

Dividend Policy and Agency Costs with the Moderating Role of Board Independence in Companies within the Agriculture, Animal Husbandry, Food Industries, and Related Services Group Listed on the Tehran Stock Exchange and Iran Fara Bourse

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Author's contribution

Reza Nemati Koshteli and Seyed Milad Hosseini Kakavandi developed the study concept and design. Rahman Rajabi and Reza Nemati Koshteli acquired the data. Seyed Milad Hosseini Kakavandi and Reza Nemati Koshteli analyzed and interpreted the data, and wrote the first draft of the manuscript. All authors contributed to the intellectual content, manuscript editing and read and approved the final manuscript.

Availability of data and materials

The data that support the findings of this study are available from the corresponding author, upon reasonable request.

Conflict of interest

The authors declare that they have no conflict of interests.

Abstract

Dividend policy and agency issues are closely interrelated. Agency theory states that dividends help control agency costs by reducing free cash flows; this, in turn, compels managers to seek financing through capital markets, thereby subjecting them to external monitoring. Board independence is considered a governance mechanism that provides important monitoring functions to resolve agency conflicts between management and shareholders. The objective of the present study is to examine the moderating role of board independence in the relationship between dividend policy and agency costs. In terms of purpose, this research is applied, and in terms of methodology, it is descriptive-correlational. The research sample consists of 75 companies listed on the Tehran Stock Exchange during the period from 2020 to 2024. Multiple regression models were employed to test the research hypotheses. The findings indicate that dividend policy has a significant negative relationship with agency costs. Furthermore, the results indicate that board independence moderates the relationship between dividend policy and agency costs.

Keywords: Agency Costs, Corporate Governance, Board Independence, Dividend Policy.

Introduction

An agency relationship is a contract under which various individuals or groups appoint an individual or another group as their agent or representative and place them in a position of responsibility and authority to provide a specified set of services. Entering into such a contract requires delegating decision-making authority to the agent and paying compensation for the services rendered. Once an agency relationship is established, each party seeks to maximize its own personal interests. The relationship between company owners and management provides management with the opportunity to pursue objectives other than the maximization of shareholders' wealth. The payment of cash dividends can reduce agency costs (Fakher & Abdelfettah, 2012).

Dividend policy affects the objective of maximizing shareholders' wealth. However, since numerous factors influence dividend policy, the payment of dividends to shareholders does not necessarily imply the maximization of shareholders' wealth. Existing theories, particularly agency theory, describe a conflict of interest between information producers and information users. According to this theory, managers do not always act in shareholders' best interests and may use company assets suboptimally. The existence of conflicts between managers and shareholders can lead to agency problems that, according to agency theory, entail costs. The objective of the present study is to investigate the relationship between dividend policy and agency costs and to examine the moderating role of board independence in this relationship. This chapter presents the general framework and research design of the study.

Theoretical Foundations and Literature Review

Dividend policy and agency issues are among the most important topics in financial management and accounting. These two issues are closely interrelated because dividend policy is one of the corporate decisions that is influenced by agency conflicts (Harada & Nguyen, 2006). Various perspectives have been proposed regarding the factors affecting agency costs, and numerous empirical studies have been conducted in this area. (Belden et al., 2005) argue that reducing the amount of free cash flow available to management is one of the key mechanisms shareholders use to mitigate agency costs.

Dividend payments can reduce free cash flow and thereby prevent management from utilizing excess funds for personal interests. In other words, shareholders possess the right to decide how profits should be allocated, whether through dividend distributions or reinvestment in the company's operations (Rozeff, 1982).

Agency theory states that dividends help control agency costs by reducing free cash flows. This is because a reduction in free cash flow compels companies to seek additional financing from capital markets and, consequently, become subject to external monitoring (Easterbrook, 1984). (Jensen, 1986) demonstrated that dividends may reduce management's opportunity to invest cash in projects that benefit managers rather than shareholders. Dividend announcements may also signal future investment opportunities (Bhattacharya, 1979).

(Jensen, 1986) argued that the existence of free cash flows can lead to agency costs. (Rozeff, 1982) and (Easterbrook, 1984) similarly stated that dividend distributions can reduce agency costs because, on the one hand, dividend payments reduce free cash flows and the associated agency costs. On the other hand, they compel firms to rely more heavily on capital markets to finance future funding needs. As a result, firms become subject to monitoring by active market participants, which, in turn, reduces agency costs. (Schooley & Barney Jr, 1994) argued that

firms pay cash dividends to access capital markets, thereby reducing agency costs by increasing capital market monitoring.

