically critical period, so to test the proposed hypotheses, the variable of economic crisis is a virtual variable between 0 and 1. Such that for years with economic crisis 1 and years with no economic crisis, 0 are assigned. The operational definition of other variables of the study are as follows:

**Table 4.** The operational definition of variables

Variable name	Type of variable	Sing	Definition			
Managemen t ability	Independent	MA	Calculated based on the defined pattern using the data envelopment method			
Political relations- political management	Independent	POLITICI	Virtual variable: such that if there is a government representative among the board members 1, otherwise, 0 will be assigned			
Political relations- government influence	Independent	POLITIC2	The percentage of shares available to the government directly or indirectly			
Financial crisis – economic recession and the boom period	Independent	CRISIS1	Virtual variable: such that if there is an economic crisis within the period of study 1, otherwise, 0 will be assigned			
Financial crisis – financial pressure	Independent	CRISIS2	Altman's criterion is used for measuring financial pressure. The criterion is computed in this paper via the following equation:  EM Score = 6.56*X1 + 3.26*X2 + 6.72*X3 + 1.05*X4 + 3.25  X1 is the working capital to total assets ratio. X2 is accumulated profit to total assets ratio, X3 is profit before interest and tax to total assets, and X4 is book value to total liabilities.  Banks with Altman's criterion of smaller than 1.1 (banks with financial pressure) are known as banks with financial pressure, and banks with Altman's criterion of higher than 1.1 (healthy bank) are known as the bank with no financial pressure.			
Age	Control	AGE	No. of years the bank is established			
Size	Control	SIZE	Natural logarithm of total bank assets			
Capital sufficiency	Control	CAP	Recorded capital of the bank to total assets			
Financial leverage	Control	LEVERAG E	Total liability to total assets ratio			
Fixed assets	Control	PPE	Fixed tangible assets to total assets			

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# 4. Data analysis

## 4.1. Descriptive statistics

The descriptive statistics of research variables are presented in the following table:

**Table 5.** Descriptive statistics of research variables in sample firms

Variable	Obs	Mean	Median	Max.	Min.	Std. dev.	Skewness	Kurtosis
AGE	99	3.073	2.995	4.276	1.791	0.584	0.358	2.523
CAP	99	0.043	0.036	0.128	0.006	0.023	0.126	4.662
CRISIS1	99	0.444	0.000	1.000	0.000	0.499	0.223	1.050
CRISIS2	99	1.636	1.190	5.847	-0.689	1.343	0.415	4.539
DEPOSITS	99	18.717	19.068	20.92	14.79	1.492	-0.720	2.725
LEV	99	18.305	18.878	94.01	-79.64	18.03	-0.109	3.280
LEVERAGE	99	0.930	0.940	1.012	0.814	0.041	-0.863	3.216
LOANS	99	19.01	19.253	21.03	16.18	1.164	-0.451	2.483
MA	99	0.114	0.117	0.232	0.011	0.053	0.019	2.443
POLIT1	99	0.323	0.000	1.000	0.000	0.470	0.755	1.571
POLIT2	99	18.756	0.000	81.01	0.000	27.34	1.278	3.214
SIZE	99	19.368	19.495	21.52	16.44	1.182	-0.377	2.493

Since the panel data method is used for hypothesis testing, the number of year-company observations based on balanced combined data has been 99 year-company (9 years and 11 firms).

# 4.2. Analyzing hypotheses

For analyzing hypotheses and the effect of management ability, political influence, and financial pressure on assets and liability management of banks, the proposed models are used that will be analyzed based on regression models of hypotheses:

# 4.3. Analyzing hypotheses using the first model

For analyzing the effect of management ability, political influence, and financial pressure on assets and liability management – liability to capital ratio, model no. 1 is used, the results of which are as follows:

In the model, the F probability value (or p-value) is 0.00. since this value is lower than 0.05, the null hypothesis is rejected at a 95% confidence level, so there is a significance in the model and a linear relationship between independent and dependent variables.

# H1 analysis:

In this model, the regression test results show that the MA variable's coefficient is a positive the model. By increasing management ability, the value of the variable of assets and liability management – liability to bank capital ratio also increases, and vice versa. Such a relationship is significant statistically at a 95% confidence level because the obtained t value is more than its corresponding value in the table (t0.975= $\alpha$  =196). The calculated p-value in this variable is less than 5%.

#### H2 analysis:

Moreover, the coefficient of the variable of POLITIC1 is negative in the model, which means by increasing political relations – political management, the value of the variable of assets and liability management – liability to bank capital ratio also increases and vice versa. Such a relationship is significant statistically at a 95% confidence level because the obtained t value is more than its corresponding value in the table ( $t0.975=\alpha=196$ ). The calculated p-value in this variable is less than 5%.

The coefficient of the variable of POLITIC2 is positive in the model, which means by increasing political relations – government influence, the value of the variable of

assets and liability management – liability to bank capital ratio also increases and vice versa. Such a relationship is significant statistically at a 95% confidence level because the obtained t value is more than its corresponding value in the table (t0.975= $\alpha$  =196). The calculated p-value in this variable is less than 5%.

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**Table 6.** The results of hypothesis testing based on model 1

Model	$LEV_{it} = \beta + \beta$	$EV_{it} = \beta + \beta_1 MA_{it} + \beta_2 POLITIC1_{it} + \beta_3 POLITIC2_{it} + \beta_4 CRISIS1_{it} + \beta_5 CRISIS2_{it}$						
Model	$+ \beta_6 CAP_{it} + \beta_7 LEVARAGE_{it} + \beta_8 PPE_{it} + \beta_9 AGE_{it} + \beta_{10} SIZE_{it}$							
Variables Coefficients		t statistic	P-value	Result				
Constant	-202.5550	-12.21535	0.0000*	Significant in the model at 95% level				
MA	9.969212	2.026151	0.0462*	Significant in the model at 95% level				
POLITIC1	-3.140682	-2.050481	0.0437*	Significant in the model at 95% level				
POLITIC2	0.254945	2.665006	0.0094*	Significant in the model at 95% level				
CRISIS1	-2.468741	-4.007914	0.0001*	Significant in the model at 95% level				
CRISIS2	0.934464	4.589329	0.0000*	Significant in the model at 95% level				
CAP	36.26163	1.686262	0.0957	No significance in the model				
LEVARAGE	138.5380	8.522547	0.0000*	Significant in the model at 95% level				
PPE	-0.890911	-1.913899	0.0593	No significance in the model				
AGE	-7.913587	-1.897831	0.0614	No significance in the model				
SIZE	6.309518	4.825994	0.0000*	Significant in the model at 95% level				
F test values		67.754	Durbin-Watson test	1.500502				
P-value		0.000000*	$\mathbb{R}^2$	0.945572				
Jarque -Bera	test	0.592	adjusted R <sup>2</sup>	0.931616				
P-value of Jar	que-Bera test	0.744						

## H3 analysis:

the coefficient of the variable of CRISIS1 is negative in the model, which means by increasing financial crisis— economic recession and boom periods, the value of the variable of assets and liability management — liability to bank capital ratio also decreases and vice versa. Such a relationship is significant statistically at a 95% confidence level because the obtained t value is more than its corresponding value in the table (t0.975= $\alpha$ =196). The calculated p-value in this variable is less than 5%.

The coefficient of the variable of CRISIS2 is positive in the model, which means by increasing financial crisis – financial pressure, the value of the variable of assets and liability management – liability to bank capital ratio also increases and vice versa. Such a relationship is significant statistically at a 95% confidence level because the obtained t value is more than its corresponding value in the table (t0.975= $\alpha$  =196). The calculated p-value in this variable is less than 5%.

The coefficient of determination in the model is approximately 94.55%. This coefficient shows that independent variables in the model can justify more than 94% of changes in assets and liability management – liability to bank capital ratio. One of the sufficiency tests of the model is assessing the absence of autocorrelation among model residuals. Autocorrelation causes the t values in the model to be excessively large. Consequently, the coefficients to be significant, wrongly, lead to the false interpretation of the coefficients and the probability of occurrence of error type 2. Durbin-Watson test values are used in order to assess the presence of autocorrelation, which should be between 1.5 and 2.5. In this model, the Durbin-Watson statistic value is equal to 1.50, and values close to 2 indicate the absence of autocorrelation among model residuals. One of the other model sufficiency methods is to assess the normality of regression model errors. According to this hypothesis, regression equation errors should have a normal distribution. The following diagram displays the normality of error values in the model. Since the p-values corresponding to the Jarque-Bera statistic for model residual values (0.74) are more than 5%, the error normality (model residuals) of the model is accepted.

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# 4.4. Analyzing hypotheses using the second model

For analyzing the effect of management ability, political influence, and financial pressure on assets and liability management – deposit to total assets ratio, model no. 2 is used, the results of which are as follows:

**Table 7.** The results of hypothesis testing based on model 2

Model	$Deposits_{it} = \beta +$	Deposits <sub>it</sub> = $\beta + \beta_1 MA_{it} + \beta_2 POLITIC1_{it} + \beta_3 POLITIC2_{it} + \beta_4 CRISIS1_{it} + \beta_5 CRISIS2_{it} + \beta_6 CAP_{it} + \beta_7 LEVARAGE_{it} + \beta_8 PPE_{it} + \beta_9 AGE_{it} + \beta_{10} SIZE_{it} + \varepsilon$								
Variables	Coefficients	t statistic	P-value	Result						
Constant	8.936018	5.104366	0.0000*	Significant in model at 95% level						
MA	0.086067	0.165686	0.8688	No significance in the model						
POLITIC1	0.204699	1.265848	0.2093	No significance in the model						
POLITIC2	-0.029161	-2.887248	0.0050*	Significant in model at 95% level						
CRISIS1	0.117833	1.811940	0.0738	No significance in the model						
CRISIS2	-0.065220	-3.033922	0.0033*	Significant in model at 95% level						
CAP	-5.665080	-2.495278	0.0147*	Significant in model at 95% level						
LEVARAGE	-2.321615	-1.352775	0.1800	No significance in the model						
PPE	-0.052157	-1.061281	0.2918	No significance in the model						
AGE	1.253605	2.847604	0.0056*	Significant in model at 95% level						
SIZE	0.511967	3.709091	0.0004*	Significant in model at 95% level						
F test values		111.978	Durbin-Watson test	2.091242						
P-value	·	0.000000*	$\mathbb{R}^2$	0.966344						
Jarque -Bera t	est	0.804	adjusted R <sup>2</sup>	0.957714						
P-value of Jar	que-Bera test	0.669	·	·						

In the model, the F probability value (or p-value) is 0.00. since this value is lower than 0.05, the null hypothesis is rejected at a 95% confidence level, so there is a significance in the model and a linear relationship between independent and dependent variables.

# H1 analysis:

In this model, the regression test results show that the MA variable's coefficient is a positive in model. By increasing management ability, the value of the variable of total bank deposits also increases, and vice versa. Such a relationship, however, is that much weak statistically that it is not significant at 95% confidence level because, first, the obtained t value is less than its corresponding value in the table  $(t_{=\cdot,9VD\alpha}=196)$  and also the calculated p-value in this variable is more than 5%.

#### H2 analysis:

Moreover, the coefficient of the variable of POLITIC1 is positive in the model, which means by increasing political relations – political management, the value of the variable of total bank deposits also increases and vice versa. Such a relationship, however, is that much weak statistically that it is not significant at 95% confidence level because, first, the obtained t value is less than its corresponding value in the table  $(t_{=-3,340\alpha} = 196)$  and also the calculated p-value in this variable is more than 5%.

The coefficient of the variable of POLITIC2 is negative in the model, which means by increasing political relations – government influence, the value of the variable of total bank deposits decreases, and vice versa. Such a relationship is significant statistically at a 95% confidence level because the obtained t value is more than its corresponding value in the table (t0.975= $\alpha$  =196). The calculated p-value in this variable is less than 5%.

# H3 analysis:

The coefficient of the variable of CRISIS1 is positive in the model. By increasing financial crisis—economic recession and boom periods, the value of the variable of total bank deposits also increases and vice versa. Such a relationship, however, is that much weak statistically that it is not significant at 95% confidence level because, first, the

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obtained t value is less than its corresponding value in the table ( $t_{=\cdot,4V\Delta\alpha}$  =196) and also the calculated p-value in this variable is more than 5%.

The coefficient of the variable of CRISIS2 is negative in the model, which means by increasing financial crisis – financial pressure, the value of the variable of total bank deposits decreases, and vice versa. Such a relationship is significant statistically at a 95% confidence level because the obtained t value is more than its corresponding value in the table ( $t0.975=\alpha=196$ ). The calculated p-value in this variable is less than 5%.

The coefficient of determination in the model is approximately 96.66%. This coefficient shows that independent variables in the model can justify more than 94% of changes in the variable of total bank deposits. In this model, the Durbin-Watson statistic value is equal to 2.09, and values close to 2 indicate the absence of autocorrelation among model residuals. Since the p-values corresponding to the Jarque-Bera statistic for model residual values (0.66) are more than 5%, the error normality (model residuals) of the model is accepted.

### 4.5. Analyzing hypotheses using the third model

For analyzing the effect of management ability, political influence, and financial pressure on assets and liability management – loan to total assets ratio, model No. 3 is used, the results of which are as follows:

**Table 8.** The results of hypothesis testing based on model 3

Table 8. The results of hypothesis testing based on model 3								
	$loans_{it} = \beta$	$= \beta + \beta_1 MA_{it} + \beta_2 POLITIC1_{it} + \beta_3 POLITIC2_{it} + \beta_4 CRISIS1_{it}$						
Model			$RISIS2_{it} + \beta_6 CAP_{it} + \beta_7 LEVARAGE_{it} + \beta_8 PPE_{it} + \beta_9 AGE_{it}$					
	$+ \beta_{10} \text{SIZE}_{\text{it}} + \varepsilon$							
Variables	Coefficients	t statistic	P-value	Result				
Constant	0.653297	1.040158	0.3011	No significance in the model				
MA	-0.256883	-1.076076	0.2848	No significance in the model				
POLITIC1	-0.016824	-0.310618	0.7568	No significance in the model				
POLITIC2	0.000795	0.785425	0.4343	No significance in the model				
CRISIS1	0.065610	2.372822	0.0198*	Significant in model at 95% level				
CRISIS2	0.002266	0.211553	0.8329	No significance in the model				
CAP	-1.381333	-1.345938	0.1818	No significance in the model				
LEVARAGE	-1.253856	-2.006549	0.0479*	Significant in model at 95% level				
PPE	-0.061152	-2.831359	0.0057*	Significant in model at 95% level				
AGE	-0.122876	-2.796349	0.0063*	Significant in model at 95% level				
SIZE	1.080337	42.18684	0.0000*	Significant in model at 95% level				
F test values		842.021	Durbin-Watson test	1.693674				
P-value		0.000000*	$\mathbb{R}^2$	0.389657				
Jarque -Bera test		0.875	adjusted R <sup>2</sup>	0.388482				
P-value of Jai	que-Bera test	0.646						

In the model, the F probability value (or p-value) is 0.00. since this value is lower than 0.05, the null hypothesis is rejected at a 95% confidence level, so there is a significance in the model and a linear relationship between independent and dependent variables.

#### H1 analysis:

In this model, the regression test results show that the MA variable's coefficient is negative. By increasing management ability, the variable of total granted bank facilities' value decreases, and vice versa. Such a relationship, however, is that much weak statistically that it is not significant at 95% confidence level because, first, the obtained t value is less than its corresponding value in the table (t  $_{-0.975}^{\alpha}$  =196) and also the calculated p-value in this variable is more than 5%.

The Role of Management Ability, Political Influence and Financial Pressure in the Assets and Liability Management of Iranian Banks H2 analysis:

Moreover, the coefficient of the variable of POLITIC1 is negative in the model, which means by increasing political relations – political management, the value of the variable of total granted bank facilities decreases and vice versa. Such a relationship, however, is that much weak statistically that it is not significant at 95% confidence level because, first, the obtained t value is less than its corresponding value in the table  $(t_{=...4Y00} = 196)$  and also the calculated p-value in this variable is more than 5%.

The coefficient of the variable of POLITIC2 is positive in the model, which means by increasing political relations – government influence, the value of the variable of total granted bank facilities also increases, and vice versa. Such a relationship is significant statistically at a 95% confidence level because the obtained t value is more than its corresponding value in the table (t0.975= $\alpha$  =196). The calculated p-value in this variable is less than 5%.

H3 analysis:

The coefficient of the variable of CRISIS1 is positive in the model. By increasing financial crisis— economic recession and boom periods, the value of the total granted bank facilities' value also increases, and vice versa. Such a relationship is significant statistically at a 95% confidence level because the obtained t value is more than its corresponding value in the table (t0.975= $\alpha$  =196). The calculated p-value in this variable is less than 5%.

The coefficient of the variable of CRISIS2 is positive in the model, which means by increasing financial crisis – financial pressure, the value of the variable of total granted bank facilities also increases, and vice versa. Such a relationship, however, is that much weak statistically that it is not significant at 95% confidence level because, first, the obtained t value is less than its corresponding value in the table ( $t_{=\cdot,4V\delta\alpha}$  =196) and also the calculated p-value in this variable is more than 5%.

The coefficient of determination in the model is approximately 38.96%. This coefficient shows that independent variables in the model can justify more than 38% of changes in the variable of total granted bank facilities. In this model, the Durbin-Watson statistic value is equal to 1.69, and values close to 2 indicate the absence of autocorrelation among model residuals. Since the p-values corresponding to the Jarque-Bera statistic for model residual values (0.64) are more than 5%, the error normality (model residuals) of the model is accepted.

#### 5. Conclusion

The obtained results from hypothesis analysis show that, first, management ability contributes to liability to capital ratio and assets and liability management. However, there is no significant statistical relationship between management ability and deposit to assets ratio and loan to assets ratio. Second, there is a significant inverse statistical relationship between political management and state-owned ownership and liability to capital ratio. Moreover, state-owned ownership would lead to a significant increase in the deposit to assets ratio. However, no relationship is evident between political management and deposit to assets ratio and between political management and state-owned ownership and loan to property ratio. Third, the relationship between economic periods and the financial pressure of banks is negative and positive. Statistically, the relationship between financial pressure and assets to deposit ratio is inverse and significant, and the relationship between economic periods and loan to assets ratio is positive and significant. However, there is no significant relationship between economic periods and deposit to assets ratio and banks' financial pressure and loan to assets.

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The results obtained from the first hypothesis show that improving the level of ability and expertise in bank management can necessarily lead to the improvement of banks' assets and liability and increase the liability to capital ratio of banks. Such a result, in fact, indicates that enhancing management ability can increase the power of deposit absorption and enhance the proportion of supplied resources from deposits, compared with bank capital. This indicates policies adopted by the management that can direct a larger proportion of banking industry deposits toward banks under its management. Efficient management by decreasing credit risk, liquidity risk, and bankruptcy risk can actually cause the country's investors to invest a considerable proportion of their banks' resources, so the proportion of bank liability and capital will increase.

The results obtained from the second hypothesis show that political management and the presence of a board member in the banking structure have caused the decline of the liability to capital ratio. This occurred due to the inefficiency of state-owned management in the bank management structure. An increase in the number of governing board members in the board structure has caused the decline of deposit absorption ability and capital to liability ratio. Besides, the results show that state-owned ownership has increased the capital to liability ratio. This can indicate the use of state-owned facilities for banks with no such governmental ownership. In these banks, it is possible to absorb higher deposits and allocate a higher proportion of total banking industry deposit, which will increase liability to the capital ratio, which indicates strengthening the ability to absorb the deposit of banks with higher governmental ownership.

The third hypothesis results reveal that economic recession and financial pressure periods have an inverse and direct effects on liability to capital ratio, respectively. During the recession period, banks can absorb less deposit, decreasing liability to capital ratio because the amount of absorbed deposit is declined in the bank's liability structure. Moreover, banks with financial pressure usually suffer from extremely low capital sufficiency and the amount of their capital, given the volume of liabilities and assets, is trivial. Accordingly, banks with financial pressure have a high liability to capital ratio. On the other hand, banks with high financial pressure have more leverage and a higher liability ratio, leading to increased liability to capital ratio. Besides, the increase of financial pressure leads to the decline of the deposit to property ratio, which is also expectable. Banks with financial pressure can absorb fewer resources. Since they deal with high credit risks, the return of granted resources to the facility provision cycle will be prolonged, and consequently, the proportion of their deposits will be declined. Finally, the proportion of loans to total assets increases during economic recession periods, because on the one hand, there is a limitation in absorbing deposit, and on the other hand, during economic recession periods, one of the major policies of the government is to provide loan to move out of economic recession, so the amount of loans increases in proportion to total assets.

