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Investigation of the Effect of Financial Complexity on Profit-Sharing Policies with the Moderating Role of Information Asymmetry

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Abstract


The current research employs data envelopment analysis to investigate how financial complexity influences profit-sharing policies, with information asymmetry playing a moderating role. This research is categorized as applied based on its objectives and descriptive-correlational based on its methodology. The study's statistical population comprises all companies listed on the Tehran Stock Exchange, from which a sample of 109 companies was selected spanning six years, from 2017 to 2022. The hypothesis testing approach utilized in this study involved multiple ordinary regressions analyzed with Eviews software. The findings indicate that financial complexity significantly impacts profit-sharing policies, and that information asymmetry moderates the relationship between financial complexity and profit-sharing policies.

Keywords: Financial complexity, Profit-sharing policies, Information asymmetry.

1 | Introduction

One of the most effective factors in decision-making is adequate and relevant information about the decision topic. If the required information is asymmetrically distributed among individuals, it may lead to different results than for a single issue. Therefore, before the information itself is important to the decision maker, the quality of the information distribution needs to be carefully assessed [1]. As information asymmetry in a company's stock increases, its intrinsic value will differ from the value investors in the capital market place on the stock. As a result, the actual value of the company's shares will be different from the value expected

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by shareholders. In capital markets, it is important to remember that many investors are ordinary people whose only access to important information is through company announcements. An example of this type of announcement is the announcement of estimated earnings per share, where the company forecasts and publishes the expected earnings per share. If some investors are active in the capital markets and are better informed than others, they can influence supply and demand and create price gaps. The main reason for this is the existence of information asymmetry in the capital market, which puts people who are informed about the earnings announcement (or any other important news) in a more favourable decision-making position than others [2].

In this regard, the role of information cannot be ignored in today's world, and it can be said that the most important commodity that plays a fundamental role in the allocation of economic resources today is financial information. This information is a useful guide for economic decisions, considering the users' needs. Any economic decision made in a business unit, if the environmental conditions that govern it are ignored, will likely result in an error in that decision [3]. Today, the activities of almost all organisations and business units are influenced by the environmental factors in which the organisation operates. The existence of undeniable relationships between organisations and their environment makes their performance and profitability largely dependent on external environmental factors.

In this case, changes in these environmental factors can affect the performance and profitability of the organisation. One of these factors is the uncertainty and complexity of the company's environment, which causes large fluctuations in the company's reported profit but is not under the control of management [4]. In communicating with the environment, organisations constantly face conditions that indicate a lack of awareness of events and actions in the business environment, or an inability to predict external changes and their impact on anticipated decisions. These conditions are referred to as environmental uncertainty [5]. Environmental uncertainty means that decision-makers do not have enough information about environmental factors and face difficulties predicting external changes. It also means the inability to assign probabilities to future events or to predict the possible outcomes of a decision. Environmental uncertainty results from two dimensions: The dynamics (Stability or instability) of environmental factors and the simplicity or complexity of the environment. The results of dynamics arise from technological, economic, and political forces as well as market changes and industry contingencies. Finally, this research seeks to answer these fundamental questions: Does the Complexity of Financial Statements (CFS) affect dividend policy? Furthermore, is the relationship between financial statement complexity and dividend policy moderated by information asymmetry?

2| Theoretical Literature

2.1| Financial Complexity Statements

The organization's mission requires strategies to consider the nature and scope of its current and future activities and take the necessary steps for success and survival in competition and technological change. Strategies such as vertical integration downwards, vertical integration upwards, horizontal integration, market penetration, market development, product development, homogeneous diversity, heterogeneous diversity, horizontal diversity, partnerships and the like are used to respond to changes in the business environment, maintain a competitive position and benefit from relative advantages in the market. As the operating environment of enterprises changes and becomes more complex, new information needs arise and, given the different characteristics of different activities, the collection and presentation of their results in a single set of financial reports affects the characteristics of their items and the relationship between the elements of financial reports and causes inhomogeneity [6].