In addition, theoretical foundations and empirical evidence indicate that corporate governance mechanisms have an impact in both cases. Governance mechanisms are mechanisms designed to protect shareholders' and investors' rights within a company. These mechanisms also systematize the decisions and activities of company managers and, in a way, reduce the agency costs imposed on owners. These mechanisms consist of various components. Institutional investors, audit quality, board size, the presence of independent directors, and directors' participation in the company's ownership are all considered governance mechanisms. Other tools can also be considered, depending on the business environment and market in which the company operates. The degree of market competition, rules and barriers to entry and exit, and the closed or open nature of the economic system are among these (Henry, 2010).

In general, substantial evidence indicates that the presence of independent directors leads to increased firm value and improved performance (Hamdan & Al Mubarak, 2017), as well as enhanced disclosure practices (Shehata, 2016).

(Heidari et al., 2016) examined the impact of corporate governance systems on reducing agency costs using a structural equation modeling approach. For this purpose, data from 68 companies listed on the Tehran Stock Exchange were collected from audited financial statements covering the period from 2006 to 2012. The results showed that the corporate governance system has a significant negative effect on agency costs. This finding suggests that corporate governance mechanisms can help reduce conflicts between management and shareholders, thereby decreasing the costs imposed on shareholders and other stakeholder groups.

(Hamdan, 2018), in examining the relationship between dividend policy and agency costs and the moderating effect of board independence on this relationship, found that dividends are positively and significantly associated with asset utilization. The study concluded that firms employ dividend policies to reduce free cash flow and thereby mitigate agency costs. Furthermore, the findings indicated that board independence positively moderates the relationship between dividend policy and agency costs.

Based on the theoretical foundations and prior research, the following hypotheses were developed:

Hypothesis 1: Dividend policy is associated with a firm's agency costs.

Hypothesis 2: Board independence moderates the relationship between dividend policy and a firm's agency costs.

Given the theoretical arguments and empirical findings presented above, the main research question of the present study is whether board independence moderates the relationship between dividend policy and agency costs. In other words, does the interaction between dividends and board independence affect a firm's agency costs?

Methodology

In terms of research design, this study is quasi-experimental, and in terms of purpose, it is applied research. The primary objective of applied research is to achieve practical outcomes, identify solutions to real-world problems, and develop applied knowledge within a specific field. Given that the objective of the present study is to identify the effect of institutional ownership on financial stability, this research falls under applied research. Furthermore, in

terms of implementation, the study adopts a descriptive-correlational approach. From a research design perspective, it falls into the quasi-experimental research category.

The statistical population of the present study comprises all companies listed on the Tehran Stock Exchange in the agriculture, animal husbandry, food industries, and related services sectors during the period from 2020 to 2024. The quality of the information and the accessibility of the data were among the reasons for selecting this population. A simple, accessible random sampling method was employed to select the sample, yielding a final sample of 75 companies.

Research Variables

In this study:

DIV represents dividend policy and serves as the independent variable. Following (Chung et al., 2002), dividend policy is measured by the ratio of dividends paid to net income after tax.

Agency Cost represents agency costs and is the dependent variable of the study. According to (Hamdan, 2018) and (Henry, 2010), the asset turnover ratio is used to measure agency costs. This ratio is one of the well-known indicators that reflects managerial efficiency and the way managers utilize the firm's assets. The higher this ratio, the greater the managerial efficiency and, consequently, the lower the agency costs. This ratio is calculated by dividing a firm's sales by its total assets.

BIND represents the proportion of independent directors and serves as the moderating variable. This ratio is calculated by dividing the number of independent board members by the total number of board members.

Control Variables :Consistent with (Hamdan, 2018) and Doukas et al. (2005), the following variables are included as control variables:

Firm Size (Size): Firm size is included as a control variable in the research models. The natural logarithm of total assets measures it.

Investment Opportunities (MTB): Following (Grullon & Michaely, 2007), the market-to-book ratio of shareholders' equity is used as a measure of investment opportunities.

Profitability (ROA): Profitability is measured using Return on Assets (ROA), calculated by dividing net income by the book value of total assets.

Financial Leverage (Lev): Financial leverage is calculated by dividing total liabilities by total assets.