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Research Article

# The Impact of Shareholders Participation in Annual Meetings on Earnings Management and Financial Restatement

#### Masoumeh Behrouzi Yekta\*

Faculty of Economics and Administrative Sciences, Binaloud Institute of Higher Education, Binaloud, Iran

#### Abstract

The current study aims to assess the impact of the shareholders' participation in annual meetings on earnings management and financial restatement. Research hypotheses were examined using a sample of 768 firm-years observations on the Tehran Stock Exchange during 2012-2017. By using the multivariate regression model. The results show a negative and significant relationship between shareholders' partnership in annual meetings and both accrual and real earnings management. Moreover, the results indicate a positive and significant relationship between the shareholders' participation in annual meetings and financial restatement.

**Keywords:** Accrual-based earnings management, Financial restatement, Real earnings management, Shareholders participation in annual meetings

\*Corresponding Author: Department of Accounting, Email: ma.behrouzi.66@gmail.com



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#### 1. Introduction

Investors are more willing to invest and transact the shares of those firms that appropriately present their reporting quality and information disclosure. Hence, the higher the disclosure quality of financial statements, the higher the financial reports' efficiency. Consequently, the less is the costs of public information processing, which lead to more transactions on that firm's shares through investment (Brown & Hilliest, 2007).

Among the annual concerns is an insignificant presence of shareholders' participation in annual meetings. According to Almutariri (2019), the tools of firms' strategic principles can cause the firm's better performance in specific situations. The shareholder asks for a higher return in the long run for his/her investment. An effective evaluation structure should be established to respond to this inquiry, and harmony should be achieved between management and shareholder. Besides, high participation rates lower the chance for large shareholders (Almutariri, 2019).

According to Seeger (2002), the meeting of shareholders in developed countries brings about several primary legal responsibilities. The most significant responsibility is supervisory board selection, which is assumed to reflect shareholders' interests in the firm. In turn, the supervisory board selects the management and appraises management measures to ensure that they align with shareholders' interests. Schipper (1989) defines earnings management as an intentional intervention in reporting outside the organization to obtain personal benefits from managers and shareholders' sides. Ronen and Yaari (2008) consider earnings management a set of managerial decisions that do not report short-term known management facts to maximize earnings value. Declaration No. 1 of the compilation board of Financial Accounting Standards Committee of America (1987) states that "the main goal of financial reporting is to provide the information that is provided by profit measurement and its constituting components and is indicative of the performance of the business firm" (Hendriksen, 1982). Earnings management is a type of earnings manipulation that is likely to decrease earnings reliability. The less reliable the earnings, the less useful information they carry.

On the other hand, when opportunistic earnings management is controlled using supervisory systems, accounting earnings are more reliable and contain more useful information (Dechow et al., 1995). Watts and Zimmerman (1986) declare that earnings management means the manager uses his freedom of action on accounting figures to assume the presence or absence of existing limitations in this field. According to Giroux (1992), earnings management includes a broad spectrum from conservative accounting to modified or unbiased accounting. It continues with violation and bias from principles, rules, agreements, or aggressive accounting and finally ends with fraudulent accounting, so we are faced with an extensive field of personal judgment in accounting, which has persuaded the managers to manipulate the profit. The motives for purposeful financial restatement can be classified into three groups:

The first group is the motivation of those firms that have a problem with low profitability and liquidity. These firms are more willing to improve their results by fraudulent measures and making intentional mistakes. The second group is the motivation of firms willing to satisfy the market's needs and predictions by making fraudulent and deliberate mistakes. The third group is the motivation resulted from some contracts. Stock value and firm performance bonus contracts are a sample of such agreements (Palmrose et al., 2004). The board is the main controlling factor of firm management and in charge of protecting shareholders' interests. This role originated from the agency theory and is the oldest role of the board.

Although financial restatement is not a new phenomenon, accounting mismanagement or fraud and the number and the cost of firm earnings restatement have

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recently experienced a considerable increase due to the presence of aggressive accounting practices, so the issue gained increasing interest among most of the investors, analysts, and regulators (Wu, 2002). Earnings restatement and other financial information of previous years of firms are of great importance due to errors found in mathematical calculations, mistakes in applying accounting policies, and incorrect interpretation or ignoring the existing realities in providing these statements (Lev, 2003). Gertsen et al. (2006) classified financial restatement based on the management's intention and degree of distortion of information relatedness. The bulk of frequent financial restatement has brought about the doubt of financial statement users about the position of financial reporting, especially the auditing process in protecting public interests (Thompson & Larson, 2004).

According to Lev (2003), the modifying errors of income realization is the leading cause of financial restatement, and it seems that firms with modern technology are more willing to carry out financial restatement, such that more than one-third of the cases in the U.S. are related to high-tech firms and industries. Plumlee and Yohn (2009) carried out a study on the reasons for financial restatements and concluded that in most cases, the cause of the issue is internal errors of the firms. Protecting shareholders' interests obliges the management to present correct, honest, and flawless financial statements to shareholders, so the chance of financial restatement can be decreased with major external shareholders due to better managerial supervision (Abdullah et al., 2010).

#### 2. Literature Review and Hypotheses Development

Demirkan (2007) shows that the small investors try to deal in time of presenting financial restatement and the reaction of this group is a function of whether restatement by the firm is recommended or obliged by the Financial Standards Committee or without considering the reason for restatement (including income identification, financial restructuring). This is while large investors thoroughly consider both the cause and the institution or unit of the restatement. This study shows that large investors analyze the probable problems, make more logical decisions for restatement, and deal before presenting restatement. Those firms were studied in this paper that embark on financial restatement due to accounting errors. According to Demirkan (2007), the cause of the difference in reacting to large investors, compared with small investors, is having access to more powerful resources and financial analysts for making appropriate economic decisions. According to this study, large investors decrease their investment in the related firm at least three months before presenting financial restatement.

Bowen et al. (2018) analyzed the effect of reporting motivations on financial restatement in the American market and other international markets. The results of this paper show that in case rules and regulations are numerous in the global markets. There is no significant difference in the number of restatements due to differences in standards. Further, those firms that are more aligned with the rules and regulations and have more arrangements are less willing to restate and manipulate the earnings. Roychowdhury et al. (2012) discover that earnings management has a closer and more detectable relationship with performance weakening after the secondary supply of stock in the market when such earnings management is carried out through manipulating real activities. Herly (2012) figured out that firms' earnings quality with financial restatement in the year of restatement and ten years before that is lower than similar firms with no financial restatement.

Moreover, this study indicates a decrease of difference between firms' earnings quality with the restatement and the control group after restatement. Kim and Sohn (2013) assess the relationship between capital cost and earnings management. Scholars discovered that capital cost is positively under the influence of real earnings

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management after accrual-based management control. Enomotoa et al. (2015) find that those countries with more thought rules about backing shareholders' rights are more willing to impose real earnings management. Sohn (2016) concluded that accounting information comparability leads to the decline of accrual-based earnings management and increased real earnings management. According to the previous studies on the impact of shareholders participation in annual meetings on earnings management and financial restatement and the significance of the issue, the first and second hypotheses of the study are as follows:

H<sub>1</sub>: There is a significant relationship between shareholders' participation in annual meetings and financial restatement.

H<sub>2</sub>: There is a significant relationship between shareholders' participation in annual meetings and financial restatement severity.

Since shareholders contribute to their share in firm profits and firm loss would cause the decline of profits or loss to shareholders, it is quite natural that they have the right to be informed of firm status. Participation is a process for utilizing the individual or group competencies of beneficiaries to achieve a group objective. In this process, conscious behaviour, collective demand, collective acceptance, selection, and mutual needs are important. This paper aims to measure the severity of financial restatement regarding previous studies. By following Livant and Tan's (2004) studies and Hirschey et al. (2012), annual adjustments were carried out in the years under study are used. Annual adjustments mean the items of the previous years accumulated in the adjustment of profit residual (loss) were considered at the beginning of the period and limited to those items resulting from a change in accounting policy and significant error modification of the previous periods.

H<sub>3</sub>: There is a significant relationship between shareholders' participation in annual meetings and accrual-based earnings management.

H<sub>4</sub>: There is a significant relationship between shareholders' participation in annual meetings and real earnings management.

Accrual-based earnings management is computed using a change in accounting methods and performed estimations and causes the accounting profit to get closer to the objective without leaving a cash effect. Similar to a change in assets depreciation method (Rahmani and Ghashghaei, 2017), real earnings management occurs with a change in the scheduling or structure of real commercial activities (Leggett et al., 2009). In the real earnings management method, management manipulates some effective earnings to reach the desired level. The manipulation of real activities contributes directly to cash flow (and some accruals). Roychowdhury (2006) considers three methods for real earnings management: change in sales scheduling (like offering a discount, credit terms), change in optional costs (like change in research and development costs, advertisement, etc.), and change in production volume (arranging the amount of production, surplus production costs) (Rahmani and Ghashghaei, 2017).

#### 3. Research Methodology

Since it is carried out within a 6-year time interval during 2012-2017, it can be classified in retrospective research types since the user data are real and historical. Correlation among variables is determined using a correlation coefficient, and the range of changes of one or several variables is studied by the variety of changes of one or several other variables

In this paper, to collect data related to the empirical section and research hypothesis testing, data related to independent variable were gathered from audited financial statements of listed firms on the Tehran Stock Exchange, which are available on the website of the study, Islamic studies, and development, the official website of Tehran

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Stock Exchange, and also from Tehran Stock Exchange databank (Iran Securities, Tadbir Pardaz, and Rah Avard-e Novin Software).

#### 3.1. Statistical population and sample

This study's statistical population includes listed firms on the Tehran Stock Exchange from all industries during the study. The sample of this study is selected using the systematic elimination method, and firms with the following conditions were selected among the listed on the Tehran Stock Exchange:

- 1- They should not be affiliated with financial intermediaries, holdings, and banks, because such firms are different from other firms in terms of nature of activity and classification of financial statement items;
- 2- Firm transactions should not be halted completely during the period of the study (corporate icon being eliminated from the Stock Exchange);
- 3- Firms should be enlisted at least from the beginning of 2012 on the Tehran Stock Exchange; and,
- 4- All required data should be available from firms during the period of the study.

By considering the abovesaid conditions, several 128 firms remain, indicating the real statistical population.

## 3.2. Data analysis and hypothesis testing method Fitted patterns for hypothesis testing

In this paper, the following multivariate logistic regression models are used: Model (1) is used for testing the first hypothesis:

Model (1)

$$\begin{split} REST_{i,t} &= \alpha_0 + \alpha_1 Shop_{i,t} + \alpha_2 Psh_{it} + \alpha_2 M. Tenure_{i,t} \\ &+ \alpha_3 M. Change_{i,t} + \alpha_4 Audit. Tenure_{i,t} + \alpha_5 Blnd_{i,t} \\ &+ \alpha_6 M. Sh_{i,t} + \alpha_7 Own_{i,t} + \alpha_8 M. D_{i,t} + \alpha_9 Size_{i,t} \\ &+ \alpha_{10} Lev_{i,t} + \alpha_{11} RoA_{i,t} + \alpha_{12} Age_{i,t} \\ &+ \alpha_{13} growth \ sales_{i,t} + \alpha_{14} MTB_{i,t} + \alpha_{15} Loss_{i,t} \\ &+ \alpha_{16} Industry_{i,t} + \alpha_{17} year_{i,t} + \varepsilon_{i,t} \end{split}$$

Model (2) is used for testing the second hypothesis:

Model (2)

$$\begin{split} SREST_{i,t} \\ &= \alpha_0 + \alpha_1 Shop_{i,t} + \alpha_2 Psh_{it} + \alpha_2 M. Tenure_{i,t} \\ &+ \alpha_3 M. Change_{i,t} + \alpha_4 Audit. Tenure_{i,t} + \alpha_5 Blnd_{i,t} \\ &+ \alpha_6 M. Sh_{i,t} + \alpha_7 Own_{i,t} + \alpha_8 M. D_{i,t} + \alpha_9 Size_{i,t} \\ &+ \alpha_{10} Lev_{i,t} + \alpha_{11} RoA_{i,t} + \alpha_{12} Age_{i,t} \\ &+ \alpha_{13} growth \ sales_{i,t} + \alpha_{14} MTB_{i,t} + \alpha_{15} Loss_{i,t} \\ &+ \alpha_{16} Industry_{i,t} + \alpha_{17} year_{i,t} + \varepsilon_{i,t} \end{split}$$

Model (3) is used for testing the third hypothesis: Model (3)

 $AE.M_{i,t}$ 

$$\begin{split} & = \alpha_0 + \alpha_1 Shop_{i,t} + \alpha_2 Psh_{it} + \alpha_2 M. Tenure_{i,t} \\ & + \alpha_3 M. Change_{i,t} + \alpha_4 Audit. Tenure_{i,t} + \alpha_5 Blnd_{i,t} \\ & + \alpha_6 M. Sh_{i,t} + \alpha_7 Own_{i,t} + \alpha_8 M. D_{i,t} + \alpha_9 Size_{i,t} \\ & + \alpha_{10} Lev_{i,t} + \alpha_{11} RoA_{i,t} + \alpha_{12} Age_{i,t} \\ & + \alpha_{13} growth \ sales_{i,t} + \alpha_{14} MTB_{i,t} + \alpha_{15} Loss_{i,t} \\ & + \alpha_{16} Industry_{i,t} + \alpha_{17} year_{i,t} + \varepsilon_{i,t} \end{split}$$

Model (4) is used for testing the fourth hypothesis: Model (4)

$$RE.M_{i.t}$$

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 \begin{aligned} &= \alpha_0 + \alpha_1 Shop_{i,t} + \alpha_2 Psh_{it} + \alpha_2 M. Tenure_{i,t} \\ &+ \alpha_3 M. Change_{i,t} + \alpha_4 Audit. Tenure_{i,t} + \alpha_5 Blnd_{i,t} \\ &+ \alpha_6 M. Sh_{i,t} + \alpha_7 Own_{i,t} + \alpha_8 M. D_{i,t} + \alpha_9 Size_{i,t} \\ &+ \alpha_{10} Lev_{i,t} + \alpha_{11} RoA_{i,t} + \alpha_{12} Age_{i,t} \\ &+ \alpha_{13} growth \ sales_{i,t} + \alpha_{14} MTB_{i,t} + \alpha_{15} Loss_{i,t} \\ &+ \alpha_{16} Industry_{i,t} + \alpha_{17} year_{i,t} + \varepsilon_{i,t} \end{aligned}
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Where:

AEM: accrual-based management

*REM*: real earnings management

*Psh*: the percentage of shareholders' presence in annual meetings is equal to the amount of partnership of shareholders extracted from the decision declaration of the annual general meetings available on the Codal Website.

*REST*: restatement, a dummy variable which means if the firm understudy has had restatement 1, otherwise, 0.

*Srest*: the amount of financial statement severity is equal to the annual adjustment that leads to financial restatement in the year under study divided by total assets.

*Shop*: auditor opinion shopping, which means if financial statements of the previous year were restated in the year under study, the report of the previous year is plausible, and if the employer did not change his auditor in the current year 1, otherwise, 0.

*Mtenure*: CEO tenure, the period the CEO consistently has been the CEO of the firm. Mchange: CEO change, if the CEO changes in the year under study 1; otherwise, 0.

*BIND*: board composition, the number of unbounded board members to total board members.

*ROA*: Return on assets, which are calculated according to net annual income to total assets.

*LEV*: financial leverage, which is achieved from the debt ratio (total debts divided by total assets).

*Growth sales*: sales growth is equal to sales of the current year minus sales of the previous year divided by sales of the previous year.

Age: firm age, which is equal to the number of years passed from firm establishment data.

Audit tenure: auditor tenure, the duration the auditor is in charge of the position.

*M.SH*: board ownership, the number of stocks available to the board divided by total published stocks.

*Own*: institutional ownership, the amount of stock available to public institutions, insurance, financial institutions, investment firms, and all state-owned institutions divided by total published stocks.

*MD*: CEO of duality. Suppose the CEO is the board director or vice-presiden1; otherwise, 0.

Size: firm size, which is equal to the market value of firm assets.

Loss: firm loss, if the firm is losing in the year under study 1; otherwise, 0.

MTB: book value to market value of firm equity.

*Industry*: dummy variable for controlling the industry effect.

Year: dummy variable for the year.

#### 4. The Results

The collected data were arranged using the Excel Software; then, after the required

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modifications and classifications, the Stata 14 Software was entered for processing based on the study variables. Before testing the research hypotheses and final fitting of the model, descriptive statistics (central and dispersion indices, namely mean, median, the standard deviation of a range of changes, etc.) were analyzed.

#### 4.1. Descriptive statistics

The first stage of data analysis is describing or purifying them using descriptive statistics.

This study's descriptive findings include the mean, median, standard deviation, minimum observation, and maximum observation. It is worth mentioning that the number of firms understudy is 128, which is collected for six consecutive years. Descriptive statistics are summarized in Table 1.

**Table 1.** Descriptive statistics

Sing	Variable	Mean	Std. dev.	Min	Max
REM	Real earnings management	0.154	0.865	0.002	0.606
AEM	Accrual-based earnings management	0.082	0.845	0.000	0.481
REST	financial statement of the year	0.799	0.401	0.000	1.000
SREST	financial statement severity of the year	0.001	0.898	-1.750	0.393
PSH	Shareholders' participation	0.795	0.235	0.000	3.110
shop	Opinion shopping	0.518	0.499	0.000	1.000
M tenure	CEO tenure	3.452	2.689	1.000	14.000
M change	CEO change	0.268	0.443	0.000	1.000
Audit tenure	Auditor change	3.762	3.981	1.000	16.000
Bind	Board composition	0.715	0.183	0.000	1.000
M s h	CEO ownership	0.217	0.289	0.000	0.954
own	Institutional ownership	0.557	0.346	0.000	0.99
MD	CEO duality	0.252	0.435	0.000	1.000
MTB	Book value to market value of equity	3.327	8.336	-114.477	103.153
LOSS	Virtual variable of loss	0.133	0.339	0.000	1.000
SIZE	Firm size	14.265	1.526	10.533	19.374
LEV	Financial leverage	0.611	0.264	0.090	4.003
ROA	Return on assets	0.091	0.583	-12.273	2.618
Growthsale	Sales growth	0.207	0.519	-0.845	7.705
Age	Firm age	38.436	12.739	10.000	66.000

Furthermore, information related to the descriptive statistics of qualitative variables is depicted below.

**Table 2.** Descriptive statistics of qualitative variables

One			Zero	Total		
Variable	Frequency	Frequency percentage	Frequency	Frequency percentage	Frequency	Frequency percentage
Rest	614	79.95	154	20.05	768	100
Shop	398	51.88	370	48.18	768	100
Mchange	206	26.82	562	73.18	768	100
MD	192	25.23	569	74.77	761	100
Loss	102	13.28	666	86.72	768	100

#### 4.2. Results of unit root test of variables

In economic data, it is assumed that there is a long-term and balanced relationship between the proposed variables in economic theory. In applied econometric analyses, to estimate long-term connections among variables, their mean and variance are considered during a fixed time independent of the time factor so that an implicit fixed behavior will be assumed for them, given that the presence of nonstationary variables in the model will cause the classic tests of F and t not to have the required credit. Under such circumstances, the implemented regression is not something more than a pseudo

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kind.

Hadri proposed a test in 2000, which is known as the Lagrange coefficient test (LM) based on residuals. In this test, the null hypothesis is indicative of no unit root in each time series of panel data, and the opposite hypothesis points to the presence of unit root in panel data. The Hadri test is similar to the KPSS test, which is generalized from the time series to panel data. This test is based on the residuals of ordinary least squares of

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the estimation method obtained by regressing  $y_{it}$  intercept or intercept and time procedure. By evaluating the unit root for research data, all variables are at no unit root level (stationary). The results of the Hadri unit root test are presented as follows:

**Table 3.** The results of the Hadri unit root test

Variable	Level	Variable	Level
Rest	0.4044	MSH	0.2897
Shop	0.9875	Own	0.2154
EM	0.1897	MD	0.7895
Audit.Tenure	0.9998	Size	0.2154
Mchange	0.2357	LEV	0.8530
LnFee	0.2853	ROA	0.8284
Mtenure	0.4580	Age	0.3325
Blnd	0.7713	MTB	0.4044

#### 4.3. Research model fitting

We should first determine whether the data are pooled or panel using the F test for model estimation. The null hypothesis in this test shows the pooled data, and the hypothesis one indicates panel data. After performing the F test, H0 is rejected. The question here is that based on which models of fixed effect or random effect do the model is analyzable, determined by the Hausman test. Concerning the synthesis test results presented in the following tables, the null hypothesis concerning pooled data shows confidence at a 99% level for research data, so the panel data model should estimate these four models' coefficients.