2.2 | Profit Sharing Policies

Dividend policy is one of the most controversial topics in finance. Conflicting theoretical models, sometimes lacking strong empirical support, attempt to explain a company's dividend policy [7]. Dividend payouts can be discussed from two very important perspectives. On the one hand, it is a factor that influences companies' future investments. This is because paying dividends reduces internal resources and increases the need for external resources. On the other hand, many of the company's shareholders want cash dividends, so managers must always balance their interests and profitable investment opportunities to maximise wealth. Therefore, dividend decisions made by managers are very sensitive and important [8].

In addition to maximising shareholder wealth, fully considering the factors and constraints affecting dividend policy will ensure the company's competitive survival and continued growth and development. The company's policy on the retention or distribution of profits and its form is called the dividend policy. Dividend policy is of great importance because of its influence on the investor's perspective, the company's financing plan and capital budgeting, the company's cash flow status, and the increase of the gearing ratio [9].

2.3 | Information Asymmetry

The foundations of this theory were laid in the 1970s by three great economists [10]. They were awarded the Nobel Prize in economics in 2001 for their work on "The analysis of markets with asymmetric information". According to this theory, managers have more information about the company's future prospects and actual value than outside investors [11]. One of the important points always raised about capital markets, especially stock markets, is the discussion of market efficiency, according to which all information available in the market is reflected in its effects on stock prices. From the efficient market hypothesis perspective, the reason for the existence of accounting can be explained as information asymmetry, where one of the parties to the transaction has more information than the other party.

This is due to the existence of transactions and internal information. Even if the stock market price fully reflects the information, it is still possible that people inside the organisation have more information about the company's qualitative status than people outside the organisation and can take actions to gain more benefits due to this information advantage [12].

2.4 | Research Background

Hejazi et al. [13] studied the "Effect of managers' ability on dividend policy of companies listed in Tehran stock exchange". The study results showed that managers' ability has a positive and significant relationship with companies' dividend policy. Rangzan Moghadam and Lashgari [14] surveyed the "Effect of dividend policy on investment decisions with emphasis on financial reporting quality". The study results showed that the adverse effect of cash dividends on investment is more severe in firms where a large part of the firm's value comes from growth opportunities. Still, the quality of financial reporting does not reduce the negative effect of cash dividends on investment.

Hejazi et al. [13] studied the relationship between dividend policy and information asymmetry from the signaling theory perspective. They found that dividend policy (Dividend ratio) has a positive and significant relationship with market information asymmetry [15]. The higher the dividend ratio, the higher the information asymmetry. Ghasemi et al. [16] conducted a study to investigate the relationship between information asymmetry and dividend policies in manufacturing companies listed on the Tehran Stock Exchange. The results of the study showed that there is a significant relationship between information asymmetry and dividend policy.

Rezaei and Bafham Mehrabani [17] conducted a study titled "The effect of operating cycles and information asymmetry on the level of conservatism of companies using the c-score method." The hypothesis test results showed a positive and significant relationship between information asymmetry and the level of conservatism of companies, as well as a positive and significant relationship between operating cycles and the level of

conservatism of companies. Dang et al. [18] conducted a study titled "Investigating the relationship between earnings quality and stock price asymmetry and synchrony". The results of the study show that there is a significant relationship between the level of earnings quality and information asymmetry. Harritt [19] conducted a study to examine the "Effect of annual report complexity (Related to tone complexity) on dividend policy and dividend policy value". The results showed that the dividend signalling theory exists in the United States. Companies with more complex annual reports tend to pay higher dividends in a high information environment. When information asymmetry is high, managers use dividends as a tool to reduce information asymmetry. Furthermore, the results show that dividend policy has a more substantial impact on firm value, especially when the tone of annual reports is very complex.

Alvi [20] examined "Profit and debt policy as a corporate governance mechanism in Indonesia". The results showed that profit and debt policy can be used as a corporate governance mechanism to reduce agency conflicts between majority and minority shareholders in high and low concentration ownership structures. However, debt policy has the opposite effect. Ferdinand et al. [21] conducted a study entitled "The relationship between investment opportunities, debt levels and dividend policy in Korean companies". The findings and results of the study indicate that companies with many investment opportunities have low debt and dividend levels. On the other hand, companies with limited investment opportunities have high debt and dividend levels.

2.5 | Research Hypotheses

Taking into account the theoretical and research foundations mentioned above, the research hypotheses are as follows:

Hypothesis 1. Financial statement complexity affects dividend policy.