Results

Descriptive Statistics

The purpose of presenting descriptive statistics is to gain an understanding of the sample based on descriptive indicators. Therefore, before testing the research hypotheses, it is necessary to describe the research data. Descriptive statistics provide an overall picture of the data, reveal the underlying patterns within the dataset, and establish a basis for explaining the relationships among the variables used in the study. (Table 1) presents the most important descriptive statistics, including measures of central tendency (mean and median) and dispersion (standard deviation), for 375 firm-year observations.

Table 1. Descriptive statistics of research variables

Variable	Symbol	Observations	Mean	Median	Max.	Min.	SD
Dividend Policy	DIV	375	0.6071	0.6217	15.1850	0.0000	0.7161
Agency Cost	AgencyCost	375	0.8736	0.7553	5.1442	0.0061	0.5587
Independent Directors Ratio	BIND	375	0.6699	0.6021	1.0000	0.0000	0.1764
Firm Size	Size	375	14.1511	13.9174	19.1499	10.1665	1.4900
Investment Opportunities	MTB	375	3.2348	2.4169	309.2090	-113.2820	11.8713
Profitability	ROA	375	0.1233	0.1063	0.6313	-0.7973	0.1437
Financial Leverage	Lev	375	0.5691	0.5801	2.4221	0.0127	0.2144

Based on the data presented in (Table 1), the mean value of the dividend policy variable, calculated as the ratio of dividends paid to net income, is 0.6071. This indicates that, on average, the sample firms distribute approximately 60 percent of their earnings as dividends to shareholders. The mean agency cost, measured by the asset turnover ratio, is 0.8736, reflecting the extent to which company managers utilize corporate assets. The average proportion of independent directors is 0.6699, indicating that approximately 66 percent of board members in the sampled firms are independent directors. The mean investment opportunity is 3.2348, suggesting that, on average, the market value of the sample firms is approximately three times their book value of shareholders' equity. The highest value of investment opportunities belongs to Pars Khodro Company in fiscal year 2014. At the end of that year, the company's market value was 15,220,847 million /-IRR, while its book value of shareholders' equity was 49,225 million /-IRR. The lowest value of growth opportunities belongs to Saipa Azin Company at the end of fiscal year 2014. At that time, the company's market value was 1,541,429 million /-IRR, whereas its book value of shareholders' equity was 13,607 million /-IRR. Regarding the distribution of variables, the results reported in (Table 1) indicate that the means and medians differ only slightly. The closeness of the mean and median values suggests that the data are approximately normally distributed. In a normally distributed statistical population, observations are assumed to be systematically and uniformly distributed around the mean, and the probability of observing a specific value on either side of the mean is approximately equal.

Hypothesis Testing

In studies that employ linear regression models to test research hypotheses, it is necessary to examine and test the assumptions of linear regression before estimating the coefficients. Reliance on statistical results without considering the regression model's underlying assumptions is insufficiently valid and cannot be used confidently for decision-making, particularly in hypothesis testing. Assumptions such as normality, linearity, and

homoscedasticity are among the most important prerequisites for regression analysis. Therefore, before interpreting the regression results, the model's assumptions were examined to verify the validity of the findings.

Examination of the Normality of the Dependent Variable Distribution

The normality assumption for the dependent variable is one of the most important assumptions in linear regression models. In addition, the normality of residuals (error terms) is also a fundamental assumption and a necessary condition for the validity of regression analysis. However, if the dependent variable is normally distributed, the residuals are generally expected to be normally distributed as well. Furthermore, according to the Central Limit Theorem, as the sample size increases and approaches infinity, the distribution tends toward normality. The present study includes a sample of 75 listed companies over five years, yielding 375 firm-year observations. Therefore, it is expected that the research variables follow a normal distribution. Nevertheless, to confirm this assumption for the dependent variable (Agency Cost), the Kolmogorov–Smirnov test was employed. In this test, if the test statistic's significance level exceeds the study's predetermined significance level, the normality of the dependent variable's distribution is confirmed. The test was conducted using SPSS software, and the results are presented in (Table 2). According to the results reported in (Table 2), the significance level of the Kolmogorov–Smirnov test statistic (0.1589) for the Agency Cost variable is greater than the 5% significance level. Therefore, the normality of the dependent variable distribution is confirmed.