**Table 4.** The results of the synthesis test based on Iranian data

	Calculated statistic	Probability level
Model 1	2.76	0.000****
Model 2	2.91	0.000****
Model 3	1.92	0.000***
Model 4	3.62	0.000***

#### 4.4. Test for determining the effects

There are generally two methods for estimating the panel data model. These two methods are called fixed effects and random effects. Hausman test is used to determine an appropriate method for model estimation, through which the coefficients of the model should be estimated based on two estimators. Then, the significance of the difference is tested between estimated coefficients. Should the difference be significant, the model with fixed effects has priority over random effects?

**Table 5.** The results of the Hausman test based on data

	Calculated statistic	Probability level
Model 1	3223.89	0.000****
Model 2	6.68	0.9789
Model 3	13.31	0.6496
Model 4	75.97	0.000***

# The Impact of Shareholders Participation in Annual Meetings on Earnings Management and Financial Restatement

## 4.5. Model estimation and interpreting the results 4.5.1. Model fitting related to the first hypothesis

Table 6 and the obtained results show a positive and significant relationship between the amount of shareholders' participation in annual meetings and financial restatement at a 99% confidence level. Its p-value is 0.000 lower than the 0.05 significance level. Its coefficient is the positive figure of 0.00004, which is indicative of a positive and significant relationship between these two variables. Hence, the higher the amount of shareholders' participation in annual meetings, the higher is financial restatements.

**Table 6.** The results of the model (1) estimation

CONTROL CONTROL						
	COEF.	STD.Err	Z	p-value		
SHOP	0.35283	0.02686	13.13	0.000		
PSH	0.00004	0.00005	7.95	0.000		
MTENURE	0.02122	0.01216	1.75	0.083		
MCHANGE	0.08911	0.03529	2.52	0.012		
AUDIT.CHANGE	-0.03472	0.00455	-7.63	0.000		
BLND	-0.22603	0.08829	-2.56	0.012		
MSH	-0.11536	0.06149	-1.88	0.063		
OWN	0.21628	0.06411	3.37	0.001		
MD	0.05729	0.02603	2.20	0.028		
SIZE	0.02602	0.00905	2.88	0.004		
LEV	0.04395	0.02251	1.95	0.054		
ROA	-0.06808	0.03472	-1.96	0.050		
AGE	0.00236	0.00131	1.81	0.071		
GROWTHSALES	-0.36569	0.10721	-3.41	0.001		
MTB	-0.00978	0.00574	-1.70	0.091		
LOSS	0.50682	0.10828	1.91	0.058		
Constant	1.38562	0.65001	2.13	0.033		
Number of obs.	739	•		•		
Adj. R - squared	0.8964					

#### 4.5.2. Model fitting related to the second hypothesis

According to Table 7, there is a negative and significant relationship between the amount of shareholders participation in annual meetings and financial restatement at 95% confidence level because its p-value is 0.0005 lower than the 0.05 significance level and its coefficient is the negative figure of 0.0041, showing a negative and significant relationship between these two variables. Hence, the higher the amount of shareholders' participation in annual meetings, the less is the severity of financial restatements.

**Table 7.** The results of the model (2) estimation

	COEF.	STD.Err	Z	p-value
SHOP	-0.03058	0.00997	-3.07	0.002
PSH	-0.00409	0.00146	-2.79	0.005
MTENURE	0.00556	0.00217	2.56	0.010
MCHANGE	0.05646	0.02561	2.20	0.027
AUDIT.CHANGE	-0.00972	0.00522	-1.86	0.063
BLND	-0.05816	0.02078	-2.80	0.005
MSH	0.03006	0.00881	3.41	0.001
OWN	-0.01742	0.01043	-1.67	0.095
MD	0.04184	0.00986	4.24	0.000
SIZE	0.00361	0.00189	1.90	0.057
LEV	-0.06272	0.03310	-1.90	0.059
ROA	0.00358	0.00037	9.62	0.000
AGE	0.00317	0.00174	1.82	0.072
GROWTHSALES	0.03823	0.01446	2.64	0.009
MTB	-0.01091	0.00457	-2.39	0.017
LOSS	0.01264	0.00760	1.66	0.096
Constant	-0.00162	0.04327	-0.04	0.970
Number of obs.	739			
Adj. R - squared	0.8584	·		·

#### 4.5.3. Model fitting related to the third hypothesis

According to Table 8, there is a negative and significant relationship between the amount of shareholders participation in annual meetings and financial restatement at 95% confidence level because its p-value is 0.025 lower than the 0.05 significance level, and its coefficient is the negative figure of 0.0099 showing a negative and significant relationship between these two variables. Hence, the higher the amount of shareholder participation in annual meetings, the less accrual-based earnings management.

**Table 8.** The results of the model (3) estimation

	COEF.	STD.Err	Z	p-value
SHOP	0.47987	0.24419	1.97	0.052
PSH	-0.00999	0.00444	2.25	0.025
MTENURE	-0.01774	0.00991	-1.79	0.074
MCHANGE	0.13210	0.05321	2.48	0.014
AUDIT.CHANGE	-0.03694	0.01624	-2.27	0.024
BLND	0.26448	0.11442	2.31	0.023
MSH	0.34669	0.15233	2.28	0.025
OWN	-0.08352	0.04702	-1.78	0.076
MD	-0.09558	0.14859	-3.72	0.000
SIZE	0.08376	0.04531	1.85	0.064
LEV	-0.85871	0.02724	-31.52	0.000
ROA	-0.04910	0.02061	-2.38	0.017
AGE	-0.00345	0.01272	-1.92	0.054
GROWTHSALES	-0.07385	0.03395	-2.18	0.030
MTB	0.00437	0.00097	4.49	0.000
LOSS	-0.11890	0.06755	-1.76	0.08
Constant	0.03978	0.03775	1.05	0.292
Number of obs.	739			
Adj. R - squared	0.9516			

#### 4.5.4. Model fitting related to the fourth hypothesis

According to Table 9, there is a negative and significant relationship between the amount of shareholders participation in annual meetings and financial restatement at 95% confidence level because its p-value is 0.004 lower than the 0.05 significance level and its coefficient is the negative figure of 0.0075, showing a negative and significant relationship between these two variables. Hence, the higher the amount of shareholders' participation in annual meetings, the less is real earnings management.

**Table 9.** The results of the model (4) estimation

	COEF.	STD.Err	Z	p-value
SHOP	-0.00873	0.00415	-2.10	0.035
PSH	-0.00756	0.00258	-2.93	0.004
MTENURE	0.00922	0.00222	4.15	0.000
MCHANGE	-0.1053	0.00511	-2.06	0.039
AUDIT.CHANGE	0.00135	0.00073	1.84	0.066
BLND	-0.09056	0.02474	-3.66	0.000
MSH	-0.03174	0.00643	-4.93	0.000
OWN	-0.01873	0.00374	-5.01	0.000
MD	-0.01267	0.00565	-2.24	0.025
SIZE	0.00219	0.00115	1.90	0.057
LEV	0.02810	0.01361	2.07	0.039
ROA	0.04621	0.01412	3.28	0.001
AGE	-0.03188	0.01499	-2.13	0.035
GROWTHSALES	0.13751	0.00451	30.48	0.000
MTB	0.00165	0.00085	1.94	0.053
LOSS	-0.00172	0.00093	-1.85	0.063
Constant	0.23223	0.10901	2.13	0.034
Number of obs.	738	·		
Adj. R - squared	0.8404			

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#### **Impact** 5. Conclusion

The hypothesis testing results show a positive and significant relationship between the amount of shareholders' participation in annual meetings and financial restatement. By increasing the amount of shareholders' participation in annual meetings, financial restatement goes up. The present study is concerned about the relationship between the amount of shareholders' participation in annual meetings and financial restatement severity. The study results show a negative and significant relationship between the amount of shareholders' participation in annual meetings and financial restatement severity, which means the amount of shareholders' participation in annual meetings would reduce financial restatement severity in firms. Moreover, the results of hypothesis testing show that there is a negative and significant relationship between the amount of shareholders participation in annual meetings and accrual-based earnings management, which means the amount of shareholders participation in annual meetings would lead to the increase of motivation and competence of managers in accrual-based earnings management. On the other hand, this paper analyzed the amount of shareholders' participation in annual meetings and real earnings management. This paper's results indicate a negative and significant relationship between the amount of shareholders' participation in annual meetings and real earnings management, which means the higher the amount of shareholders participation in annual meetings, the less the real earnings management. This finding is in line with Demirkan (2007), who declares a negative and significant relationship between shareholders' participation in annual meetings and earnings management and financial restatement.

In contrast, Pergola (2006) state that there is no significant relationship between firm governance and the amount of shareholders participation in annual meetings and financial restatement and earnings management because voting in firm meetings and attending these sessions are among the most effective ways of investment that would lead to the decline of earnings management at the firm level.

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**Research Article** 

## **How Managers and Audit Committee Affect Internal Control Weakness**

Seyed Mohsen Hosinian

Faculty of Economics and Administrative Sciences, Attar Institute of Higher Education, Mashhad, Iran

#### **Abstract**

This paper assesses how the board, CEO, and audit committee's characteristics influence internal control weakness. In order to test the hypotheses, data of listed companies on the Tehran Stock Exchange during 2012-2016 are collected. Panel data analyses indicate that managerial education level and audit committee independence inversely influence internal control weakness. However, there is no significant relationship between managers' or audit committees' other characteristics and internal control weakness.

**Keywords:** Internal Control Weaknesses, Board Characteristics, CEO Characteristics, Type of Audit Report

\*Corresponding Author: Department of Accounting, Email: S.M.hosein.66@gmail.com



#### 1. Introduction

The internal control aims to reach the objectives, which are classified into one or several distinctive, and at the same time, similar groups (International Standard 315). Such a definition of internal control is general and inclusive due to its focus on the internal control subsets. For example, we could separately concentrate on the controls dominating the financial reporting or those on the terms and conditions.

According to Paragraph 302 of this Act, management is bound to disclose all existing internal control weaknesses in its quarterly and annual reports (Sarbanes-Oxley Act). The main objective of sections 302 and 404 of the Sarbanes-Oxley Act is to inform the investors of the disclosure of internal control weaknesses, which may increase the financial errors and decrease managers' ability for the earnings management.

After the financial scandals, the Sarbanes-Oxley Act's provision attracted the management's attention to internal controls, more increasingly, and several requirements imposed to public companies that in terms of variation and the scope of effectiveness are considered as thorough and penetrative. The Sarbanes-Oxley Act's significance is to justify the effectiveness of internal control weaknesses, which is the topic of many conducted studies on the determining factors, the effects, and the results of material internal controls' weaknesses.

In Iran, the Stock Exchange has recently embarked on the publication of a draft internal control guideline for those publishers listed on the Tehran Stock Exchange, based on which the management is responsible for monitoring the effectiveness of internal control and should provide reports on the results of internal control evaluation (Tehran Stock Exchange guideline, 2012).

#### 2. Literature Review and Hypothesis Development

After the financial scandals, the Sarbanes-Oxley Act's provision attracted the management's attention to internal controls, more increasingly and several requirements imposed to public companies that in terms of variation and the scope of effectiveness are considered as thorough and penetrative. The Sarbanes-Oxley Act's significance is to justify the effectiveness of internal control weaknesses, which is the topic of many conducted studies on the determining factors, the effects, and the results of material internal controls' weaknesses. Skaife et al. (2007) indicated a relationship between the weak point and the firm characteristics, including firm complication, organizational changes, firm size, profitability, and investing resources on internal controls (Skaife et al., 2007).

In Iran, the Stock Exchange has recently embarked on the publication of a draft internal control guideline for those publishers listed on the Tehran Stock Exchange, based on which the management is responsible for monitoring the effectiveness of internal control and should provide reports on the results of internal control evaluation (Tehran Stock Exchange guideline, 2012).

In most cases, internal control weaknesses, which the auditor reported, are mentioned in the management letter. Still, there is a difference between those weaknesses reported in the management letter and those disclosed in the auditor's report and by the legal inspector. The latter type is material internal weaknesses disclosed in the auditor's report due to their significance. The management letter is optional and has no predefined standard shape. Ther report is important due to the following reasons:

- 1- Improving the relationships with the management, and;
- 2- Suggesting those tax and managerial services that audit firms cannot propose (Brown and Lim, 2012).

Therefore, the management letter cannot supersede the weakness report's legal position as some countries' regulations set it. Despite the suitable design and

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How Managers and Audit Committee Affect Internal Control Weakness implementation of controls, auditors try to explore maerial weaknesses in the design of controls and those tests performed concerning the control's not/running. This area's common methods include a questionnaire-based survey and other checklist methods, analysis flowcharts, observation-based documentation, system realization, and some documentary proceedings. Auditors attempt to deal with the material weaknesses affecting the effectiveness of control operation via the control test. The test is complete when the risk of exploration inability is at a low level. An appropriate risk model for internal auditing control will help the auditors determine the range of control operations' effectiveness (Brown and Lim, 2012).

Chen, Eshleman, and Soileau (2016) declared that it is less likely to find internal control weakness in companies where most board members are women. They showed that even a woman member could lower the possibility of internal control weakness. Chen et al. (2017) argued that companies with women board members are more likely to have an internal control weakness and suggested that the presence of women board members in small firms, regardless of whether they are in the audit committee or not, would lower the internal control weakness.

To monitor the management and participate in decision-making, the board of directors requires various skills, including accounting, banking, and regulation, to influence the increase of firm value. This issue's underlying hypothesis is that inexperienced members in accounting or financial knowledge cannot explore the current problems in financial reporting. Moreover, the presence of an experienced financial factor will cause other members to be sensitive and cognizant (Erickson et al., 2005).

Ahmad et al. (2015) carried out a study on the relationship between the board characteristics, risk management, and internal control disclosure among the listed Malaysian companies. The sample of this study includes 150 companies in the main Malaysian Stock Exchange Market in 2013. This study shows an appropriate level of disclosure among the companies mentioned in the Malaysian Stock Exchange. As declared in this study, the board characteristics contribute to the monitoring of risk. In addition, the board characteristics, like specialization, could higher the level of confidence of the internal control.

Given the facts mentioned above, research hypotheses are proposed as follows:

- **H1**. There is a negative and significant relationship between the board's level of education and internal control weakness.
- **H2**. There is a negative and significant relationship between the board members' financial expertise and internal control weakness.
- **H3**. There is a negative and significant relationship between the gender diversity of the board members and internal control weakness.
- **H4**. There is a negative and significant relationship between the board members' interlock and internal control weakness.
- **H5**. The board members' interlock contributes to the relationship between the board members' level of education and internal control weakness.

Lee (2016) conducted a study on the relationship between overconfidence of the CEO and the presence of internal control weaknesses (ICW), using a sample of 495 U.S companies during 2004-2011. The data obtained from internal control weaknesses and CEOs, based on the results of experimental analyses, showed that the CEO's overconfidence would positively affect the internal control weakness (ICW).

Lin et al. (2014) carried out a study on the effect of the board characteristics on the quality of internal control in the U.S, using a sample of 4.374 non-financial companies. Their obtained results revealed that, based on Section 404 of the Sarbanes-Oxley Act, CEO entrenchment and age have a significant relationship with the disclosure of internal control weakness. In general, results showed that the board characteristics are

highly probable to affect internal control mechanisms' power.

Given the facts above, research hypotheses are formulated as follows:

- **H6**. There is a negative and significant relationship between the CEO's level of education and internal control weakness.
- **H7**. There is a negative and significant relationship between the CEO's financial expertise and internal control weakness.

One of the most challenging issues is the presence of independent people in the audit committee. An independent manager is selected from outside the main company, satellite and dependent companies, and the firm's control shareholders. Irrespective of the criticisms expressed in action toward the concept of independence, the terms of being independent, etc., the study results are about the audit committee's independence, the fulfillment of those internal control objectives dominating the financial reporting, and the discrepancies and incompatibilities. The general supervisory board, the blue ribbon committee, the national association of public company managers, and Coopers believe that the audit committee's performance enjoys a high quality when the audit committee members are independent, enhancing the financial reporting credibility.

The corporate governance system is a concept introduced recently concerning accountability and the enhancement of information quality. The audit committee is considered as one of the major specialized committees of the board that causes the improvement, health, and quality of the financial reporting, the improvement of the internal control quality, auditors' performance, and will help the board be accountable, make sure that the operations of units are aligned with the rules and regulations, and prevent the illegal actions of the management. The audit committee should carry out its duties in an appropriate way. A transparent and written charter will help the committee and others understand the responsibilities. According to the audit committee charter passed on Dec. 2012 in Tehran Stock Exchange, an audit committee is constituted of 3-5 members, most independent and have a financial specialization, under the board's direct selection and appointment. The independence of the audit committee is the cornerstone of its effectiveness. The specialized committee is not yet that common in Iran. Still, since the Tehran Stock Exchange obliged the firms to do so, we hope to observe such committees' establishment and effective operation in all firms. Such monitoring, controlling, and strategic mechanisms would be influential when all its members have sufficient financial expertise and record. Such a committee will lead to more reliable data, and high-quality reports would be available to the management. The manager could provide better analyses and more concise predictions of each share's profit to the users (Jame'ei and Rostamian, 2016).

The audit committee's gatherings are where the committee and the board members share their information about firm performance, policies, and plans. The more the number of the meetings, the more successful the relations would be among managers and the board members (Erickson et al., 2005).

Within a study entitled, "the disclosure of material weakness in internal control: to what extent the gender of the audit committee members is important?" Parker et al. (2017) attempted to identify the factors related to disclosing material internal controls' weaknesses. According to gender studies in behavioral science, they realized that the audit committee's women members inspect the internal controls more accurately than what is performed by men. Thus firms with women members in the audit committee are more likely to report the material internal controls' problems.

Given the facts above, research hypotheses are formulated as follows:

- **H8**. There is a negative and significant relationship between the audit committee's financial expertise and internal control weakness.
  - **H9**. There is a negative and significant relationship between the audit committee's

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How Managers and Audit Committee Affect Internal Control Weakness independence and internal control weakness.

**H10**. There is a negative and significant relationship between the audit committee effort and internal control weakness.

#### 3. Research Methodology

In terms of objective, this paper is practical. Practical studies aim to develop practical knowledge throughout a specific area. Moreover, this study is descriptive in data collection (since it is about the status quo and lending a helping hand to the decision-making process) and correlational. The range of dependency of the dependent variable is studied in proportion to the independent one.

The duration of the study is from 2012 to 2016.

This study's realm is the listed companies on the Tehran Stock Exchange, and their non/financial data are used for calculating the research variables.

The statistical population of this study includes all listed companies on the Tehran Stock Exchange with the following qualifications:

- Their financial yearend should be at the end of March in each year to be able to use the data together and in a panel model, if required,
- The companies chosen should be affiliated with investment companies, financial intermediaries, holdings, banks, and insurances,
- The financial period should not be changed during the study, and;
- The data required should be completely presented during 2011-2016.

The sampling method is elimination. Companies with the above conditions would be selected. If the number of selected companies is high, a number of them would be omitted using the removal sampling.

#### 3.1. Data collection and analysis method

In this study, first, the library method and documentary studies are used for data collection, based on which the theoretical principles and the literature of the study were gathered from specialized Persian and English journals. Then, the required data for hypothesis testing were extracted via financial statements and descriptive notes of the selected companies, the board reports, CDs, video and statistical archive of the Tehran Stock Exchange, and Tehran Stock Exchange's website as Tadbir Pardaz and Rah Avaran-e Novin Software.

After confirming the accuracy, the collected data were transferred to Excel Software and prepared for the required analysis. The final data analysis was conducted using the EViews Econometric Software.

#### 3.2. Hypothesis testing model

Due to the growth of managers' understanding of internal controls' role in creating a competitive advantage and industrial development, several methods are proposed to test, measure, and evaluate internal controls. The models used in this study are as follows:

```
ICMW_{it} = \beta_0 + \beta_1 Board \ Education_{it} + \beta_2 Board \ Expertise_{it} + \beta_3 Board \ Gender_{it} + \beta_4 Board \ Interlock_{it} + \beta_5 Type \ Audit \ Rep + \beta_6 CEO \ Education_{it} + \beta_7 CEO \ Expertise_{it} + \beta_8 ACE_{it} + \beta_9 ACI_{it} + \beta_{10} ACE_{it} + \beta_{11} ACED_{it} + \beta_{12} Size_{it} + \beta_{13} \ LOSS_{it} + \varepsilon_{it}
```

Where the dependent, independent, and control variables are as follows:

*ICMW* it: weakness in the internal control structure, such that if the auditor reports a material weakness in the internal control, we assign one; otherwise, it would be 0.

Board Education it: the level of education of the board members; if at least one of the members of the board has a master's or Ph.D. degree, we assign 1; otherwise, it would

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be 0.

Board Expertise it: financial expertise of the board members; if a member of the board has an academic degree in the field of finance or accounting, we assign 1; otherwise, it would be 0.

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Board Gender it: gender diversity of the board members; if a board member is a woman, we assign 1; otherwise, it would be 0.