Hypothesis 2. Information asymmetry moderates the relationship between financial statement complexity and dividend policy.

3 | Methodology

3.1 | Statistical Population

This research is applied research in terms of its purpose and a descriptive survey research in terms of its research method. All the information related to the research variables is obtained using the new Rahavard Novin software, the financial statements of the companies listed on the stock exchange, and the accompanying notes. The target statistical population in this research is all companies listed on the Tehran Stock Exchange from 2017 to 2022. The statistical sample is made by the method of elimination sampling (Systematic) in which the selected companies are selected from a set of companies listed in the Tehran Stock Exchange, considering the limitations mentioned below, which have the following conditions:

- I. The company's shares should not be suspended from trading on the stock exchange for more than 3 months during the research period.
- II. The company's financial year should end on 29/12/XX to ensure comparability of information.
- III. All data required for research should be available to the companies under review completely and continuously.
- IV. They should not belong to investment companies and financial intermediaries (Banks, investment, and leasing companies).

Considering the above conditions, 109 companies remained, representing the actual statistical population to be studied. For this reason, the present study was conducted using the statistical method of data envelopment analysis and a multivariate regression model. In this regard, the research hypotheses were tested using Eviews software and analysed according to the statistical hypothesis testing plan described in the following sections.

3.2| Model and Research Variables

In this study, the following regression models were used to test the hypotheses:

$$DIV_{it} = \beta_0 + \beta_1 CFS_{it} + \beta_2 SIZE_{it} + \beta_3 GROTH_{it} + \beta_4 ROA_{it} + \beta_5 LEV_{it} + \varepsilon_{it}. \quad (1)$$

$$DIV_{it} = \beta_0 + \beta_1 CFS_{it} + \beta_2 ASY_{it} + \beta_3 CFS_{it} * ASY_{it} + \beta_4 SIZE_{it} + \beta_5 GROTH_{it} + \beta_6 ROA_{it} + \beta_7 LEV_{it} + \varepsilon_{it}. \quad (2)$$

Based on the principles presented in this study, the variables are expressed in four groups: independent, dependent, moderating, and control, which are given below.

3.2.1| Independent variable: CFS

We use the financial statement readability index to measure the CFS.

Readability of financial reports

The FOG index is used to measure the readability of financial [22] reports. This index was first introduced into the theoretical foundations of accounting. The FOG index is a function of two variables: The average number of words per sentence and the percentage of complex words (The percentage of words in a text with three or more syllables). The sum of these values is proportional to 0.4. The FOG index is therefore calculated as follows:

$$FOG = 0.4(\text{words per sentence, percent of complex words}). \quad (3)$$

The number of words per sentence (Calculated by dividing the total number of words by the number of sentences in the notes). Complex words have three additional syllables. Long sentences and a high proportion of complex words increase this index and therefore reduce readability.

- I. Randomly select a sample of 100 words from the beginning, a sample of 100 words from the middle, and a sample of 100 words from the end of the report.
- II. Count the number of sentences in each sample.
- III. Find the average sentence length by dividing the number of words by the number of complete sentences in each 100-word sample.
- IV. Count the number of three-syllable words and words with more than three syllables (Complex words) in each of the 100-word texts.
- V. Add the number of complex words to the average number of sentences.
- VI. Multiply the sum of difficult words and the average number of words in sentences by a constant of 0.4.
- VII. Carry out the calculations in paragraphs 4, 5, and 6 for the other 100-word samples.
- VIII. Calculate the average of the results of all three samples by adding and dividing by the number.

*The relationship between the FOG index and the readability level is as follows: FOG ($0 \geq 18$) means that if the FOG index is less than 18, we give this company a code (Zero), which is coded (Easy).

However, if the FOG index is greater than 18, we give the company a *Model (1)* coded (Complex).