Table 2. Kolmogorov–Smirnov test results

Variable	Observations	Mean	Standard Deviation	Test Statistic	P-Value
Agency Cost	375	0.8735	0.5587	1.3086	0.1589

Examination of Homoscedasticity of Residuals

The heterogeneity of the residual variances in the linear regression model is another important assumption that affects the estimation of coefficient standard errors and, ultimately, statistical inference. Therefore, it is necessary to ensure the homogeneity of the residual variances before fitting the models and estimating the coefficients. If the residual variances of a linear regression model are not constant, it is necessary to take measures to eliminate them. In the presence of heteroscedasticity, the generalized least squares (GLS) method is an efficient way to estimate the desired model. Therefore, in the present study, if the assumption of homogeneity of the residual variances is not established, the GLS method has been used instead of the ordinary least squares (OLS) method. In this study, the Pagan-Broch test has been used to examine heterogeneity in residual variances. The null hypothesis and its counter-hypothesis in this test are as follows:

H₀: The residuals have constant variance (homoscedasticity).

H₁: The residuals have non-constant variance (heteroscedasticity).

In this test, if the F statistic's p-value exceeds the error level (0.05), the null hypothesis is rejected, and the model's residuals have unequal variance. The results of this test are presented in (Table 3).

Table 3. Results of the Breusch–Pagan Heteroscedasticity Test

Breusch–Pagan Test	Description	Model 1	Model 2
	F-statistic	2.8936	5.4012
	P-Value	0.2561	0.0087
	Lagrange Multiplier Statistic	198.015	243.107
	P-Value	0.0934	0.0005

Based on the results of the variance heterogeneity test (Pagan's brooch) in (Table 3), the test's significance level in the first research model is 0.2661. It exceeds the 0.05 error level of the study, so the null hypothesis (i.e., identical variances) is accepted with 95% confidence. Therefore, the first research model has identical variances, so ordinary least squares regression can be used. Regarding the second research model, the p-value for the test statistic is 0.0087. The test statistic is less than the 5% critical value, so the null hypothesis of this test (identical variances of the residuals) is rejected. As a result, the second model suffers from unequal variances. To address heteroskedasticity in the residuals of the second model, generalized least squares has been used to estimate the coefficients.

Examination of Autocorrelation among Residuals

According to the materials presented in the third chapter of the research, the Watson-Dobbin statistic is used to examine the autocorrelation between the residuals of the research models. The value of this statistic ranges from 0 to 4. If the value of this statistic is equal to zero, it indicates the existence of a complete positive autocorrelation. If it is equal to 4, there is a complete negative autocorrelation between the residuals. If this value is around 2, there is no autocorrelation (Torabi et al., 2025).

Examination of the Independence of Explanatory Variables

Another important assumption in multivariate regression models is that the explanatory variables are independent of each other. This means that there is no strong correlation between the variables used in the model. If there is collinearity among the explanatory variables, the coefficient of determination (R^2) may be high, but the independent variables may not be statistically significant. There are several methods to detect collinearity. In the present study, the variance inflation factor (VIF) and tolerance indices provided by SPSS were used. In the absence of correlation between the explanatory variables of the model, the variance inflation factor index will be equal to 1. However, in regression models, there will be some correlation among the variables. However, what is important is the high correlation among the explanatory variables, which will cause problems in estimating the regression model. In general, a variance inflation factor (VIF) below 10 indicates low collinearity among the explanatory variables.

Stationarity Test of Variables

Stationarity tests are among the most important procedures for reliably estimating regression coefficients. To avoid spurious regression, stationarity tests are employed. In this study, the Levin, (Varmazyar et al., 2025) unit root test was used to assess the stationarity of the variables. The results are presented in (Table 4). In this test, the null hypothesis indicates the presence of a unit root, meaning that the variable is non-stationary. Therefore, if the significance level is less than 5 percent, the null hypothesis is rejected, and it can be concluded with 95 percent confidence that the variable is stationary. Based on the results reported in (Table 4), the significance levels for each research variable are below 0.05. Therefore, the null hypothesis is rejected, and the stationarity of all research variables is confirmed. Consequently, it can be

concluded that the sample firms do not exhibit structural changes over the study period, and the use of these variables in the regression models will not result in spurious regression.