Board Interlocks it: the interlock of the board members, if at least a member of the board is affiliated with the board of another company, we assign 1; otherwise, it would

Type Audit Rep: type of audit report, if the report is acceptable, we assign 1; otherwise, it would be 0.

CEO Education it: the level of education of the CEO; if the CEO has a master's or Ph.D. degree, we assign 1; otherwise, it would be 0.

CEO Expertise it: financial expertise of the CEO; if the CEO has an academic degree, we assign 1; otherwise, it would be 0.

ACE it: Auditing Committee Expertise: The audit committee's financial expertise is calculated according to the proportion of audit committee members with professional accounting and auditing certificates to total audit committee members.

ACI it: Auditing Committee Independent: audit committee independence, achieved by the proportion of independent audit committee members to total audit committee members.

ACE01 it: Auditing Committee Effort: audit committee effort, which means the logarithm of the committee's number of sessions.

ACEL it: Auditing Committee Education: the level of education of the audit committee, if at least one of the audit committee members has masters or Ph.D. degree, we assign 1; otherwise, it would be 0.

Size it: the natural logarithm of sales is used in order to measure the firm size.

Loss it: if the company experiences loss, we assign 1; otherwise, it would be 0.

#### 3.3. The statistical method used for model estimation

The integrated data techniques are used in order to estimate the research models. Such data are the combination of two datasets, namely time series and cross-sectional. The integration of time series and cross-sectional data and the necessity of using them is mostly due to the increase in the number of observations, the increase of the degree of freedom, the decrease of variance heterogeneity, and the linearity among the variables. Moreover, such data determine those effects that cannot be simply observed in crosssectional and time-series data, more appropriately.

Given the data used as panel data, the third type of data are used in this study.

#### 3.4. Regression model estimation using the integrated data

The estimation of those relations in which the integrated data are used is not a simple task. In general, the following model indicates the integrated data:

$$Y_{it} = \beta_{1it} + \sum_{k=2}^{k} \beta_{kit} x_{kit} + e_{it}$$

 $Y_{it} = \beta_{1it} + \sum_{k=2}^{k} \beta_{kit} x_{kit} + e_{it}$ Where, i = 1, 2, ..., N is the cross-sectional units and t = 1, 2, ..., T refers to time. Yit is a dependent variable for ith cross-sectional unit in the year t and  $x_{kit}$  is also kth non-random independent variable for ith cross-sectional unit in the year t. It is hypothesized that the disrupted sentence of  $e_{it}$  has 0 mean of  $(E(e_{it}) = 0)$  and fixed variance of  $E(e_{it}^2) = \delta_e^2$ ).  $\beta_{kit}$  are passive parameters of the model that measure the dependent variable's reaction to the Kth independent variable changes in ith crosssection and tth time. In general, it is hypothesized that these coefficients are different for all cross-sectional and time units. Still, in most of the studies, the variation of these

How Managers and Audit Committee Affect Internal Control Weakness coefficients was also extremely for all sections and all times. Given the nature of the topic under study and other conditions, the author determines the appropriate hypotheses about the parameters.

#### 4. Results of descriptive statistics

We need to be acquainted with descriptive statistics of variables in order to assess the general and basic specifications of them for model estimation, accurate analysis, and for realizing the statistical population under study. Table 1 depicts a summary of the characteristics of descriptive statistics related to the variables used in this study. The reported statistics comprise indexes, and central criteria, including mean, median, and dispersion indexes, involving standard deviation, skewness, and kurtosis of the variables under study.

**Table 1.** The results of descriptive statistics of dependent, independent, and control variables

<b>Table 1.</b> The results of	descriptiv	ve statisti	cs of deper	ident, mde	pendent, a	iid Control	variables
Variable	Mean	Median	Skewness	Kurtosis	Standard deviation	Minimum	Maximum
Audit committee financial expertise ACE	0.469	0.666	1.446	-0.129	0.390	0.000	1.000
Audit committee effort ACE01	1.088	1.079	1.864	0.022	0.111	0.903	1.278
Audit committee educational level ACEL	0.223	0.000	2.760	1.326	0.416	0.000	1.000
Audit committee independence ACI	0.433	0.666	1.477	-0.219	0.353	0.000	1.000
The board educational level BOARD_EDUCATION	0.311	0.000	1.661	0.813	0.463	0.000	1.000
The board interlock BOARD_INTERLOCK	0.674	1.000	1.556	-0.746	0.468	0.000	1.000
The board financial expertise BOARD_EXPERTISE	0.302	0.000	1.742	0.861	0.459	0.000	1.000
The board gender diversity BOARD GENDER	0.050	0.000	17.99	4.122	0.218	0.000	1.000
CEO educational level CEO_EDUCATION	0.451	0.000	1.038	0.196	0.497	0.000	1.000
CEO financial expertise CEO_EXPERTISE	0.356	0.000	1.359	0.599	0.479	0.000	1.000
Internal control weakness factors ICMW	0.436	0.000	1.065	0.256	0.496	0.000	1.000
Firm loss LOSS	0.102	0.000	7.825	2.612	0.304	0.000	1.000
Firm size SIZE	6.137	6.081	4.068	0.612	0.626	4.415	8.316
Type of audit report TAR	0.571	1.000	1.084	-0.290	0.495	0.000	1.000

#### 4.1. Inferential statistics

Since in the present study the collected information is about 123 listed companies in Tehran Stock Exchange by using 13 variables to evaluate the effect of independent variables on dependent ones, the regression analysis is the most appropriate method of

hypothesis testing. As mentioned previously, this paper's data fitting model is based on the panel tests that, by using the statistical software of Eviews and the statistical tests of the mentioned model, it is possible to accept or reject the research hypotheses. The non-correlation of the residuals (errors) should be confirmed in the regression in order to be able to use the linear regression. Durbin-Watson Statistic is used to assess the independence of errors. In general, if the Durbin-Watson statistic is between 1.5 and 2.5, the hypothesis of non-correlation among model errors would be accepted.

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#### 4.2. Model selection tests

The F-Limer test is used to determine between two regression models with common sentences (regular) and regression with fixed effects that one is more appropriate. Provided that the F test's obtained probability confirms the null hypothesis, the regression with pooled effects would be employed. If the model with pooled effects is selected, we need another test to determine whether the model with pooled effects is suitable or the one with the random effects, for which the Hausman test is used. If this test's obtained probability confirms the null hypothesis, fixed effects should be used in the related regression model. If the null hypothesis is rejected, the random effect is more appropriate. The data of this study are classified as pooled in the classification of panel data. Lexically, pooled means a combination, and as can be seen in this class, all data are in equal condition and have equal behavior with each other.

**Table 2**. The results of model selection tests

	F-Limer test		Breusch-	Pagan test	Hausman			
Description	Statistic	Probability level	Statistic	Probability level	Statistic	Probability level	Result	
Research model	1.07	0.75	2.03	0.15			Integrated model	

#### 4.3. Correlation test

Durbin-Watson statistic is used in order for the non-correlation of the model. If the statistic is between 1.5 and 2.5, the null hypothesis, namely non-correlation among residuals, would be accepted; otherwise, H0 would be rejected, meaning a correlation among the residuals. Based on the statistic and its probability level of the related test, the null hypothesis concerning lack of correlation would be rejected. To deal with the autocorrelation problem, AR(1) entered into the model Durbin-Watson statistic of 2.317 is obtained. Since the resultant amount is between 1.5 and 2.5, there is no autocorrelation problem.

**Table 3.** The results of the correlation test

Test of autocorrelation						
Statistic	Probability level					
26.7	0.000					

#### 4.4. Variance homogeneity

According to the statistic and the probability level of the related test, the null hypothesis concerning variance homogeneity is rejected, so the GLS method deals with the variance homogeneity problem.

**Table 4.** The results of the variance homogeneity test

Test of variance homogeneity						
Statistic	Probability level					
321	0.000					

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#### 4.5. Testing the main research model

As can be seen in Table 5, the probability level indicates that the whole regression is significant with the value of 0.00, and this shows that the model is significant at a 95% level of confidence and also the  $R^2$  value shows that the changes of independent variables describe 0.78 of changes of the dependent variable.

**Table 5.** The results of the combined regression test of the research model

Model	LPM POOLED								
	Coefficient	Standard error	t statistic	Sig.					
Audit committee financial expertise (ACE)	-0.001	0.000	-2.056	0.040					
Audit committee effort (ACE01)	-0.000	0.002	-0.330	0.740					
Audit committee educational level (ACEL)	-0.000	0.000	-0.587	0.562					
Audit committee independence (ACI)	0.000	0.001	0.704	0.480					
The board educational level BOARD_EDUCATION	9.00E-05	0.000	0.308	0.761					
The board interlock BOARD_INTERLOCK	-0.000	0.000	-2.204	0.031					
The board financial expertise BOARD_EXPERTISE	-0.001	0.000	-4.310	0.000					
The board gender diversity BOARD_GENDER	-0.000	0.000	-2.120	0.030					
CEO educational level CEO_EDUCATION	-0.000	0.000	-1.907	0.061					
CEO financial expertise CEO_EXPERTISE	-3.51E-05	0.000	-0.233	0.820					
Firm loss (LOSS)	-0.000	0.000	-0.810	0.42					
Firm size (SIZE)	0.002	0.000	2.125	0.03					
Type of audit report (TAR)	-0.995	0.001	-572.0	0.00					
The board interlock and audit committee independence BOARD_INTERLOCK*ACI	-0.111	0.050	-2.209	0.02					
The board interlock and the board level of education BOARD_INTERLOCK*BOARD_ED UCATION	0.007	0.036	0.205	0.83					
The board interlock and audit committee effort	-0.019	0.048	-0.408	0.68					
C	0.984	0.006	154.4	0.00					
Dealing with the problem of autocorrelation - AR(1)	0.632	0.040	15.46	0.00					
$R^2$	0.78								
Durbin-Watson	2.317								
F statistic	213								
F statistic probability	0.000								

#### 4.6. Test of linearity

After the model fitting, we should talk about classic hypotheses. To make sure that there is no linearity in the model, a correlation was set 2 by 2 among the variables, and since all obtained values are under 0.8, there is no linearity problem. Moreover, the control variables' results also indicate a positive and significant relationship between the firm size (SIZE) and internal control weakness.

In addition, there is a positive and significant relationship between firm loss (LOSS) and internal control weakness.

	_	723								89		
TAR	-0.030	0.018723	0.037	0.030	-0.003	-0.062	0.014	0.035	-0.035	-0/05368	-0.031	-0 106
SIZE	0.005	0.05844	0.011	0.005	-0.070	600.0	0.093	0.001	600.0	0/054852	-0.079	-
$\mathbf{SSOT}$	-0.008	-0.04905	0.021	-0.010	-0.006	0.054	-0.048	-0.016	0.051	0/027144	1	-0 079
CEOEXPERTISE	-0.049	-0.10411	-0.019	-0.069	-0.042	-0.051	0.003	-0.015	-0.003	1	0.027	0.054
CEO_EDUCATION	0.014	-0.02416	-0.002	0.020	0.001	0.030	-0.062	0.041	1	-0/00381	0.051	600 0
BOARDGENDER	-0.011	-0.02894	0.010	-0.003	-0.033	0.000	0.024	1	0.041	-0/01537	-0.016	0 001
BOARDEXPERTISE	-0.063	0.066	0/015172	-0.083	-0.015	-0.015	1	0.024	-0.062	0/003264	-0.048	0.093
BOARD_INTERLOCK   BOARDEXPERTISE	-0.174	-0.04073	0.0809	-0.190	-0.001	1	-0.015	0.000	0.030	-0/05117	0.054	600 0
BOARD_EDUCATION	-0.018	-0.01649	0.039	0.043	1	-0.001	-0.015	-0.033	0.001	-0/04254	900'0-	020 0-
ACI	989.0	-0.03703	0.156	1	0.043	-0.190	-0.083	-0.003	0.020	-0/06982	-0.010	0.005
ACED	0.106	-0.03204	1	0.156	0.039	0.080	0.015	0.010	-0.002	-0/01902	0.021	0.011
ACE01	-0.035	1	-0.032	-0.037	-0.016	-0.040	990.0	-0.028	-0.024	-0/10411	-0.049	0.005
ACE	1	-0.03569	0.106	989.0	-0.018	-0.174	-0.063	0.0114	0.014	-0.04903	-0.008	0 005
	ACE	ACE01	ACED	ACI	BOARD_EDUCATION	BOARD INTERLOCK	BOARDEXPERTISE	BOARDGENDER	CEO_EDUCATION	CEOEXPERTISE	TOSS	SIZE

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#### 5. Conclusion

The last section of every scientific article is about the discussion and results of what was obtained from the proposed models and tests. This section aims to summarize the study and the results, which could lead to more coherence of each research study in terms of meaning and concept. Hence, first, we reflect on a summary of the previous sections and, given the hypotheses and analyses of section 4, will propose the summary of the results. Finally, we will discuss the suggestions and limitations of the study.

This study is concerned about the relationship between the audit committee's financial expertise, financial expertise of the board, the interlock of the board members, gender diversity of the board members, education level of the CEO, and type of audit report and internal control weaknesses. The present study results indicate a negative and significant relationship between the so-called variables and the internal control weaknesses.

As was expected, there is a significant relationship between the board, the CEO, and the audit committee and internal control weaknesses. This study's results are in line with Fama and Jensen (1983) and Lin et al. (2014). The results of hypotheses testing are indicative of a negative and significant relationship between some characteristics of the board, CEO, and audit committee, including education, financial specialization, and gender diversity of the board and internal control weakness, which seem plausible because, as expected by the increase of the level of education and more specialization of a field of studies for members and organizational departments, their approach to the issue of internal controls has become more specialized; consequently this would lower the internal control weakness. Further, the presence of gender diversity in the board will cause more sensitivities and concentrations on some organized issues, and many cases show that in a board with more gender diversity, compared with a board constituted of men, more important and sensitive issues are discussed, and this would reduce the fraudulent behaviors. These hypotheses indicate that the characteristics above contribute to the performance and management of internal control weakness. However, in contrast to the results, the hypothesis testing of the present study suggests that there is no negative and significant relationship between the level of education of the board, independence, level of education, the audit committee effort, and CEO expertise and internal control weakness, so these hypotheses are not confirmed. The results of this study confirm with that of Erickson et al. (2005) but in contrast to the results of Fama and Jensen (1983) and Lin et al. (2014). Given the number of gatherings of the audit committee, it is hypothesized that several meetings would help establish a relationship between managers and committee members. However, holding excessive sessions, in addition to the costs incurred, including time, the fee for participating in the committee sessions, may deviate the committee members from their operational and daily responsibilities. Hence, the audit committee should keep a balance between the costprofit of the sessions. In case the audit committee can sustain such a balance, depending on the firm setting, it would be capable of attracting economic interests for the firm; otherwise, the number of sessions and no positive effects in evaluations may make a loss to the firm. Moreover, this study shows that the board members' interlock could affect the relationship between audit committee independence and internal control weakness. Still, it does not affect the relationship between the audit committee's financial expertise and education level of the board members and internal control weakness.

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**Research Article** 

# The Relationship between Social Responsibility Disclosure and Cash Holdings

Naimeh Ghodsi Khamiri\*

Department of Accounting, Payame Noor University of Tehran. Tehran, Iran

#### **Abstract**

The present study investigates the relationship between social responsibility and cash holdings. The sample contains 770 firm years listed on the Tehran Stock Exchange from 2011 to 2017. The software used for statistical analysis is Stata 12, and the hypotheses were tested according to the multivariable linear regression test. The results suggest a negative and significant relationship between social responsibility and cash holdings. Furthermore, the results indicate that corporate governance negatively affects cash holdings. In addition, the results show the relationship between unsystematic risk and cash holdings is positive.

**Keywords**: Social Responsibility, Cash Holdings, Unsystematic Risk, Governance Score.

\*Corresponding Author: Department of Accounting, Email: naimeh.g.kh@gmail.com



#### 1. Introduction

Corporate social responsibility is related to the relationship between companies and society. More specifically, this concept is concerned with the impact of firm operations on people and society. Some critics believe that the concept of social responsibility allowed the executives to establish social obligations, optionally. Some others point to the financial scandals of major companies like Enron and WorldCom and declare that despite the corporate responsibility movement's development, such scandals show that firms and managers think about their own benefits.

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In fact, the world today considers the firms holistically, that is, a theoretical basis for novel approaches toward stakeholder theory-oriented firms. This theory states that companies become excessively large and contribute significantly to society so that more sections should be taken into account and shareholders. Corporate social responsibility clearly deals with a special set of business methods and strategies related to social issues. Still, according to many opinion leaders, the subject, far beyond what we think, is related to a philosophy or a set of values that form the basis of these methods. Investors ask for an amount of return on assets, which is equal to the related risk. Given the proposed explanations, the cash held is of great importance for firms. Now provided that these firms have regulated their social accountabilities, they could influence the cash holdings. Thus, the present study aims to evaluate the relationship between stock companies' social responsibility, cash holdings, unsystematic risk, and corporate governance.

#### 2. Literature Review and Hypotheses Development

Although the determining factors of liquid assets are discussed extensively in the literature, the relationship between corporate social responsibility (CSR) and liquid assets is not established so far. Some scholars argued that social responsibility might be considered a method. Business units collect the social (ethic) capital during the time (Godfrey, 2005; Aoki, 2007; Russo and Perini, 2010; Antoni and Sacconi, 2011). This is actually the case because by performing corporate social responsibility activities, the business firm could establish sound credit relationships between investors (nationally and internationally) and customers, staff, and suppliers and provide a robust social image among associations and law-makers.

 $H_1$ : There is a relationship between high social responsibility and cash holdings

Holding a considerable amount of cash in a firm could lead to management inefficiency due to easy access of controllers to these cash resources. More specifically, having access to the surplus cash of firm activities could escalate the risk of misusing this amount by controlling investors, who greatly influence firms' decisions (Boubaker et al., 2013). Due to agency problems, managers may not use firms' cash resources to increase their shareholders' value. Corporate governance mechanisms are currently one of the main factors for improving companies' resource management and economic efficiency, including a series of relations between firm management, the board of directors, shareholders, and other beneficiaries. Corporate governance mechanisms provide a regulatory structure for firm objectives and help the firm achieve its goals and monitor the performance.

Besides providing the necessary management motive, this system paves the way for effective monitoring to apply the resources more effectively. Therefore, cash holdings could cause a conflict of interest between managers and owners. Effective corporate

governance contributes significantly to the decline of the risk of inappropriate use of liquid assets and the decrease of the agency costs of cash holdings. Boubaker et al. (2013) analyzed the board's impact, including duality, independence, tenure, CEO influence, and board size on the cash holdings. Their obtained results indicate that the board characteristics have a direct impact on cash holdings. Harford et al. (2008) evaluated the relationship between cash holdings and corporate governance structure. They found that companies with more internal ownership and institutional ownership percentage hold more cash. In contrast, companies with higher quality and larger corporate governance, and more independent boards hold less cash. Moreover, Gord et al. (2014) showed a negative and significant relationship between institutional ownership, reliance on debt, and board independence, and the level of cash holdings. Moreover, according to the findings, there is no significant relationship between ownership concentration, CEO tenure, CEO duality, and cash holdings level.

 $H_2$ : There is a relationship between powerful corporate governance and cash holdings

Investors' willingness to invest in business firms with social responsibility and customer loyalty to these firms could alleviate the unsystematic risk. Investors who are willing to invest in business firms with social responsibility do not consider such a process as investment assets but classify such investments as consumable assets because they benefit from the deposits, not the incurred payments (Fama and French, 2007). Such an investment behavior creates a kind of inelasticity in the demand curve of firms' share with social responsibility. For example, investors may buy these kinds of stocks not only for their modified performance return through unsystematic risk or economic infrastructures but for their social responsibility performance. Similarly, more customer loyalty to business firms with social responsibility means that such firms have more stable demand (namely, lower price sensitivity). Their profit performance is less sensitive than economic changes. Therefore, since firms with more unsystematic risks are more inclined toward more cash holding (Cheung, 2016), Luo and Batachariya (2009) argue that the social responsibility of a firm could reduce the specific risk in that business firms with a higher level of social capital are expected to be more capable in absorbing fluctuation (internally and externally). In particular, a sound relation among investors would lead to supply and demand consolidation during the critical periods, the increase of flexibility against fluctuations, and partnership in the increase of sustainable growth for business firms.

There is a positive relationship between unsystematic risk and cash holdings of business firms because the precautionary action for cash holdings surges when the risk of business firms' cash flows increases (Bates et al., 2009). Gao and Grinstein (2014) discovered that managers hold cash for precautionary purposes (with preventive aim). In addition, Mikkelson and Partch (2003) concluded that regular holding of considerable cash could result in poor performance, which is indicative of the conflict of interest between managers and shareholders. They declared that investors should be concerned about the managers not to draw from the internal cash reservoirs, and companies with copious amounts of cash holdings could audit other companies and reduce their values with higher probability.