Dependent variable: Dividend policy (DIV)

To measure this variable, the dividend payout ratio index was used as follows:

$$\text{Earnings per share (EPS) / Cash dividend per share, (DPS))} = \text{Dividend policy (DIV)}.$$

Moderator variable: Information asymmetry

Information asymmetry examines transactions where one party has more or better information than the other. This phenomenon creates a kind of power imbalance in transactions that can sometimes lead to trade ruin or, in the worst case, market failure. One such measure is the range of bid and ask prices for stocks. Vinkath and Chiang [23] used this model to determine the range of bid and ask prices for stocks.

$$IA = \frac{(AP-PB) \times 100}{(AP-PB) \div 2} \quad (4)$$

I. IA: The range of the difference between the bid price for buying and selling shares of company i in month t.

II. Ap: The average bid price for selling shares of company i in month t.

III. PB: The average bid price for buying shares of company i in month t.

Control variables

I. GROTH: Ratio of market value to book value of equity.

II. ROA: Ratio of after-tax profit to total assets.

III. Size: Logarithm of the total market value of assets.

IV. LEV: Ratio of total debt to total assets of the company.

4 | Findings of the Research

4.1 | Descriptive Statistics of the Data

In the descriptive statistics section, data analysis was carried out using central indices such as mean and dispersion indices such as standard deviation and minimum and maximum. The descriptive statistics of the study are presented in *Table 1*.

Table 1. Descriptive statistics of the study.

Variable	Symbol	Mean	Median	Max	Min	S.D
Financial leverage	LEV	0.561	0.566	0.013	1.274	0.201
Dividend policy	DIV	1.119	0.6000	-4.04	29.61	2.52256
Information asymmetry	ASY	47.92	56.35	0.000	96.56	32.07692
Firm size	SIZE	12.309	12.210	10.615	14.498	0.643
Growth opportunities	GWTH	2.889	2.371	-5.542	10.950	1.028
Return on assets	ROA	0.124	0.135	-0.842	0.561	0.132
Financial statement complexity	CFS	0.5029	1.000	0.000	1.000	0.50035

The most important central indicator is the mean, which indicates the distribution's equilibrium point and centre of gravity. It is also a good indicator of the centrality of the data. The standard deviation is also one of the most important dispersion parameters and a measure of the dispersion of the observations from the mean. Now, according to the results of *Table 1*, the mean value of the financial leverage variable indicates that, on average, about 56% of the assets of the sampled companies were financed by debt. Another noteworthy point in this table is that the market value of the equity of most of the sample companies is higher than their book value, as evidenced by the average value of the growth opportunities variable (2.889).

5 | Results

The results of the research models' pre-tests are presented in *Table 2*.

Table 2. Prerequisite tests of research models.

Test	Stat	P-Value	Result
F Lemmer	4.119	0.000	Appropriate panel method
Hausman	9.714	0.021	Fixed effects model
Pagan Godfrey brooch	405.72	0.000	Heterogeneity of variances

According to *Table 2*, since the probability value is 0.000 and this value is less than 0.05, the hypothesis of panel data is confirmed at the 95% level. Now, the Hausman test is used to determine the research model. According to *Table 2*, since the probability value is 0.000 and this value is less than 0.05, the model has fixed effects at the 95% level. After examining the model's impact, the variance's heterogeneity is reviewed. According to *Table 2*, the variances are unequal since the probability value is 0.000, and this value is less than 0.05. Therefore, to solve this problem, the Generalized Least Squares (GLS) method has been used to estimate the model.

5.1 | Analysis of the Results of the First Research Hypothesis

The summary of the results of the regression *Model (1)* is presented in *Table 3*:

Table 3. Statistical results of testing the first research hypothesis.

Variable	Coeff.	S.D	t Stat.	Sig.
Constant	0.24	0.007026	3.545	0.001
Complexity of financial statements	-0.063	0.027	-2.328	0.035
Firm size	0.447	0.115	3.886	0.0004
Growth opportunity	0.284	0.039	7.144	0.003
Sales return	-0.055	0.040	3.410	0.024
Financial leverage	-0.055	0.025	-2.025	0.0352
Effects specifications				
Fixed intercept (Dummy variables)				
Weight statistics				
Mean of the dependent variable	21.864		R2	0.487
S.D. of the dependent variable	18.740		R2 Adjusted	0.452
Sum of squares of the residuals	0.602		Fisher's	17.473
Dubrin-Watson statistic	1.994		P-Value	0.000

The results of *Table 3* show that the value of the F statistic in this figure and its significance level (0.000) indicate the overall significance of the fitted regression model at the 5% error level. Considering the value of the adjusted coefficient of determination of the model, it can be claimed that about 45% of the changes in the dependent variable are explained by the independent and control variables of the model. Also, examining the value of the Durbin-Watson statistic (1.994) also confirms the absence of autocorrelation between the components of the regression model disturbance. As is evident from the results of the figure, the estimated coefficient and t-statistic related to the financial statement complexity variable CFC are negative and significant at the 5% error level, indicating the existence of a negative and significant effect of financial statement complexity on dividend policies. Therefore, the first hypothesis of the research is accepted.