Table 4. Stationarity test results for research variables

Research Variables	Test Statistic	Significance Level
DIV	-17.2634	0.0001
AgencyCost	-19.0512	0.0000
BIND	-27.1945	0.0000
Size	-24.7102	0.0000
MTB	-18.5413	0.0000
ROA	-27.1438	0.0000
Lev	-15.2391	0.0009

Model Estimation Method

Economic models can be classified into three categories based on the type of statistical data used: time-series, cross-sectional, and panel data. In recent years, panel data methods have been widely utilized in empirical studies. Under this approach, a set of cross-sectional units (firms) is observed over several years. The use of panel data increases the number of observations to a desirable level, thereby alleviating the problem of insufficient information in the study. Accordingly, the statistical method employed in this research is multivariate regression analysis using pooled data. The primary motivation for combining cross-sectional and time-series data is that, provided an appropriate model is specified, more efficient estimation, inference, and forecasting can be achieved (Aflatooni & Nikbakht, 2010). Given these considerations, before estimating the models, it is necessary to determine the appropriate estimation method (pooled or panel). For this purpose, the Chow test (F-Limer test) was employed. The null and alternative hypotheses of the F-Limer test are defined as follows:

H₀: Intercepts are identical across cross-sectional units (pooled estimation method).

H₁: Intercepts differ across cross-sectional units (panel estimation method).

In this test, if the significance level of the F-Limer statistic is less than 5 percent, the null hypothesis is rejected and the alternative hypothesis—namely, differing intercepts and the appropriateness of the panel data method—is accepted. Conversely, if the significance level exceeds 5 percent, the null hypothesis of identical intercepts (pooled estimation) is accepted.

The panel data approach itself can be estimated using either the Random Effects Model or the Fixed Effects Model. To select between these two approaches, the Hausman test is performed. The hypotheses of the Hausman test are stated as follows:

H₀: No correlation exists between the individual effects and the explanatory variables (Random Effects Model).

H₁: Correlation exists between the individual effects and the explanatory variables (Fixed Effects Model).

In the Hausman test, if the significance level of the test statistic is less than 5 percent, the null hypothesis is rejected, thereby supporting the use of the Fixed Effects Model. The results of the F-Limer and Hausman tests are presented in (Table 5).

Table 5. Results of the F-Limer and Hausman Tests

	Description	Model 1	Model 2
F-Limer Test	F-Limer Statistic	5.4865	1.5981
	Significance Level (Sig.)	0.0012	0.1921
	Degrees of Freedom	(730, 146)	(728, 146)
	Test Result	Panel Method	Pooled Method
Hausman Test	Chi-Square Statistic	8.1034	--
	Significance Level (Sig.)	0.0000	--
	Degrees of Freedom	5	--
	Test Result	Fixed Effects Model	--

Based on the results reported in (Table 5), the p-value for the F-Limer statistic for Model 1 is 0.0012, which is lower than the 5 percent significance level. Therefore, the null hypothesis is rejected, and the panel data method is deemed appropriate. Consequently, the next step is to conduct the Hausman test to choose between the Fixed Effects and Random Effects models. According to the Hausman test results, the p-value for the chi-square statistic is 0.0000, which is below the 5 percent significance level. Therefore, the null hypothesis is rejected, confirming the appropriateness of the Fixed Effects Model.

In the second research model, the probability value of the F-test statistic is 0.1921, which is higher than the 5% error level, so the null hypothesis of this test, that is, the same width from the origin, or the combined method, is accepted. Therefore, it is more efficient to use the combined method to fit the second research model.

Hypothesis Testing

To test the research hypotheses, each regression model is estimated separately.

Testing the First Hypothesis

According to the first hypothesis, dividend policy is significantly related to a firm's agency costs.

The statistical formulation of the hypothesis is as follows:

H₀: Dividend policy does not have a significant relationship with a firm's agency costs.

H₁: Dividend policy has a significant relationship with a firm's agency costs.

H₀: $\alpha_1 = 0$

H₁: $\alpha_1 \neq 0$

To test this hypothesis, the following regression model is estimated:

$$AgencyCost_{it} = \alpha_0 + \alpha_1 DIV_{it} + \alpha_2 Size_{it} + \alpha_3 MTB_{it} + \alpha_4 ROA_{it} + \alpha_5 Lev_{it} + \varepsilon_{it}$$

To test the first hypothesis, the significance of the coefficient of the independent variable DIV is examined. If the probability associated with the Student's t-statistic for coefficient α_1 is less than the significance level of 0.05, the hypothesis is supported. The results of estimating the first regression model are presented in (Table 6).