 $H_3$ : There is a relationship between unsystematic risk and cash holdings

However, corporate governance may have a negative relationship with social responsibility. The agency theory indicates that since managers are willing to create

cash (Jensen, 1986) and participate in liquid assets activities to pursue their resources (Surroca Kavteripo, 2008; Jiraporn and Chintrakam, 2013; Fabrizi et al. 2014), the activities of social responsibility and liquid assets have a positive correlation. However, initial studies on this topic show that agency costs are not directly observable. The moderating role of corporate governance, which could debilitate the management strength or other types of agency costs, is taken for granted.

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Recent studies generally confirm corporate governance's role and document that corporate governance has a negative relationship with liquid assets because they decrease agency problems related to liquid assets (Dittmar et al., 2007; Yun, 2009). In case the manager is willing to hold free cash flows and pursue social responsibility activities, we expect the level of liquid assets and range of partnership in social responsibility activities to be less for business firms with appropriate corporate governance. Accordingly, robust corporate governance could lead to a high (low) social responsibility. Secondly, Beltratti (2005) stated a positive relationship between social responsibility and corporate governance because they have a complementary role in forming the objectives and ongoing business firms' limitations. Thirdly, managers of firms with strong corporate governance may benefit from the investors' relations as an effective strategy, which shows that powerful corporate governance has a relationship with high social responsibility (Cespa, and Cestone and Soro Kavteripo, 2007; Fabrizi et al., 2014).

 $H_4$ : Powerful corporate governance contributes to the relationship between high social responsibility and cash holdings

Investors' willingness to invest in business firms with social responsibility (CRS) and customers' loyalty to business firms with CRS could lessen the unsystematic risk. Investors who are willing to invest in business firms with social responsibility do not consider such a process as an investment asset but classify such investments as consumable assets because they benefit from the deposits, not the incurred payments (Fama and French, 2007).

There are two competing approaches to the relationship between unsystematic risk and liquid assets. The first one is that lower unsystematic risk could decrease the liquid assets in that it reduces the required motive for transacting the cash held (Palazzo, 2012; Acharya et al., 2013). Palazzo (2012) showed that firms with low correlation and fluctuations, when they need external financial supply, are less likely to experience the shortage of cash flows, so it is expected that they have fewer immunization needs and hold less cash. In sum, firms with CRS are inclined to lower the unsystematic risk, which reduces their needs for cash holdings. The second approach is that a lower unsystematic risk may lead to higher liquid asset levels due to refinancing risk. Harford et al. (2014) argue that firms with shorter due date structures are more likely to face refinancing risk. In order to lower the risk, they are willing to increase their liquid assets. In other words, liquid assets are of great importance in reducing the risk of refinancing firms with short-time debts.

 $H_5$ : Unsystematic risk contributes to the relationship between high social responsibility and cash holdings

The Relationship between Social Responsibility Disclosure and Cash Holdings

#### 3. Research Methodology

The statistical population comprises all listed companies on the Tehran Stock Exchange from 2011 to 2017, and the companies with the following qualifications are selected as the sample of the study:

1. Data of companies should be available during the course of study. 2. Companies should not be affiliated with insurance companies and financial intermediaries. 3. To increase the comparability, their financial yearend should be on March 20<sup>th</sup>. 4. Companies should not change their fiscal year during the course of study. Given the imposed limitations, a total of 110 companies was selected as the sample of the study.

#### 3.1. Research models

Consistent with the five hypotheses in this paper, the following five models are used to test hypotheses:

```
Cash = \beta_0 + \beta_1 csr + \beta_2 mtb + \beta_3 size + \beta_4 lev + \mathcal{E}_{it}
Cash = \beta_0 + \beta_1 csr + \beta_2 mtb + \beta_3 size + \beta_4 lev + \mathcal{E}_{it}
Cash = \beta_0 + \beta_1 csr + \beta_2 mtb + \beta_3 size + \beta_4 lev + \mathcal{E}_{it}
Cash = \beta_0 + \beta_1 cg + \beta_2 csr + \beta_2 csr * cg + \beta_3 mtb + \beta_4 size + \beta_5 lev + \mathcal{E}_{it}
Cash = \beta_0 + \beta_1 idio + \beta_2 csr + \beta_2 csr * idio + \beta_3 mtb + \beta_4 size + \beta_5 lev + \mathcal{E}_{it}
```

Where  $\beta_0$  is the intercept, cash is cash holdings of the company i in the year t, csr it is the high social responsibility of firm during the year, Lev is the financial leverage i in the year t, size it is the firm size of firm i in the year t, mtb it is the growth opportunity for the company i in the year t, cg it is powerful corporate governance i in the year t, idio it is an unsystematic risk i in the year t.

## 3.2. The operational definition of the research variables and their measurement process

**3.2.1. Dependent variable:** cash holdings is the dependent variable, which is achieved by dividing the cash into total assets.

#### 3.2.2. Independent variables

Unsystematic risk: is achieved through the error sentence of the Fama and French model. Fama and French proposed the three-agent model of  $\beta$ , size, and book value to market value ratio, given their findings in 1992 using the CAMP model and the previous studies. They designed a multivariable regression for evaluating the effective factors on portfolio return (Fama and French, 1993). Using the CAMP model. Fama and French proposed the following formula:

$$R_i - R_{f=} a_{i+} b_1 (R_m - R_f)_+ b_2 (SMB) + b_3 (HML)$$

Ri-Rf is the company's additional return to no-risk return; this additional return is related to three agents of spending market risk, size factor, and value.

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**Table 1.** Measuring the corporate governance score

Agent		Operational definition
Board effectiveness	BOARD	Less proportion of unbounded members to total members from the calculated amount for all companies of a year takes the value of 0; otherwise, it is 1.  Not separating the role of CEO from the board of directors takes the value of 0; otherwise, it is 1.  Change of CEO during the last two years takes 0; otherwise, it is 1.
Governance structure	GOV	Not changing the signing partners of audit reports within the last two years takes 0; otherwise, it is 1.  Lack of internal audit department takes the value of 0; otherwise, it is 1.  If audit firms perform the audit, it is 0, and if an audit organization performs it, it would be 1.
Ownership effects	OW	Freer float stock of a firm than the mean of total free float stock takes the value of 0; otherwise, it is 1.  If the institutional shareholders possess more than 5% of a firm's regular stocks, it takes the value of 0; otherwise, it is 1.
Transparency	DIS	More proportion of interaction with sales affiliated individuals from the total mean of companies takes 0; otherwise, it is 1.  The presence of net tax annual adjustments takes the value of 0; otherwise, it is 1.  The presence of unacceptable statements takes the value of 0; otherwise, it is 1.  Lack of a website takes the value of 0; otherwise, it is 1.

#### 3.2.3. Corporate governance score

For calculating each firm's corporate governance score, the first total corporate governance score of all firms, the total mean score is calculated. If the corporate governance scores of the company i in the year t is more than the total mean score, it takes 1; otherwise, it would be 0. To measure the corporate governance score of companies under study, we first define 12 components (with the same coefficient) based on 4 indexes (with the same coefficient) for the corporate governance, then defined each component, assign the 0 and 1 value to each company under study. These components are selected by concluding the conducted studies on this subject.

#### 3.2.4. Social responsibility reporting (CSR):

According to Mishra et al. (2011), the following model, which is objective and slightly popular, is used to measure corporate social responsibility:

$$CSR-s = CSR-COM-S + CSR-EMP-S + CSR-ENV-S + CSR-PRO-S$$

*CSR-S* is the social responsibility score. In this paper, four criteria of partnership disclosure score, staff relation disclosure score, environmental disclosure score, and product feature disclosure score were used to calculate the social responsibility score.

CSR-COM-S is a social partnership disclosure score calculated from the difference between strong points and weak points. The partnership disclosure score for stock companies, given the study of Mishra et al. (2011), who declared that companies that pay no tax or the liquidation of the company have a negative effect on the economic status of the society, is considered as a weak point and charity and innovative actions are the positive points. Hence, the social partnership score is calculated by subtracting the strong points from the weak points.

 $CSR\text{-}COM\text{-}S = \Sigma Strengths - \Sigma Concerns$ 

Similarly, we can calculate the scores of other aspects of social responsibility, like:

CSR-EMP-S: staff relation disclosure score.

The staff relation score is calculated by subtracting the strong points from the weak points as follows: staff relation score for stock companies given the study of Mishra et al. (2011) who declared that sanitary and security weaknesses, downsizing of the

The Relationship between Social Responsibility Disclosure and Cash Holdings workforce, and incurring no payment and benefits and weakness in retirement benefits are the weak points and sharing cash benefit, retirement benefits, cash (granting loans, etc.) and non-cash grants, accepting the suggestions of staffs, regulating work environment health, regulating safety points, promoting welfare affairs in the workshop (well-equipped dormitory, transport), welfare actions (recreational settings), training staffs and rewarding to increase the production are the strong points. Hence, the staff relation score is calculated by subtracting these strong points from the said weak points.

CSR-ENV-S: environmental disclosure score.

The environmental disclosure score is calculated by subtracting the strong points from the weak points as follows: the environmental disclosure score for stock companies given the study of Mishra et al. (2011) who declared companies that have hazardous waste and also fined for weak management about waste materials and air pollution as well as for the use of chemicals for reducing the Ozone layer is the weak points and clean energy (use of fuel with less pollution), controlling the air pollution and reducing the greenhouse gas, gaining reward or Green commitment certificate, development of green space in the workplace, principled disposal of waste (waste management), the optimization of energy consumption, fostering the environmental and manufacturing culture per the environment are the strong points. Hence, the environmental disclosure score is calculated by subtracting these strong points from the weak points.

*CSR-PRO-S*: product feature disclosure score, which is calculated via the above-said model.

The product feature disclosure score is calculated by subtracting the strong points from the weak points as follows: the product feature disclosure score for stock companies given the study of Mishra et al. (2011) declared that companies that are fined for product safety and negative advertisements and also for the complaint of customer due to dissatisfaction of product quality are weak points and in case the company has high quality and safe products, conduct research and development processes, and carry advertisement and marketing and have after-sale services are strong points. Hence, the environmental disclosure score is calculated by subtracting the strong points from the weak points.

#### 3.2.5. Moderator variables:

In this paper, corporate governance score and unsystematic risk are two moderator variables.

#### 3.2.6. Control variables:

**Firm size:** the natural logarithm of the book value of total assets is used to measure the firm size.

**Financial leverage:** total debt to total assets ratio is used to measure the financial leverage.

**Growth opportunity:** market value of equity to book value of equity ratio is used as an agent for firm growth.

#### 4. Hypotheses Testing

Descriptive statistics of the study: descriptive methods aim to describe the data using the tables and descriptive statistics tools, including central and dispersion indexes, to clarify the subject of study. The following table contains the descriptive statistics of all applied variables of the study. The number of reliable observations for each variable is 7 years. The desired data for 110 listed companies in the Tehran Stock Exchange were prepared. In the first section, the most important central and dispersion indexes were proposed. The standard deviation was used among the central indexes, mean i, and dispersion indexes. In addition, a minimum and maximum were introduced for each

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variable. Mean is the main central index used, the value of which is exactly at the equilibrium point or the center of gravity, and finally, the standard deviation is the major parameter of dispersion, which is achieved from the square root of the variance. These indexes are proposed in Table 2, and the values of this table are calculated via Stata, Excel version 12.

**Table 2.** Descriptive statistics

Tubic 2. Bescriptive statistics								
Variable	Symbol	Minimum	Maximum	Mean	Standard deviation			
Cash holdings	Cash	0.06	0.219	0.091	0.1			
Unsystematic risk	idio	0.014	0.58	0.13	0.24			
Systematic risk	beta	0.08	0.69	0.211	0.252			
Social responsibility	csr	0	1	0.319	0.156			
Corporate governance score	cg	0	1	0.240	0.413			
Firm size	size	-0.19	0.89	0.21	0.24			
Financial leverage	Lev	0.26	0.87	0.51	0.31			
Growth opportunity	mtb	0.89	6.54	2.36	0.47			

# 4.1. Testing the first hypothesis

The results of Table 3 indicate that the model is optimum for hypothesis testing. The f statistic (52.33) and the significance level (0.0000) document the model is significant. The results of the Wooldridge Test indicate that there is no autocorrelation among disturbance sentences. The adjusted coefficient of determination is 0.35. High social responsibility is considered the independent variable, cash holdings as the dependent variable, firm size, growth opportunity, and financial leverage are the study's control variables. The variable of high social responsibility, given its level of significance (0.0000) in Table 3, has a negative and inverse relationship with cash holdings. There is a negative and significant relationship between the control variables of firm size, growth opportunity, and financial leverage, and cash holdings. Since there is a relationship between high social responsibility and cash holdings, the first hypothesis is accepted.

**Table 3.** Testing the first hypothesis

Variable	Symbol	Coefficient	T statistic	P-value
Social responsibility	csr	-0.15	-4.63	0.000
Growth opportunity	mtb	0.08	-2.25	0.034
Firm size	size	-0.03	-4.05	0.000
Financial leverage	lev	-0.41	-3.22	0.000
Intercept		0.22	1.04	0.251
$\mathbb{R}^2$		0.36	F statistic	52.33
Durbin-Watson		2.143	r statistic	32.33
adjusted R <sup>2</sup>		0.35	Level of significance	0.000

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## 4.2. Testing the second hypothesis

The results of Table 4 indicate that the model is optimum for hypothesis testing. The f statistic (69.12) and the significance level (0.0000) document the model is significant. The results of the Wooldridge Test indicate that there is no autocorrelation among disturbance sentences. The adjusted coefficient of determination is 0.34. Powerful corporate governance is considered the independent variable, cash holdings as the dependent variable, firm size, growth opportunity, and financial leverage are the study's control variables. The variable of powerful corporate governance, given its level of significance (0.0000) in Table 4, has a negative and inverse relationship with cash holdings. There is a negative and significant relationship between the control variables of firm size, growth opportunity, and financial leverage, and cash holdings. Since there is a relationship between powerful corporate governance and cash holdings, the second hypothesis is accepted.

The Relationship between Social Responsibility Disclosure and Cash Holdings **Table 4.** Testing the second hypothesis

Variable	Symbol	Coefficient	T statistic	P-value
Powerful corporate	00	-0.103	-4.02	0.000
governance	cg	-0.103	-4.02	0.000
Growth opportunity	mtb	0.35	7.52	0.000
Firm size	size	-0.28	-3.96	0.000
Financial leverage	lev	-0.063	-2.41	0.026
Intercept		0.231	1.52	0.087
$\mathbb{R}^2$		0.35	F	60.10
Durbin-Watson		2.23	F statistic	69.12
adjusted R <sup>2</sup>		.034	Level of significance	0.000

# 4.3. Testing the third hypothesis

The results of Table 5 indicate that the model is optimum for hypothesis testing. The f statistic (55.74) and the significance level (0.0000) document the model is significant. The results of the Wooldridge Test indicate that there is no autocorrelation among disturbance sentences. The adjusted coefficient of determination is 0.31. Unsystematic risk is considered the independent variable, cash holdings as the dependent variable, firm size, growth opportunity, and financial leverage are the study's control variables. The variable of powerful corporate governance, given its level of significance (0.031) in table 5, has a positive and direct relationship with cash holdings. There is a significant relationship between the control variables of firm size, growth opportunity, and financial leverage, and cash holdings. Since there is a relationship between unsystematic risk and cash holdings, the third hypothesis is accepted.

**Table 5.** Testing the third hypothesis

Variable	Symbol	Coefficient	T statistic	P-value
Unsystematic risk	idio	0.04	2.37	0.031
Growth opportunity	mtb	0.42	4.55	0.000
Firm size	size	-0.37	-2.52	0.000
Financial leverage	lev	-0.078	-1.77	0.035
Intercept		0.145	1.13	0.064
$\mathbb{R}^2$		0.33	F statistic	55.74
Durbin-Watson		2.18	1 statistic	33.74
adjusted R <sup>2</sup>		0.31	Level of significance	0.000

## 4.4. Testing the fourth hypothesis

The results of Table 6 indicate that the model is optimum for hypothesis testing. The f statistic (67.52) and the significance level (0.0000) document the model is significant. The results of the Wooldridge Test indicate that there is no autocorrelation among disturbance sentences. The adjusted coefficient of determination is 0.34. High social responsibility is considered the independent variable, cash holdings as the dependent variable, powerful corporate governance as the moderator variable, firm size, growth opportunity, and financial leverage are the study's control variables. The variable high social responsibility in powerful corporate governance, given its level of significance (0.000) in table 6, has a negative and inverse relationship with cash holdings. There is a significant relationship between the control variables of firm size, growth opportunity, and financial leverage, and cash holdings. Since powerful corporate governance contributes to the relationship between high social responsibility and cash holdings, the fourth hypothesis is accepted.

**Table 6.** Testing the fourth hypothesis

Variable	Symbol	Coefficient	T statistic	P-value
Social responsibility	csr	-0.19	-3.55	0.000
Powerful corporate	0.0	-0.178	-4.46	0.000
governance	cg	-0.178	-4.40	0.000
Powerful corporate				
governance* social	Csr* cg	-0.25	-3.24	0.000
responsibility				
Growth opportunity	mtb	0.32	4.17	0.000
Firm size	size	-0.67	-2.12	0.000
Financial leverage	lev	-0.047	-1.45	0.027
Intercept		0.185	1.48	0.09
$\mathbb{R}^2$		0.36	F statistic	67.52
Durbin-Watson		2.14	r statistic	07.52
adjusted R <sup>2</sup>		0.34	Level of significance	0.000

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### 4.5. Testing the fifth hypothesis

The results of Table 7 indicate that the model is optimum for hypothesis testing. The f statistic (55.45) and the significance level (0.0000) document the model is significant. The results of the Wooldridge Test indicate that there is no autocorrelation among disturbance sentences. The adjusted coefficient of determination is 0.30. High social responsibility is considered the independent variable, cash holdings as the dependent variable, unsystematic risk as to the moderator variable, firm size, growth opportunity, and financial leverage are the study's control variables. The variable high social responsibility, given its significance level (0.000) in table 7, has a negative and inverse relationship with cash holdings. High social responsibility in unsystematic risk, given its level of significance (0.041) in Table 7, has a positive and direct relationship with cash holdings. There is a significant relationship between the control variables of firm size, growth opportunity, and financial leverage, and cash holdings. Since the unsystematic risk contributes to the relationship between high social responsibility and cash holdings, the fifth hypothesis is accepted.

**Table 7.** Testing the fifth hypothesis

Variable	Symbol	Coefficient	T statistic	P-value
Social responsibility	csr	-0.24	-4.17	0.000
Unsystematic risk	idio	0.07	2.65	0.024
Powerful corporate governance* social responsibility	Csr* idio	0.09	1.14	0.041
Growth opportunity	mtb	0.38	3.15	0.000
Firm size	size	-0.49	-2.38	0.000
Financial leverage	lev	-0.087	-2.35	0.041
Intercept		0.195	2.22	0.062
$\mathbb{R}^2$		0.31	F statistic	55.45
Durbin-Watson		2.41	r statistic	33.43
adjusted R <sup>2</sup>		0.30	Level of significance	0.000

### 5. Conclusion

The results showed that firms with higher social responsibility and higher environmental performance are less willing to hold cash. This shows that by doing activities related to social responsibility, firms would establish and maintain harmonious relationships among investors, in the form of credit among investors and customers, trust among staff and suppliers, and the growth of social responsibility among associations law-makers. According to Chiang (2015), companies with high social responsibility are more willing to hold less cash, which is in line with this hypothesis.

As for the significant relationship between powerful corporate governance and cash

holdings, we mean the more the power of corporate governance in stock companies, the less is the amount of cash holdings. However, in some studies, like Jensen (1986), corporate governance may negatively affect cash holdings. Recent studies indicated that corporate governance has a negative relationship with cash holdings because in the agency theory, to decrease the agency problems related to cash holdings, less cash is maintained to prevent the misuse or earnings management of managers (Dittmar et al., 2007; Yun, 2009; Chen et al., 2012). Suppose the manager is willing to hold free cash flows. In that case, it is expected that the level of cash and the range of partnership in social responsibility activities be less in firms with an appropriate level of corporate governance. As for the significant relationship between unsystematic risk and cash holdings, namely, the higher the unsystematic risk in stock companies, the higher is the cash holdings. Unsystematic risk has a positive relationship with the cash of business firms. This is due to the precautionary action for holding liquid assets when a firm's risk increases (Bates et al., 2009). According to Chiang, firms with unsystematic risk have fewer cash holdings, which is in line with this hypothesis.