5.2 | Analysis of the Results of the Second Research Hypothesis

The summary of the results of the regression *Model (2)* is presented in *Table 4*:

Table 4. Statistical results of testing the second research hypothesis.

Variable	Coeff.	S.D	t Stat.	Sig.
Constant	0.024	0.007	3.545	0.001
Financial statement complexity	-54.903	-0.168	-3.208	0.022
Information asymmetry	.284	0.039	7.144	0.025
Interaction effect	0.483	0.022	21.669	0.012
Firm size	1.952	0.179	10.889	0.0001
Growth opportunity	0.139	0.040	3.410	0.004
Sales return	0.290	0.039	7.353	0.021
Financial leverage	-0.0007	0.0003	-2.119	0.041
Effects specifications				
Fixed cross-sectional effects				
Weight statistics				
Mean of the dependent variable	21.864		R2	0.422
Mean of the dependent variable	17.320		R2 Adjusted	0.452
Sum of squares of the residuals	0.502		Fisher's	3.518
Durmian-Watson statistic	2.260		P-Value	0.000

The results of *Table 4* show that the value of the F-statistic in this figure and its significance level (0.000) indicate the overall significance of the fitted regression model at the 5% error level. Considering the value of the adjusted coefficient of determination of the model, approximately 45% of the changes in the dependent variable are explained by the independent and control variables of the model. Similarly, examining the value of the Durbin-Watson statistic (2.260) also confirms the absence of autocorrelation between the disturbance components in the regression model. As can be seen from the results in the figure, the estimated coefficient and the t-statistic related to the interaction effect variable (CFC*ASY) are significant at the 5% level of error, indicating the existence of a moderating effect of information asymmetry on the relationship between financial statement complexity and dividend policy. Therefore, the second hypothesis of the study is accepted.

6 | Discussion

This study uses data envelopment analysis to investigate the effect of information asymmetry on the relationship between the CFS and dividend policies. The first hypothesis of the study stated that the CFS affects dividend policies. As observed in the regression analyses, the CFS has a significant impact on dividend policies, and as a result, the first hypothesis of the study is confirmed. In explaining the results of this hypothesis, it can be pointed out that the CFS reduces the dividend policies of companies listed on the Tehran Stock Exchange. The findings obtained from testing this hypothesis are consistent with the research results of [19–21].

The study's second hypothesis was that information asymmetry moderates the relationship between financial statement complexity and dividend policy. As observed in the regression analyses, information asymmetry moderates the relationship between financial statement complexity and dividend policy, confirming the study's second hypothesis. The results of this hypothesis are consistent with the results of the studies by [18] and [24].

According to the results and achievements of the research, the following axes can be identified about the application areas:

- I. The complexity of the organization's environment reduces users' ability to analyze the usefulness or uselessness of a company's operations. As a result, conflict and asymmetry between managers and external users increase, and the demand for information provided by management, including projected profit, increases.

- II. Given that the CFS plays an important and influential role in the accuracy and reliability of projected profit and profit reported by management. Therefore, with the increase in the CFS, the reliability and reliability of information contained in financial statements, including profit reported in the income statement, decreases, and this means that with the increase in the CFS, the use of incorrect presentation methods in financial statement figures decreases.

Author Contributions

Amir Ghafourian, student, is responsible for project management and research design.

Saeed Mohseninia is responsible for supervision and consulting in the research process.

Hamed Bagheri is responsible for collecting and analyzing research data.

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Data Availability

The data used in this study were obtained from publicly available financial statements of companies listed on the Tehran Stock Exchange. The author may provide additional data upon request.

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