As for the impact of powerful corporate governance on the relationship between high social responsibility and cash holdings, we mean the higher the social responsibility of stock companies, the less is the cash holdings. Since powerful corporate governance takes the moderating role in high social responsibility, it has a more negative impact on cash holdings, so powerful corporate governance has a negative effect on the relationship between high social responsibility and cash holdings and makes this relationship more negative. Furthermore, we could say that social responsibility has a positive relationship with corporate governance due to the following reasons. First, we could mention the framework used extensively (environmentally, socially, and corporate governance), comprises the corporate governance as one of the structural components, and the international association of investors uses it to evaluate a firm's investments with social responsibility. Hence, powerful (weak) corporate governance would lead to high (low) social responsibility. Second, according to Beltovati (2005), a firm's social responsibility and corporate governance have a positive relationship because they complement each other in forming the objectives and limitations of business firms. Third, firm managers with powerful corporate governance may establish a relationship with investors as an effective strategy, which shows that powerful corporate governance is related to high social responsibility (Cespa and Cestone; Soro Kavteripo, 2007; Fabrizi et al., 2014). Thus, in stock companies with powerful corporate governance and high social responsibility, cash holdings are low, and powerful corporate governance contributes to the relationship between high social responsibility and cash holdings, which is in line with this hypothesis. As for the impact of unsystematic risk on the relationship between high social responsibility and cash holdings, we mean the more the social responsibility of stock companies, the less is the cash holdings. Since the unsystematic risk takes a moderating role in high social responsibility, it positively affects cash holdings, so the unsystematic risk positively impacts the relationship between high social responsibility and cash holding and makes the relationship more positive.

According to Fama and French (2007), we could conclude that investors' willingness to invest in firms with higher social responsibility is more and the loyalty of customers to firms with higher social responsibility and their willingness for investment could reduce the unsystematic risk. Investors interested in firm investment with social responsibility do not consider such that as capital assets but classify them as consumable assets because they benefit from the maintenance of such assets. Such an investment behavior creates a kind of inelasticity in the demand curve of firms' shares

with social responsibility. Moreover, the lower unsystematic risk could reduce the cash holdings because it decreases the cash held transaction motive (Acharya et al., 2013). Palazzo (2012) indicated that firms with lower correlation and fluctuations, when requiring external financial supply, are less likely to experience a cash-flow shortage, so it is expected that they have fewer immunization demands and hold less cash. According to Acharya et al. (2013), the unsystematic risk could affect cash selection and bank loans. Since banks cannot secure the cash for all business firms every time, business firms with lower unsystematic risk can grant credit, so we could conclude that the cash holdings are lower in companies with higher unsystematic risk. Therefore, companies with higher social responsibility and higher environmental performance are more interested in lower systematic risk and more cash holdings. Since in stock companies, the systematic risk is lower, it may lead to the growth of cash holdings due to the risk of financial supply.

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Research Article

# The Effect of Earning and Information Quality on Stock Trading

Abdorreza Asadi, Ahmad Zendehdel, Bibi Zahra Sanagostar

Department of Management, Neyshabur Branch, Islamic Azad University, Neyshabur, Iran

# **Abstract**

This study investigates the effect of earnings and information quality on stock trading. The statistical population consists of 99 listed companies in Tehran Stock Exchange from 2013 to 2018. To test the hypotheses, multiple regression analysis of panel and pool data structure is used. The results show that the earnings persistence, earnings response coefficient, and accruals quality significantly affect the trading days' ratio. Furthermore, it reveals an insignificant relationship between the annual stock return and trading days' ratio. The results further reveal that the effect of earnings persistence and quality of accruals on stock trading turnover is similarly insignificant. Simultaneously, the earnings response coefficient and annual stock return significantly affect the stock trading turnover.

**Keywords:** Earnings Persistence, Earning Response Coefficient, Quality of Accruals, Stock Trading.

\*Corresponding Author: Associate Professor of Accounting, Email: Abdorrezaasadi@yahoo.com



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# 1. Introduction

Financial reporting and accounting systems have a vital and critical role in providing the information needed for investors' decision-making and, consequently, in capital markets' proper functioning. That is why supplying the investors' information needs can be regarded as one of the main financial reporting objectives. Information resulting from the accounting system helps investors evaluate the company's future performance and its related risks; therefore, such information is useful for valuing companies. However, the quality of the presented information is of essential importance. So, the information in terms of decision-making is considered useful that contains special features, including relevance, reliability, etc. (Dianati et al., 2013).

Financial reporting quality can be defined as financial statements' ability to convey the company's operations' information, especially forecasting expected cash flows to investors (Modarres and Hesarzadeh, 2009). The timeliness of financial reports is an important part of the quality of presenting financial information of companies; because it is the timeliness of the information that can lead to the better and more practical use of information by users, and finally, it results in transmitting the final product to the accounting system. Therefore, reporting speed with the meaning of delay in the presentation of companies' financial reports should be greatly considered by the financial reports' preparers. Increasing the reporting speed due to the timely reporting of data in making economic decisions by investors can lead to greater transparency of financial information and, consequently, to higher transparency of the capital market. This, in turn, could have a major impact on the attractiveness of financial and capital markets.

Since financial reporting is a reliable and credible tool that is publicly available, in case of being timeliness, it can decrease the risk of adverse selection by investors by reducing private and confidential information. It can be assumed that providing more timely information will result in reducing information asymmetry among investors (Mahdavi and Jamalianpour, 2011); as a result, it would have great help in gaining the confidence of investors and market participants that in return will increase the volume of transactions and reduce the cost of capital and ultimately will have more liquidity.

# 2. Literature Review and Hypotheses Development

The role of information in the decision-making process is clear. Economic decisions require information that can be used to allocate the available resources in the best way possible. One way of achieving this information tends to be using data from the annual financial statements. Financial statements that are comprehensive and widely used are the best way to provide financial information to its users. General-purpose of financial statements is the needs of consumers, including investors. Actual and potential investors are mainly interested in the evaluation of a company's investment properties. An investment's characteristics involve risk, efficiency, dividend, the security of investment, liquidity, and growth (Yahyazadehfar and Ahmadpour, 2003). Qualitative characteristics of financial information refer to the characteristics of information that lead to its usefulness. For the data to be perceived qualitative, they should have a series of qualitative characteristics. These features make the information provided in financial statements useful for users (Etemadi et al., 2010). One of the fundamental prerequisites for gaining the investor's and creditors' confidence in economically productive activities is providing and presenting information useful in making economic decisions. Since financial decisions should be made based on the risk and return, giving attention to a specified risk and performance level becomes important. One of the factors affecting the risk refers to the liquidity of the stock. Following this, the level of stock liquidity affects

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the investors' decisions informing the portfolio of investment. To put it differently, rational investors demand a higher risk premium for shares with less liquidity and higher expected return rates (Sheykh and Safarpour, 2008).

Accounting and financial reporting quality is the joint product of at least four main factors: creativity and approaches to management, audit quality, audit committee experience, and high-quality accounting standards. The existence of weakness in each of the four rings can harm the entire chain. The more important factors involve the criteria, variables, and measures that assess information accounting quality.

Earnings persistence evaluates the continuity and persistence of earnings from one period to the next. High earnings persistence is considered a feature of high-quality accounting. The earnings response coefficient measures the abnormal market return in response to the company's least expected reported profit. According to the investors, the quality of accruals means the proximity of accounting profit to cash. Thus, poor quality of accruals leads to increased uncertainty and, consequently, investment risk seeks to rise (Saghafi and Ebrahimi, 2010).

Financial markets witnessed two types of reaction in response to information: The first reaction refers to the effects of price information on securities. Most accounting studies examined this reaction in response to accounting data. Such an effect is visible in liquidity indicators, and so far, less attention has been devoted to them by accounting researchers (Chung et al., 2009).

Liquidity is one of the concerns of those who buy or sell their shares or manage trading infrastructures. An important indicator in assessing the market situation tends to be liquidity in its securities. High levels of liquidity in the stock reflect its success in the transparency of the information, and the securities' close price to their intrinsic value (Saeedi and Dadar, 2011). Perhaps the investors in the most famous and big stock exchanges do not worry over the liquidity of its shares as investors in TSE because TSE due to the lack of mechanisms in providing liquidity such as the market performance, the big difference in the disparity of buying and selling prices, and information asymmetry is placed among the non-cash stock exchange in the world.

The liquidity of a stock sheet refers to its possibility of fast selling. If a share can be sold faster and at a lower cost, it could be stated that such a share would be known as a share of high liquidity. Securities that are frequently trading daily than securities trading with a limited or low frequency have greater liquidity and lower risk (Yahyazadehfar et al., 2011).

Information and motivational issues prevent the efficient allocation of resources in the capital markets. Disclosure of information and solutions to improve public credit between managers and investors play an important role in reducing these problems. One of the most important economic challenges is the allocation of savings to the investment of opportunities. While the companies and savers are willing to trade with each other, the allocation of savings to investment opportunities is complicated for two reasons. Firstly, managers often have more information than savers regarding their value of investment opportunities. In addition, they are more inclined to exaggerate the value of their own company. In this case, savers, after investigating this company, face the problem of information. Secondly, the investee company may seek to abuse the investors' rights that will lead to agency problems (Healy and Palepu, 2001). Due to different factors affecting the stock market, including the recent financial crisis and the capital market's weak performance, market liquidity faced turbulent times. Due to the sudden surge and drop in prices, the stock liquidity is very high in some years and periods, and it is too low in others. Upon receiving good news about the country's political and economic issues, liquidity increases, and by getting upsetting news, we face liquidity shortages and decrease. In such a financial market, investors are looking

for more investment in the private companies out of stock with seemingly high returns and alternative markets such as gold, real estate, and currency; in this regard, TSE has been seriously hurt.

Salavi (2011) aimed to investigate the relationship between stock liquidity and the quality of financial information. In this study, the impact of earnings per share is discussed as measuring financial information quality. The findings indicated a positive relationship between the quality of information and stock liquidity.

Jeffrey (2011) studied the sensitivity of stock returns to unexpected changes in the cash market. The findings of his study revealed that a high quality of data reduces liquidity risk. In addition, when changes in market liquidity are great, there is a negative relationship between the quality of information and stock liquidity risk.

In a study, Bardos (2011) examined the relationship between the quality of information and liquidity. He specifically investigated the relationship between restated financial statements and liquidity. The results showed that to renew the presentations associated with a reduction in earnings quality, the lack of liquidity related to several months before increases by announced restatements and a year after the restatement remains at a high level.

Bhattacharya et al. (2008) aimed to study the relationship between the quality of benefit and stock liquidity of New York Stock Exchange and NASDAQ stock market in the period 1998-2005, and they concluded that low quality of earnings increases the information asymmetry and, thus, reduce the liquidity of the stock.

Foroughi and Ghajavand (2013) studied the effect of information quality on TSE companies' stock liquidity. Two variables, including the quality of accruals and forecast accuracy of earnings per share, were used to determine the quality of information. To measure the forecast accuracy of earnings per share, the random walk model came into use. To calculate the quality of accruals, a model developed by Francis et al. (2005) was applied. In this research, 104 companies listed in TSE in the period 2002-2011 were studied. To test the hypotheses, multivariate regression models were used. It was concluded that there was a positive relationship between the quality of accruals and stock liquidity. Also, a positive relationship existed between the forecast accuracy of earnings per share and stock liquidity.

Nikbakht and Ebrahimi (2013) investigate the impact of the quality of financial reporting on stock liquidity of companies listed in TSE. Using statistical methods (combined data) for 90 investigated companies, they concluded that regardless of the company's stock price, size, volatility, and stock turnover ratio, there was no significant relationship between the company's financial reporting quality and stock liquidity.

Dastgir et al. (2012) carried out research studying the role of quality of earnings in increasing TSE companies' stock liquidity. The results indicated no significant relationship between the earnings quality based on earnings persistence and liquidity measures.

Moradzadehfard et al. (2011) researched the role of accruals management in the stock liquidity of companies listed in TSE. The findings revealed that accruals management had a negative effect on the stock liquidity of companies. To this end, the management of higher projects leads to information asymmetry and higher transaction costs. In this case, traders' tendency without knowing the company's shares educes, and, consequently, the company's stock liquidity goes down.

Thus, the following hypotheses are developed based on the literature:

- 1) Earnings persistence has a significant effect on stock trading days' ratio.
- 2) The earnings response coefficient has a significant effect on the stock trading days' ratio.
- 3) The quality of accruals has a significant effect on the stock trading days' ratio.

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- 4) Annual stock returns have a significant effect on stock trading days' ratio.
- 5) Earnings persistence has a significant effect on stock trading turnover.
- 6) The earnings response coefficient has a significant effect on stock trading turnover.
- 7) The quality of accruals has a significant effect on stock trading turnover.
- 8) The annual stock return has a significant effect on stock trading turnover.

# 3. Research Methodology

#### 3.1. Research Method

Since the findings of the current study can be used by the capital market analysts and investors to evaluate the company's performance, the study is regarded as applied research. So in terms of implementation method, the study can be categorized as descriptive, correlational, and causal research.

The population of the study consisted of all listed companies of TSE at industry groups of metal and mining, chemicals, machinery and equipment, electrical appliances, basic metals and related products, pharmaceutical companies, other mining and quarrying, coal mining, non-metallic mineral extraction, and machines, and component manufacturing. In addition, for choosing sample units, the following criteria must be met:

- 1. The companies were required to be listed in the stock exchange since 2013 that their fiscal year ended in March.
- 2. The information needed in this research had to be available about them.
- 3. They had to have no stopping in activities, and they should not have changed their financial period.
- 4. The companies were supposed not to be part of the financial intermediation companies and not to have consolidated financial statements.

Based on the criteria, a panel structure of data from 99 listed companies throughout 2013-2018 was selected as the study sample. The intended financial data was extracted from TSE software, audited financial statements, and notes related to the selected companies.

#### 4.2. Research Variables and Models

## 4.2.1. Independent Variables

Accruals Quality (AQ): the variable accruals quality is calculated based on Fransic et al. (2005) model through a regression equation as follow:

$$TCA_{i,t} = \Phi_{0,i} + \Phi_{1,i}CFO_{i,t-1} + \Phi_{2,i}CFO_{i,t} + \Phi_{3,i}CFO_{i,t+1} + \Phi_{4,i}\Delta REV_{i,t} + \Phi_{5,i}PPE_{i,t} + \varepsilon_{i,t}$$
(1)

Where:

 $TCA_{i,t}$ : total current accruals, which is calculated by:

$$TCA_{i,t} = \left(\Delta CA_{i,t} - \Delta Cash_{i,t}\right) - \left(\Delta CL_{i,t} - \Delta STDEBT_{i,t}\right) \tag{2}$$

 $\Delta CA_{i,t}$ : Changes in current assets

 $\Delta Cash_{i,t}$ : Cash flow changes

 $\Delta CL_{i,t}$ : Changes in current debt

 $\Delta STDEBT_{i.t}$ : Changes in payables or other short — term liabilities

 $\Delta REV_{i,t}$ : Campany sales changes

 $PPE_{i.t}$ : Gross commodities, machinery, equipment

 $CFO_{i,t}$ : Corporate cash flow, which is calculated by:

$$CFO_{i,t} = NIBE_{i,t} - TA_{i,t} \tag{3}$$

 $NIBE_{i,t}$ : Net profit before unexpected items

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 $TA_{i,t}$ : Total company's accruals, which is calculated by:

$$TA_{i,t} = TCA_{i,t} - Dep_{i,t} \tag{4}$$

 $Dep_{i,t}$ : Depreciation of the company

then

 $oldsymbol{arepsilon}_{i,t}$ : The error term is a measure of *Accurals Quality*.

*Earnings Persistence* (*EP*): the variable earning persistence is measured based on Dechow and Dichev (2002), Francis et al. (2005), and Kohlbeck and Warfield (2008), as follow:

$$Earn_{i,t} = \alpha_0 + \alpha_1 Earn_{i,t-1} + \alpha_2 MB_{i,t} + \varepsilon_{i,t}$$
(5)

Where:

Earn<sub>i,t</sub>: Company's Profit before tax

 $MB_{i,t}$ : Market to book value Ratio

then.

 $\varepsilon_{i,t}$ : The error term is a measure of *Earning Persistance*,

**Earning Response Coefficient** (ERC): The coefficient of earning response is a slope of the returns regression ( $\alpha_1$ ) which is relative to the changes in earning. The variable is measured based on Kormendi and Lipe (1987) and Schipper and Vincent (2002) as follow:

$$Return_{i,t} = \alpha_0 + \alpha_1 \Delta Earn_{i,t} + \varepsilon_{i,t}$$
 (6)

Where:

 $Return_{i,t}$ : Annual stock returns

 $\Delta Earn_{i,t}$ : Change in profit before tax

**Annual Stock Returns** (ASR): the variable annual stock returns are calculated by dividends, capital increase, and capital gain as follow:

$$r_{i,t} = \frac{[(D_t + P_t)(1 + \alpha + \beta)] - (P_{t-1} + c\alpha)}{p_{t-1} + c\alpha}$$
(7)

Where:

 $r_{i,t}$ : Annual stock returns of the company

 $D_t$ : Cash dividend of year t

*P<sub>t</sub>*: Stock price

 $\alpha$ : Percentage of capital increase by cash

 $\beta$ : Percentage of capital increase by retained earnings

# 4.2.2. Dependent Variables

**Trading Days' Ratio** (TDR): The higher the ratio, the greater the liquidity. The ratio is calculated as follow:

$$TDR = \frac{\text{Total Trading Days a year}}{\text{Total Working Days a year}} \tag{8}$$

**Market Turnover** (MTO): The higher the ratio, the greater the liquidity. The ratio is measured by total trading value divided by the total market value of the company's stock at the end of the year, as follow:

$$MTO = \frac{\text{Total Trading Value a year}}{\text{Total Market Value of Stock}}$$
(9)

#### 4.2.3. Control Variables

*Firm Size* (SIZ): the variable firm size is measured by the logarithm of the company's assets at the end of each fiscal year as follow:

$$SIZ = \ln (ASSETS)$$
 (10)

Leverage (LEV): firms' leverage is calculated through total debt divided by total

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assets, as follow:

$$LEV = \frac{Total\ Debt}{Total\ Assets} \tag{11}$$

#### **4.2.4.** Models

To test the research hypotheses, two multiple linear regression models have been used as follow:

$$TDR = \beta_0 + \beta_1 EP + \beta_2 ERC + \beta_3 AQ + \beta_4 ASR + \beta_5 SIZ + \beta_6 LEV + \varepsilon_{ij}$$
(12)

$$MTO = \beta_0 + \beta_1 EP + \beta_2 ERC + \beta_3 AQ + \beta_4 ASR + \beta_5 SIZ + \beta_6 LEV + \varepsilon_{ij}$$
 (13)

# 5. Results and Findings

# 5.1. Descriptive Statistics

Table 1 presents the results of the descriptive statistics of the research. The mean of trading days' ratio equals to 0.540 with a 0.367 standard deviation, as shown in the table. It means that companies stock is averagely traded on 54 percent of working days a year. The mean of variable market turnover is 0.175 with a 0.367 standard deviation. Similarly, the mean of earnings persistence equals 0.260 with 0.974 standard deviations, followed by the earnings response coefficient with -1.619 and 0.752 standard deviations. Moreover, the mean of accruals equals 17785 with a standard deviation equal to 36108, followed by annual returns, size, and leverage, respectively.

**Table 1:** Descriptive Statistics of Variables

Variable	No	Mean	SD	Min	Max
Trading Days' Ratio	495	0.540	0.271	0.012	1.384
Market Turnover	495	0.175	0.367	0.000	3.94
Earnings Persistence	495	0.260	0.974	-3.130	5.247
Earnings Response Coefficient	495	-1.619	0.752	-1.835	3.128
Quality of Accruals	495	17785	36108	312	34391
Annual Returns	495	31.01	78.51	-79.51	734.14
Size	464	15.438	3.125	-3.81	19.54
Leverage	464	11.52	5.23	3.067	17.29

#### **5.2.** Inferential Statistics

Given that the variables of the intended regression model refer to 99 companies over 5 years, before the fit of the model, it should be determined whether the regression equation involves the width of joint elevations and slopes shared by sections. The tests used for this purpose were the integration test or the F-Limer test. This test's null hypothesis is based on the homogeneity of sections and the width of joint elevations. Table 2 shows the test results of the integration capabilities for the first model of the research.

Table 2: Results of the Integration Capabilities for the First Model

P-value	Degrees of Freedom	F-statistic
0.7283	20	0.7887

Regarding Table 2, the *p*-value equals 0.7283, which is smaller than 0.05, which means the homogeneity hypothesis is accepted. The use of the width within the different elevations for different items in the above model is not critical. Put differently, a fit of the regression model in panel form is not required.

Another test that should be weighed before the fit of the model is the random effects test or the Hausman specification test. According to the test of integration capabilities, this

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model includes homogeneous sections and is not a panel model; thus, there is no need to administer the Hausman test. Table 3 represents the results of the regression model of OLS for the first model of the research.

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**Table 3:** Results of the Regression Model of OLS for the First Model

$TDR = \beta_0 + \beta_1 EP + \beta_2 ERC + \beta_3 AQ + \beta_4 ASR + \beta_5 SIZ + \beta_6 LEV + \varepsilon_{ij}$						
Variable	В	T-statistic	P-value	VIF	Tolerance	
Constant	0.425	9.750	0.000	-	-	
Earnings Persistence	0.048	3.837	0.000	1.124	0.890	
Earnings Response Coefficient	-0.019	-1.986	0.048	1.155	0.866	
Accruals Quality	0.015 4.816 0.000 1.052 0.951					
Annual Stock Return	0.0014	1.281	0.201	1.333	0.750	
Size	0.005	2.050	0.041	1.226	0.816	
Leverage	-0.003	-0.825	0.410	1.120	0.892	
$\mathbb{R}^2$			0.117			
Adjusted R <sup>2</sup>			0.106			
Durbin-Watson	2.11					
F-statistic	10.735					
P-value			0.000			

As it is observed, the F-statistic equals 10.735, indicating the significance of the model. Given that the p-value associated with this statistic is 0.000, which shows less value than 0.05 (the significance level test), the null hypotheses are rejected at the level of 0.05. Put differently, with 95% confidence. It can be argued that the simultaneous effect of independent and control variables in the model on the ratio index of trading days is significant.

The *t*-statistics that are reported for each of the independent variables also test the hypotheses of the research. The *t*-statistic and *p*-value of earnings persistence are 3.837 and 0.000, respectively. In addition, the *t*-statistic of the earnings response coefficient is -1.98, and its *p*-value is equal to 0.048. Also, the *t*-statistic and *p*-value of quality of accruals are 4.816 and 0.000, respectively. The *p*-value of all three variables is less than 0.05; to this end, with 95% of confidence, the first, second, and third hypotheses of the research are accepted. Following this, the *t*-statistic of annual stock return is 1.281, and its *p*-value is equal to 0.201, which is greater than 0.05. So, with 95% of confidence, the fourth hypothesis is rejected.

It worth noting that the above results are valid when the basic assumptions of regression hold. According to the Durbin-Watson statistic corresponding to the model represented in Table 3, the model's absence of autocorrelation can be ensured. In the above model, the values of tolerance for all independent variables were greater than 0.5, which shows the lack of collinearity. If the value of VIF is less than 2, it also states the absence of a linear relationship. To this end, in the above model, the values of VIF for all independent variables is less than 2, which again approve the lack of collinearity among the independent variables. The first step in the fit of the regression model of trading turnover refers to studying the homogeneity of sections (the panel form of the model) in a test referring to integration capabilities.

Table 4 shows the results of the integration capabilities for the second model of the research. According to the Table, the *p*-value is less than 0.05. Therefore the hypothesis relating to homogeneity sections and width of joint elevations is rejected. Consequently, it is better to take advantage of the different elevations' width within the above model. In other words, the fit of the regression model should be performed in panel form.

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**Table 4: Results of Integration Capabilities for the Second Model** 

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P-value	Degrees of Freedom	F-statistic
0.000	20	28.601

The Hausman test was used to investigate the random or fixed effects in the model, and its result is shown in Table 5. The amount of *p*-value of the Hausman test for the second model of the research is 0.000, which is smaller than the significance level of the test (0.05). Thus, the hypothesis of the models' random effects is rejected with 95% of confidence, and the research model should be fitted with fixed effects. According to the above test results, the research model is fitted using the Least Squares Regression panel.

**Table 5:** Results of the Hausman Test for the Second Model

P-value	Degree of Freedom	Chi-square Statistic
0.000	3	62.582

The regression model results with fixed effects for the second model of the research are shown in Table 6. It is noteworthy that because stock trading turnover was not normal, the fitted model's remaining is not normal as well, and the fundamental hypothesis is not developed. For this reason, by turning Johnson in Minitab software, first, stock trading turnover was normalized, and then, the model was fitted to the transferred data.

*F*-statistic that equals 16.468 and *p*-value associated with this statistic is 0.000, which shows less value than 0.05 (the significance level test). Therefore, the null hypothesis is rejected at the level of 0.05. To this end, with 95% confidence, it can be argued that the simultaneous effect of independent and control variables in the model on the stock trading turnover is significant. The *t*-statistic of earnings persistence return is 1.446, and its *p*-value is equal to 0.149, which is greater than 0.05. In addition, the *t*-statistic and *p*-value of the quality of accruals are equal to 0.203 and 0.839, respectively. Following this, with 95% confidence, the fifth and seventh hypotheses of the research are rejected.

The *t*-statistic of the earnings response coefficient and its corresponding *p*-value is equal to 0.000. Besides, the *t*-statistic of annual stock return and its *p*-value are -2.589 and 0.010; to this end, the *p*-value is less than 0.05, and with 95% confidence, the sixth and eighth hypotheses are accepted. It worth noting that the above results are valid when the basic assumptions of regression hold. The values of tolerance for all independent variables were greater than 0.5. In addition, the correspondence of the value with VIF for all variables was less than 2. In order to this, the hypothesis related to the lack of collinearity among the adjusted model variables is developed.

Table 6: Results of Fixed Effects Regression of the Second Model

$MTO = \beta_0 + \beta_1 EP + \beta_2 EP + \beta_3 EP $	$MTO = \beta_0 + \beta_1 EP + \beta_2 ERC + \beta_3 AQ + \beta_4 ASR + \beta_5 SIZ + \beta_6 LEV + \varepsilon_{ij}$					
Variable	В	T-statistic	P-value	VIF	Tolerance	
Constant	33518.66	0.387	0.699	-	=	
Earnings Persistence	11219.77	1.446	0.149	1.124	0.890	
Earnings Response Coefficient	-0.005	-9.602	0.000	1.155	0.866	
Accruals Quality	0.005 0.203 0.839 1.052 0.951					
Annual Stock Return	-0.001	-2.589	0.010	1.333	0.750	
Size	-1002.07	-0.151	0.880	1.226	0.816	
Leverage	-1065.76	-0.440	0.660	1.120	0.892	
$\mathbb{R}^2$			0.117			
Adjusted R <sup>2</sup>	0.106					
Durbin-Watson	1.51					
F-statistic	16.468					
P-value			0.000	•		

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### 6. Discussion and Conclusion

There is a significant relationship between the information quality (earnings persistence, earnings response coefficient, and quality of accruals) and the trading days' ratio based on research models. Regarding the significant effect of earnings persistence on trading days' ratio, it can be concluded that whatever profits have continuity and sustainability, investors and shareholders get more confident about their company's performance in the capital market, and most of their expectations would be met. Moreover, investment risk becomes less, and the cost of capital comes down, and more investors intend to purchase and do a stock deal. In other words, earnings persistence impacts the desire to purchase as an indicator of liquidity; thus, it would increase the ratio index of trading days.

Results also indicate a significant relationship between earnings response coefficient and trading days' ratio. This relationship indicates that the higher the earnings response coefficient, the greater the shareholders' stock liquidity's sensitivity. Shareholders with minimal changes in profits tend to have a stock deal, and consequently, stock liquidity increases. Since there is a significant relationship between accruals quality and trading days' ratio, the finding suggests that having high information quality and fewer earnings management, information asymmetry, and investment risks will be less. Moreover, the cost of capital comes down, leading to market efficiency, and as a result, more investors are attracted to the capital market and invest with more confidence. Ultimately, the number of stock trading increases, and the trading days' ratio increases (stock liquidity).

There was no significant relationship between the annual stock return and trading days' ratio because prices influence the greater part of the output; also, it has no relationship with the trading days' ratio, and the main factor of it tends to be the number of the days that stock is traded. In market turnover, there is a positive relationship between the earnings response coefficient and market turnover. In this model, as well as the trading days' ratio, shareholders tend to deal with the smallest change in profit. The significance of stock return represents that the return in this model, which the price constitutes much of it, is significant because the prices form the main part of the output. There is no significant relationship between information quality (earnings persistence and accruals quality) and market turnover in market turnover. In this regard, it can be concluded that there is a relationship between the information quality and trading days' ratio, that the main part of it tends to be the frequency of trading. Following this, information quality has no relationship with market turnover, which constitutes the main part. In this model, it is not only the company's information quality that affects stock turnover. Some other factors, namely political issues, sanctions, sudden surge and drop in prices, the country's capital market efficiency, and government changes, affect market turnover. There is no significant relationship between information quality (accruals quality) and market turnover. The effect of information quality (earnings persistence) on market turnover, which is the main part of its price, is shown to be insignificant.

The followings are specific areas in need of further research. It is recommended that policymakers and administrators try to develop strategies and standards to improve information quality. Besides, it is suggested to investors that apart from information quality, they should consider other factors, including political issues, inflation, sanctions, sudden surge and drop in prices, and their effect on liquidity. Future studies could also investigate the use of other stock liquidity models, such as the difference between the purchase price and the sale of shares and the lack of liquidity and checking the existence of a nonlinear relationship between the information quality and various measures of stock liquidity.

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Research Article

# The Role of Electronic Receipt and Payment Instruments in the Development of Banking Services

Fathollah Tari\*, Hanieh Raeisi

Faculty of Accounting, Allameh Tabataba'i University, Tehran, Iran

#### **Abstract**

The development of E-banking plays an essential role in the performance of the economy. This paper examines whether and how the use of electronic devices affects banking transactions? To answer this question, this paper uses the Chakravorti model that estimated this relationship in the United States and employs the data of Iran's banking system for ten banks - including Melli, Sepah, Saderat, Tejarat, Mellat, Refah, Saman, Parsian, Eghtesad Novin, and Pasargad- over 2009 to 2017. The results show that all three positively affect bank cards' volume of transactions among ATMs, POS terminals, and bank cards. In the meantime, the effectiveness of ATMs is more than sale terminal devices.

**Keywords**: E-Banking, Volume of Banks Transactions, Bank Card, ATM, POS, Number of Branches, Interest Rates of Facilities.

\*Corresponding Author: Professor of Accounting, Email: Tari@atu.ac.ir



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## 1. Introduction

The development of financial markets is one of the most vital sources of economic growth. The payment system's role in the economy is to supply money to various economic enterprises, and banking plays an important role in economic growth and development. Today, banks have used information technology in electronic banking to reduce transaction costs and increase the capacity to attract financial resources by increasing the speed, variety, and quality of their services. The financial sector can affect economic growth in two ways; First, by improving resource allocation and accelerating technological development. These effects originate from financial institutions' intermediary role, which can invest the savings at a lower cost and allocate excess funds in various sectors to the required sectors. In other words, financial intermediation can lead to a more efficient allocation of capital. Banks are among the most important and available financial resources for enterprises by attracting liquidity and providing facilities.

The correct and optimal use of loan and credit flows can lead to increased investment, production, employment, and economic growth and development. Credit facilities, directly and indirectly, affect the employment of manufacturing units and new job opportunities. Injecting monetary credits into the flow of production (as working capital) in the short run increases employment due to fixed capital volume. Still, in the long run, the flow of loans and credit becomes fixed capital. It is accompanied by technological changes that can help develop the economy by improving technical knowledge.

The introduction of new electronic payment tools in Iran refers to 1991 and the start of service of Sepah Bank, which provided the first sample of cards to withdraw from ATM terminals to the banking network customers. (Tavakolian, 2011)

The electronic payment network in Iran includes two networks of interbank information exchange network (SHETAB) and card payment electronic network (SHAPARAK). Since 2002, with the beginning of the activity of the interbank information exchange network (SHETAB), the banking card network has started to work in an integrated manner, and now all cards issued by banks are accepted in all terminals installed throughout the country. In 2004, a resolution was introduced regarding e-money, according to which banks were allowed to enter into contracts with payment service providers (PSPs) companies. In this way, banks were able to provide payment services such as installation, commissioning, training, and maintenance of POS terminals at the point of sale of goods and services, as well as setting up software facilities for payment via mobile and Internet to service provider companies. The SHAPARAK network entered its executive phase in 2012, and it was possible to accept and process sales terminal transactions only in this way.

Currently, Iranian banks provide online banking services through various channels, including ATMs, POS terminals, PIN PAD, telephone banking services, mobile banking, SMS banking, banking services conducted through internet banking and systems. The mobile wallet system, using USSD codes and non-cash kiosks. In this study, our focus is on ATMs and POS terminals.

# 2. Theoretical Basis and Background of Research

## 2.1. Theoretical Foundations

In general, when discussing monetary theories, the aim is to examine the regular relationship between money and other economic variables. In other words, the set of these theories seeks to identify and explain the behaviors of society regarding the demand for money and how it is affected by economic variables or its effect on the behavior of these variables. (Mojtahed and Hassanzadeh, 2005)

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The classic monetary theory lies within the form of Say's law and the quantity theory of money. In 1803, Jan-Batiste Say published a treatise on political economy. He argued that there would be no obstacle to full employment due to a lack of aggregate demand. The claim that "supply creates demand" is an extract from Say's law that seeks to describe the basic characteristics of exchange in a particular economy. It was obvious to classical writers that supply creates equivalent demand. Classical economists, especially Ricardo and Mill, supported Say's law. Not all classical economists accept Say's law and its contents. Malthus says that there is a possibility for the presence of an abundant supply of goods. While Ricardo, Mill, and Say's followers believed that the supply arteries determined total production, Malthus emphasized on-demand as the determining force. But eventually, Ricardo's thoughts prevailed. Ricardo only considered the long term, while Malthus, like Keynes, paid attention to the short term. The functioning of labor and capital markets, which have the support of Say's law, has enabled classical economists with their own theoretical systems to be able to explain the determination of real variables. To study nominal variables, classical economists resort to the quantity theory of money. Many well-known economists have contributed to the development of this theory in expanding its political achievements. These include Hume, Ricardo, Mill, Marshall, Fisher, Pogo, Hayek, and even Keynes. The quantity theory of money has recently been associated with its expansion by money-seekers and Milton Friedman's work.

One of the most important decisions which Baumol & Tobin has analyzed separately is choosing the right time & the right type of changing bonds to the currency. Both of them have emphasized costs & the benefit of keeping money & have arrived at similar conclusions about determinative variables of money trading demand.

Baumol & Tobin believe that the benefit of maintaining money is feeling relaxed, which its cost is losing the profit of keeping the Properties with return (just like bonds).

Deviations in the efficient management of monetary balances for consumer transactions can be explained using the Baumol and Tobin model when profits are made to their assets. (Carbo Valverde, Rodriguez Fernandez, 2014)

If an economic factor (assume that amount as Y) wants to consume real money (assume that amount as Y) during the year, it can keep the money as currency (money without any return) or bonds (with return). The profit rate of bonds in each period is equal to constant R, which states the opportunity cost of keeping money. Indeed, there is a hypothesis that changing bonds into money has a trading cost (called b), which Baumol calls brokerage.

In this framework, the factor K is the real value of the bonds, which is changed to currency in each period, so the total trading cost is equal to  $b(\frac{Y}{K})$  which will be the total needed cost of mediation for exchanging bonds to currency and  $(\frac{Y}{K})$  is the number of withdrawal of money of accounts. the lost profit of keeping money is equal to  $R(\frac{K}{2})$  which  $(\frac{K}{2})$  is the average amount of money which is and the real amount of kept money by a person is equal to M/P. so the whole cost is as follow:

$$Total cost = b \frac{Y}{K^2} + R \frac{K}{2}$$
 (1)

As you see, the less withdrawals (, the more amount of money kept by people), the less cost of mediation and the more expense of lost profit. The number of withdrawals that can minimize total trading cost is obtained when the amount of increase in the mediation cost resulting from one more withdrawal is exactly equal to the decrease of profit cost resulting from the withdrawal of money.

With partial derivation of equation 1 concerning K and equalize it with zero, we can obtain the optimal value of K, which minimizes the total cost of economic factor as below:

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So: 
$$\frac{\delta(Total\ cost)}{\delta K} = -b\frac{Y}{K^2} + \frac{R}{2} = 0$$
 (2)

The conclusion of the above derivation clears the relation between the second root of the factors of K & Y as below:

$$K = \sqrt{\frac{2bY}{R}} \tag{3}$$

In this amount of K, the average of real kept money by economic factors is equal to:

$$\frac{M}{P} = \frac{K}{2} = \frac{1}{2} \sqrt{\frac{2bY}{R}} \tag{4}$$

The equation states that the real balance of money trading demand has a direct link with the second root of Y & diverse link with the second root of R. if the amount of b goes near 0 (zero), the amount of  $\frac{M}{P}$  also goes near to zero (0). This means if the cost of mediation is zero (0), money trading demand with also be zero (0) Because in this case, the factor of time withdrawals the money to buy goods or services, so the trading costs will have an essential role on determining the amount of average money which is kept (Serletis, 2007)<sup>1</sup>.

Technology and e-banking reduce the cost of converting money (bonds) into bonds. In this way, they cause a reduction of the cash reserves of individuals, and as the cash reserves decrease, the banking system's resources will be increased. As a result, banks provide more resources for granting loans, and banking services will be increased.

Keynes considered two types of demand for money: demand for transactions that was a direct function of income and did not depend on interest rates, and demand for speculation, which was inversely related to interest rates (the opportunity cost of keeping the money). Keynes argued that the demand for money in society comes from the sum of these two demands. In general, we need to understand that speculative demand and trading demand cannot be separated. The money demand function can be presented in general as follows:

$$\frac{M}{P} = m(r, y) \tag{5}$$

Keynes, in his theory, states that for investment, all the savings should be gathered. This model, which is based on the bank financial intermediation model, has influenced Keynes growth model (Warner, 2016)

From Kinsey's point of view, economic development requires financial resources. These resources can be provided by increasing liquidity. The development of liquidity can be achieved by increasing the internal funds in the economy, in which banks play a major role in creating money and increasing the internal funds. The development of eservices reduces the liquidity ratio, which causes a further increment of the money multiplier, which supplies the money needed for trading in the economic system. As a result, the development of e-services leads to the development of banking services that

decrease physical money need. So, there is no need to increase domestic currency through the Central Bank, and in this case, there is no need to increase the monetary base, which can cause the greatest inflationary damage.

Money supply has different definitions. The money supply aims to provide financial services to economic agents through various legal and contractual channels. Each money that comes out of the Central Bank and is regarded for creating credit in banking activities is called a monetary base or a strong currency. The monetary base changes according to changes in the Central Bank balance sheet debts and assets. The money multiplier is the interface between money and the monetary base. It is defined as the number of monetary units created by a monetary base unit through the credit creation mechanism. (Shakeri, 2012)

The coefficient is defined as follows:

$$mm = \frac{M_1}{MB} \tag{6}$$

mm is the increasing monetary factor,  $M_1$  is the money storage, and MB is the monetary base storage. Money storage is the sum of private demand deposits with banks and coins and banknotes in the people's hands. The monetary base is also expressed as follows according to the Central Bank's monetary base costs:

$$MB = CU + RR + RRT + RE \tag{7}$$

MB is the monetary base storage, CU is the sum of cash and banknotes held by people, D is the amount of demand deposits of the private sector, RR is the amount of legal reserves of banks in the Central Bank, and RE is the amount of excess reserves of banks in the Central Bank.

cu is the ratio of the coin and banknotes in the hands of the people to the equivalent private sector demand deposits and rr the ratio of the legal reserves of the banks to Central bank to total equivalent private sector demand deposits, re the ratio of the additional reserves of the banks in the Central Bank to equivalent total demand deposits, h is the ratio of coin and banknotes to money storage, and z is the ratio of term deposits and savings to liquidity.

The definition of the supply of funds according to the flow of funds is as follows:

$$M_1 = CU + D \tag{8}$$

Where  $M_1$ Th e money storage is equal to the sum of banknotes and coins in the hands of the people (CU) and private sector demand deposits (D). Another definition of money is a broader definition of  $M_1$  and  $M_2$  is defined as liquidity as follows:

$$M_2 = CU + D + T \tag{9}$$

T is the storage of time and saving deposits. In fact,  $M_2$  is equal to the sum of money and pseudo-money. Suppose cu is the ratio of coins and banknotes in the hands of the people to the private sector's call deposit and rr the rate of legal reserves of banks to the demand deposits of the private sector, re the rate of additional deposits of banks with the Central Bank to the total demand deposits. In that case, h the ratio of coins and banknotes to The reserve of money and z is the ratio of term deposits and savings to liquidity, and rrt is the rate of term deposits; in this case, the liquidity multiplier is defined as follows:

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$$M_2 = \frac{1}{(1-z)\{(rr+re)+(1-rr-re)\}+rrt.z}MB$$
 (10)

In the monetary debate field, there have been new achievements & new measurements & activities & innovations to facilitate meeting the need of human societies. The Central Bank & government should take care of new activities' performance change all kinds of mixing with the volume of money and money demand pattern. They should also monitor all of the steps such as advertising, performance & the maturity of activities. So, realizing the true problem & analyzing the effective factors should always be considered by the Government and the Central Bank. Indeed, the effect of the branch's terminals transaction volume & ATMs on the amount of money demand is negative. So increase in the usage of branch terminals & POSE terminals & ATM terminals should be considered on monetary policies.

The relationship between money supply and non-borrowed reserves arising from Central Bank operations depends on people's preference between cash and demand deposits and the maintenance of surplus reserves by banks or the borrowing of reserves by them through discount rate. (Branson, William, 1997) The definition of money in Iran is in the form of M<sub>2</sub>. Due to the liquidity multiplier components, various governments, Central Bank, banks, people, and foreign sectors affect it. As a result, the development of banking services can affect the coefficients related to the Central Bank and the development of payment tools, which causes an increase in multiplication coefficient and increases banks' resources for lending. Hence, it includes the development of banking services.

## 2.2. Research background

Mazini and Hozuri (2017) showed that e-banking in Iran has reduced private and public banks' costs, and private banks have been more successful in reducing their costs by using electronic banking tools.

Sadeghi and Heidarzadeh (2016) showed that e-banking mechanisms' effectiveness increases the profitability, asset return, and shareholder rights return of selected banks and affects all three.

Shaygani and Dadashi's study (2015) showed that the increase in the number of electronic branches of banks has greatly reduced banking costs and the sensitivity of reducing costs compared to electronic banking in the form of card issuance by the bank is very high.

Bahrami and Zare (2014) found that electronic banking tools such as POS terminals, ATMs, bank telephones, mobile banking, and Internet banking have increased the bank's resources.

Asadzadeh and Kiani (2012) found that the use of information technology has a positive effect on Iranian banks' performance.

Goodarzi and Zobeidi (2008) found that increasing the number of ATM of each bank has positively affected the bank's profitability, which has been increased after the bank joined the SHETAB network. As a result, the expansion of electronic banking has a positive effect on Iranian commercial banks' profitability.

Alghusin, Al-Samadi, Al-Qtish, and Al-Qirem (2017) concluded that bank cards increase the profitability of the banks studied.

Sumra and Manzoor (2011) concluded that illiterate customers do not pay attention to e-banking and are an important obstacle in providing e-banking services and products.

Malhotra (2009) showed that Internet banking services' presentation has no significant relationship with the risk of banks 'profits. In other words, Internet banking

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Electronic Receipt and has not increased the profit risk of the bank.

Amromin and Chakravorti (2007) studied the effect of bank card use on-demand for cash. The results showed that demand for low-denomination banknotes and coins has declined due to the increase in the use of debit cards, as sellers no longer need to return the rest of the money to customers. On the other hand, the demand for high banknotes and coins has been less affected by debit cards, indicating that these sizes of banknotes & coins are also used for purposes other than transaction and trading.

Zakaria (2004) indicated that e-banking services have a negative effect on banks' profitability in the short term. This negative effect is due to banks' investment in the field of infrastructure and staff training, but in the long run, this service will have a positive effect on the profitability of banks.

Damar (2004) studied the effect of the creation of ATM related networks on banks' efficiency. This study showed that the creation of related networks of ATMs positively impacted banks' efficiency.

Carbo and Rodriguez (2014) specifically focus on debit cards and examine debit card transactions through ATMs, terminals and their effect on demand for money. The study results show that the intensity of use of ATMs and POS terminals affects each other. ATMs' positive effect on the volume of transactions is less than the negative effect of terminal devices, and the effect of debit cards on demand for money is negative.

Previous studies have mostly discussed the relationship between e-banking and bank profitability, reducing banking costs and money demand. In contrast, the present study examines the role, impact, and severity of each of the e-banking tools to influence the development of Banking services, which have not been studied in other studies, making the path clearer for economists and policymakers.

# 3. Research Methodology

Considering that the country's banking system does not publish data on revenues from electronic banking, the increase in banking transaction volume is an important factor influencing the increase in fees and even non-fees of banks. In this study, the volume of banking transactions as a proxy and an increase in banking activities' turnover has been used to develop electronic banking tools and a symbol for banking services development.

Ten banks were considered, including Melli, Sepah, Saderat, Tejarat, Mellat, Refah, Saman, Parsian, Eghtesad Novin, and Pasargad, whose data were considered for the years 2009 to 2017.

The selected banks have registered statistics, and in addition, they have the largest volume of banking transactions and the largest market share, and more than 80% of transactions belong to these banks.

The equation used for this study was taken from Chakravorti and Amromin's (2007) work, which is as follows:

TRANS = f(CARD, ATM, LPOS, LLR, inf)

TRANS represents the transaction volume of bank cards. CARD is the number of bank cards, ATM number of ATMs, POS number of sales terminal devices, LR interest rate of bank facilities, and inf is inflation.

The dependent variable of the transaction volume model of bank cards, control variables include an interest rate of facilities and inflation and the number of bank cards, the number of ATMs, and the number of sale terminal devices of the model's independent variables. To investigate the relationship between independent research variables and the volume of banking transactions as a dependent variable, the combined data and panel method are examined in the form of panel data method with constant and random effects. In this study, all variables used except inflation and facility rate were

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used logarithmically to analyze the obtained coefficients as an attraction.

The main hypotheses of the research are:

- The number of bank cards issued has a positive effect on the volume of banking transactions.
- The number of ATMs has a positive effect on the volume of banking transactions.
- The number of sales terminal devices has a positive effect on the volume of banking transactions.

# 4. Model Estimation and Analysis of Findings

Since the performance of different time series models can be affected by different data, before performing any action, we examine the descriptive statistics of the series of research variables in the following table:

**Table 1.** Descriptive Statistics of Variables

Statistic	Bank Transaction Volume	Number of Bank Cards	ATM	POS Devices	Inflation Rate	Earning Interest Rate
Mean	32.00	15.21	7.14	7.78	14.63	14.40
Max	35.80	17.42	8.77	15.96	25.40	22
Min	28.40	5.24	5.17	4.09	10.40	12
S.D	1.76	2.39	0.90	2.05	4.26	2.70
Skewness	0.24	-2.97	-0.19	1.99	1.24	1.84
Kurtosis	2.29	12.31	2.24	9.18	4.07	5.91
Jarque-	2.32	392.1	2.27	174.1	33.90	101.00
Bra	(0.31)	(0.00)	(0.32)	(0.00)	(0.00)	(0.00)

Source: Research Findings

It can be seen that the test of the normal distribution of the mentioned series (Jarque-Bra test) indicates that the density distribution function of the probability of series of the volume of bank transactions and ATMs is normal, and other research variables do not have a normal distribution.

In the next step, using the correlation coefficient table, the relationship between the variables is examined. The Pearson correlation coefficient or *Pearson product-moment correlation coefficient* measures the linear correlation between two random variables. The value of this coefficient varies between -1 and 1, which means: "1" as a complete positive correlation, "0" as no correlation, and "1-" as a complete negative correlation.

**Table 2.** Pearson Correlation Coefficient of the Study Variables

	Earning Interest Rate	Rate of Inflation	Point of Sale Devices	Number of Bank Cards	ATM	Bank Transaction Volume
Bank Transaction Volume	1 (0.00)					
ATM	0.82 (0.00)	1 (0.00)				
Number of	0.62	0.72	1			
Bank Cards	(0.00)	(0.00)	(0.00)			
Point of Sale	0.20	0.25	-0.38	1		
Devices	(0.07)	(0.02)	(0.00)	(0.00)		
Rate of	0.17	0.07	0.10	-0.05	1	
Inflation	(0.13)	(0.50)	(0.38)	(0.64)	(0.00)	
Earning	0.57	0.30	0.31	-0.07	-0.18	1
Interest Rate	(0.00)	(0.00)	(0.00)	(0.49)	(0.10)	(0.00)

In the above table, if the reported significance level is less than 0.05, the null

The Role of Electronic Receipt and Payment Instruments in the Development of Banking Services hypothesis based on that there is no correlation between the variables is rejected. If the significance level is higher than 0.05, the null hypothesis is not rejected at a 95% confidence level. The positive correlation coefficient indicates a positive relationship, and the negative correlation coefficient indicates the negative relationship between the variables. The results indicate a positive and significant relationship between the indicators of e-banking and the volume of banking transactions.

#### 4.1. Unit Root Test of Research Variables

Given that the existence of random trends in time series can make it difficult to interpret the results of econometrics, the choice of estimation method, and the validity of predictions made using the model, Specifically, despite random processes, it is possible that the diagnostic statistics incorrectly indicate the existence of a relationship between the variables. In this case, econometric equations may be estimated using methods that are not appropriate for the data in question. In addition, pattern-based predictions can be distorted. In recent years, econometric experts have focused on the adverse effects of accidental trends in time series on the results of estimates of ordinary minimum squares. They have introduced new methods to resolve them. In random processes, even in cases where there is no real relationship between the variables, common techniques such as the conventional least-squares method may show a significant relationship between them. Such regressions are known as false regressions.

Engel and Granger (1985) proposed aggregation theory to avoid the false results of false regressions. A group of intangible variables will also accumulate if there is at least one mana linear combination between them. The presence or absence of a correlation relationship between pattern variables strongly influences the predictions made by it. If there is no accumulation in a regression equation, weak predictions will be made by the pattern. Time series economists have created methods to test random trends in time series and regression residues. Also, methods have been proposed to estimate the relationships between variables with a random process.

Before modeling the research, in order to prevent false regressions in the research, the variability of the variables has been studied. For this purpose, we have used the Im, Pesaran, and Shin (IPS) (1997) test. Using tests to see if the time series used is a mana process (with zero accumulation) or divergent (with a non-zero accumulation rate) has been studied. For this purpose, the unit root test has been investigated on research variables. The unit root test is performed in the case of the presence of intercept and round. The results of the table below indicate that the volume of banking transactions, the number of ATMs, and the interest rate of facilities have unique roots and non-stable due to not rejecting the zero hypothesis and would be stable by one differentiation.

But other variables, because the prob value is less than 0.05, reject the null hypothesis based on a single root, and these variables are at the mana level.

Table 3. IPS Root Test

Variable	Variable IPS Test		
Variable	Test Statistics	Prob	
Bank Transaction Volume	-1.974	0.024	
ATM	-4.011	0.000	
Number of Bank Cards	-4.584	0.000	
Number of Branches	-4.597	0.000	
Terminals	-0.667	0.252	
Inflation Rate	-3.723	0.000	
Facility Interest Rates	5.738	1.000	

Source: Estimated results

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# 4.2. Cointegration Test

At this stage, it is necessary to determine the model's optimal level using the criteria for determining the interruption. The optimal interval determination should be based on the number of model variables and sample size. The table below shows the optimal interruption based on different criteria for selecting the selected model's optimal interval. Because the Schwartz criterion causes a lower degree of freedom than other criteria, the optimal interval has been selected based on the Schwartz criterion in this study.

**Table 4.** Determination of the Optimal Number of Model Interruptions

<b>Number of interruptions</b>	Akaike Statistic	Schwartz Statistic
1	-5.172	*-3.866
2	-4.664	-2.269
3	-4.913	-1.430

Source: Research results

As shown in the table above, this model's optimal interruption based on the interruption Schwartz criterion is one. Before estimating the model, we examine the validity of the long-term relationship between the research variables using the aggregation test.

**Table5.** Test results are also panel aggregation

Test Statistic	Dependent Variable on Volume of Transaction			
Statistic	ADF			
T-Statistic	-4.30			
Prob	0.000			

Source: Estimated results

As the table information shows, for the model in question, the reported error level is less than 5% or 0.05, and the null hypothesis is rejected, so it can be stated that there is a long-term relationship between the variables.

## 4.3. Explaining the Model and Reviewing the Hypothesis

In order to examine the factors affecting the transaction volume of bank cards, the simplest case is considered first. As mentioned earlier, suppose that intercept and the coefficients between the sections and periods are the same, resulting in erroneous sentences varying between periods and errors. This is the simplest approach that can be estimated using the least-squares method (OLS). Perhaps the most important downside to this is that assuming coefficients fixed are considered highly constrained and may lead to model error. This means we cannot estimate a real relationship between the dependent variable and descriptive variables; therefore, we seek to intervene like the sections. However, this does not mean that this approach is incorrect. In other words, the effects of the cross-section on the dependent variable may be the same. However, it is assumed that the expansion of e-banking on various commercial banks' trading volume is different. Therefore the fixed and random effects are also considered in the model. With this explanation, it is first assumed that the effects of the various variables related to the bank in this study will affect bank card transactions' trading volume. In other words, the share of e-banking of Bank IM or Bank JM will have the same effect on the trading volume of transactions of Bank IM or Bank JM cards. Also, the intercept of the model is the same between different sections (banks). To diagnose whether a combination method is used or a panel data method, we refer to the F-test or the Limer test. If the Limer test allows the use of panel data, then we should realize whether the method of random effects is used or the model with constant effects, in which case we

The Role of Electronic Receipt and Payment Instruments in the Development of Banking Services use the Hausman test.

The results of the F-Limer test:

According to the F-statistic, the assumption of zero width of the same origin and slope for all units will be tested against the panel model. The results are presented in the table below for the research model. Diagnostic test for model estimation as pooled data or panel data with constant effects.

#### 4.3.1. The Results of the F-Limer Test

According to the F-statistic, the zero intercept assumption and the same origin and slope for all units will be tested against the panel model. The results are presented in the table below for the research model.

Table 6. Diagnostic Test for Model Estimation as Pooled data or Panel Data with Fixed Effects

Fitted Models	Statistic	d.f.
F Statistics of Equation	9.90	(61 and 9)

Based on this table, it can be seen that the F-test and the prob value of that hypothesis reject the existence of fixed effects against the Pooled state in both equations. In other words, since the probability level (Prob) obtained in the F-test is less than 0.05, then the null hypothesis based on that the fixed effects on the regression model are redundant is rejected at the 5% (and 10%) level. So estimation of the model in the form of Panel data is preferred to consolidated data.

## 4.4. Test for Selecting Fixed Effects or Random Effects

In this section, one of the two methods of estimating panel data, which is fixed effects and random effects, must be selected. The Hausman test is used to determine the estimation method in panel data. Based on this test, the rejection of the null hypothesis indicates the fixed effects method's use. Therefore, the Hausman test was performed for different models with different explanatory variables. The Hausman test results, which are reported in the table below, related to the equation of the volume of banking transactions, indicate the rejection of the null hypothesis and the choice of the method of constant effects for the equations.

**Table 7.** Diagnostic Test for Estimating the model of panel data with constant effects versus panel data with random effects

paner data with random criects				
Fitted Models	Statistic	Prob.		
Chi-square Statistics of two equations	27.75	0.000		

**Table8.** Estimation of the Model of Factors Affecting the Transaction Size of Cards Transactions:

	Indonesia desta se sichles	Model		
	Independent variables coefficients	The dependent variable for Size of Cards		
	coefficients	Transactions		
		Coefficient	Prob value	
1	Intercept	*15.08	0.000	
2	ATM	*2.28	0.000	
3	No. of Cards	*0.12	0.009	
4	No. of branches	**-1.17	0.054	
5	POSs	*0.21	0.008	
6	Inflation rate	*0.04	0.000	
7	Interest rate of facilities	*1.97	0.000	
	Statistics of Goodness of Fit	Determination coefficient:	0.96	
	Statistics of Goodness of Fit	F(Prob): (0,000) 121,17		

Source: The result from the estimation

<sup>\*</sup> Significance in the error level of 1%.

<sup>\*\*</sup> Significance in the error level of 10%.

Based on the results of the research, it can be stated that the prob values of all the coefficients of the variables at the error levels of 5 and 10% are less than 0.05 and 0.10, which indicates a significant difference from zero for these coefficients and the total significance of the model coefficients.

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The variable coefficient of the number of sales terminal devices is 0.21, which indicates the positive and significant effect of this variable on the volume of transactions of bank cards. This means a 1% increase in the number of stable buying terminals will increase the volume of bank card transactions up to 0.21%. Theoretically and experimentally, it is expected that the volume of banking transactions will increase as the number of shopping terminals increases.

**Table 9.** Summary Results of Hypotheses Test

Row	Hypothesis	Type of Effect	Result of Test
1	The number of bank cards issued in each bank positively affects transaction volume through bank cards.	Direct & meaningful	Hypothesis accepted
2	The number of ATMs has a positive effect on the volume of transactions trading through bank cards.	Direct & meaningful	Hypothesis accepted
3	The number of bank branches has a positive effect on the volume of transactions trading through bank cards.	Indirect & meaningful	Hypothesis accepted
4	The number of devices installed in the bank's terminal positively affects the volume of transactions through bank cards.	Direct & meaningful	Hypothesis accepted

The variable coefficient of the number of ATMs in Equation is 2.28, which indicates the positive and significant effect of this variable on the transaction volume of bank card transactions. The interpretation of the obtained coefficients is as follows: 1% increase in the number of ATMs (other conditions are stable) leads to a 2.28% increase in the transaction volume of bank card transactions. It is expected that increasing the number of ATMs and better banking services will increase the volume of transactions.

Fourth. In the second fitted equation, the variable coefficient of the number of bank cards was significant. The coefficient of the current amount of bank cards issued is 0.12. The result shows that if we have a 1% increase in the number of issued bank cards, there will be a 0.12% increase in bank cards' transaction volume (other conditions are stable).

Diagnostic tests are in line with Jarque- Bra's statistic, the distribution of disruption sentences of the estimated model, is normal. The self-correlation test performed indicates the non-rejection of the null hypothesis based on the absence of self-correlation in the disruption sentences.

Good model fitness statistics such as R2 or coefficient of determination are also obtained in the fitted equations 0.96%, which indicates that the independent variables of the model explain about 96% of the changes of the dependent variable, also according to the high F statistic and its prob value, The total fitted regression is significant.

## 5. Conclusion

The first hypothesis of the research was that the number of bank cards issued in each bank positively affects the volume of transactions through bank cards. Considering the coefficient of this variable in an equation related to the volume of bank trading transactions, this variable's positive effect has been approved. Based on the results, it has been shown that if the number of issued bank cards increases, the bank can increase access to financial resources for the bank through more financial turnover. In other words, an increase in the number of issued bank cards leads to an increase in transaction

The Role of Electronic Receipt and Payment Instruments in the Development of Banking Services volume of bank trades and, on the other hand, leads to an increase in the bank's profitability and the development of banking services.

The second hypothesis of the study is that the number of ATMs in the bank positively affects the volume of transaction trading's through bank cards. Due to this variable's coefficient in the equation related to the transaction volume of banking transactions, this variable's positive effect was confirmed. Based on the results, it has been shown that this variable has affected the volume of banking transactions based on the above ratio. Based on the results, it can be stated that with the expansion of the use of ATMs and the use of non-face-to-face operations for banking operations, the balance of people's accounts and turnover has been increased, and this can lead to an increase in bank profitability through bank access to cheap financial resources. Accordingly, an increase in ATMs can increase banks' performance and services by increasing the volume of transactions and account balances.

The third hypothesis of the research was rejected. The number of bank branches on the volume of transaction trades through bank cards positively affected this variable's coefficient in the estimated equation. Based on the obtained results, it can be stated that with the increase in the number of branches, it is expected that the use of e-banking services will be decreased, and the issued bank cards will have less effect on the transaction volume. The fourth hypothesis seeks to investigate the effect of the number of POS terminals on the volume of transaction trading through bank cards, confirmed by this variable's positive and significant coefficient in the estimated equation. Based on the results, it has been shown that increasing the number of sales terminal devices through revenue streams such as fees and money laundering in the accounts of individuals and banks can pave the way for the development of banking services.

From the obtained results, it can be understood that ATMs and POS terminals' effect is more than other variables, and in the meantime, ATMs' effect is more than that of terminals. One of the reasons for the low number of POS terminals is that each store has several POS devices from several banks. Based on that, financial turnover is prorated between the sales terminal devices, and their efficiency is reduced. This has attracted the attention of policymakers, who need to pay more attention to this direction in order to be more profitable and develop banking services. The lowest coefficient and the amount of impact is related to the variable of bank cards, which can be due to having multiple cards by individuals and not using some cards because each bank requires people to open an account and receive a card for each lending operation or even to guarantee the process of the loan for others - while in practice, people exchange and learn and pay and operate with one or two main accounts and also receive related cards too, so the per capita number of bank cards in the country is very high, and practically, multiple cards cannot be effective, which is also a problem with having a large number of cards for costumers. In general, it imposes additional costs on the whole society, which is not beneficial for the country's economy. So it is recommended to design cards in the banking system which the information of all accounts can be stored and used in one place. This has been done in some countries and also for national cards in the country. The initial structure for such a possibility has been foreseen. In general, it can be said that facilitating the use of tools for people and proper and logical planning on the proposed variables can make their application more pervasive, and as a result, according to Tobin's theory, reduces liquidity and increases funds in the banking system which eventually Provides conditions for economic growth and development for the country.

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