Table 6. Results of Testing the First Hypothesis

Dependent Variable: Agency Cost, Independent Variable: Dividend Policy, Number of Observations: 882 Estimation Method: OLS – Panel Data (Fixed Effects Model)						
Variables	Coefficients	Standard Error	t-Statistic	Probability of t-Statistic	Collinearity indices	
					VIF	Tolerance
Constant	-10.645	1.37123	-7.763	0.0000	--	--
DIV	1.091	0.036249	3.011	0.0024	1.759	0.5682
Size	-0.7021	0.32034	-2.191	0.0371	2.009	0.4976
MTB	0.0891	0.07303	1.220	0.3011	4.070	0.2457
ROA	-0.1985	0.23945	-0.8291	0.5502	3.156	0.3168
Lev	1.1032	0.36928	2.987	0.0134	2.319	0.4312
F-statistic		45.0172		Adjusted R ²		0.3417
Significance Level		0.0000		Durbin–Watson Statistic		2.125

Considering the results of fitting the first model of the study, which are presented in (Table 1), the significance level of Fisher's F statistic is 0.0000, which, considering that it is lower than the desired error level of this study, i.e., 0.05, it can be claimed that with 95% confidence, the overall significance of the first model is statistically confirmed. This means that at least one explanatory variable is significantly related to the dependent variable. The value of the Durbin-Watson statistic is 2.125, which indicates the absence of autocorrelation between the residuals of the model and the validity of another classical assumption of the regression model. The value of the adjusted coefficient of determination is 0.3417, which indicates that the significant variables of the model explain about 34% of the changes in the dependent variable (agency costs).

In order to test the first hypothesis of the research, the significance level of the t-test statistic related to the coefficient of the independent variable in question, namely the dividend policy (DIV), is considered. Given that the significance level of the t-statistic of the dividend policy variable (DIV) is equal to 0.0024, which is less than the error level of 0.05, the coefficient of this variable is significant. Therefore, the existence of a significant relationship between the dividend policy and agency costs, and as a result, the first hypothesis of the research is confirmed. On the other hand, considering the positive sign of the above variable, and since the asset turnover ratio is an inverse measure of agency costs, it can be concluded that there is a significant and inverse relationship between the dividend policy and agency costs.

Regarding the control variables of the model, the significance level of the t-statistic of the company size variable (Size) is equal to 0.0371, which is less than the error level of 0.05, so the company size variable has a significant and positive relationship with agency costs. The significance level of the t-statistic of the investment opportunities variable (MTB) is equal to 0.3011, which is more than the error level of 0.05, so it can be claimed that at the 95% confidence level, the investment opportunities variable has no significant relationship with agency costs. The p-value for the t-statistic of the profitability variable (ROA) is 0.5502, which is greater than the research error level. Therefore, the significant relationship of profitability with agency costs is not confirmed. Also, the significance level of the t-statistic of the financial leverage variable (Lev) is equal to 0.0134, which is less than the error level of 0.05, so the financial leverage variable has a significant and positive relationship with agency costs.

Testing the Second Hypothesis

According to the second hypothesis, board independence moderates the relationship between dividend policy and agency costs.

The statistical formulation of this hypothesis is as follows:

H₀: Board independence does not moderate the relationship between dividend policy and agency costs.

H₁: Board independence moderates the relationship between dividend policy and agency costs.

H₀: $\alpha_3 = 0$

H₁: $\alpha_3 \neq 0$

To test this hypothesis, the following regression model is estimated:

$$AgencyCost_{it} = \alpha_0 + \alpha_1 DIV_{it} + \alpha_2 BIND_{it} + \alpha_3 BIND_{it} \times DIV_{it} + \alpha_4 Size_{it} + \alpha_5 MTB_{it} + \alpha_6 ROA_{it} + \alpha_7 Lev_{it} + \varepsilon_{it}$$

The criterion for accepting or rejecting the second hypothesis is the probability associated with the t-statistic of the interaction term (BIND $\times$ DIV). In other words, the significance of coefficient α_3 is examined. If the t-test for this coefficient is significant at the 0.05 level, the coefficient is considered statistically significant, thereby supporting the second research hypothesis. The results of estimating the second regression model for testing the second hypothesis are presented in (Table 7).

Table 7. Results of testing the second hypothesis

Dependent Variable: Agency Cost, Independent Variable: Dividend Policy, Moderating Variable: Board Independence (BIND), Number of Observations: 882						
Estimation Method: Generalized Least Squares (GLS) – Pooled Estimation Method						
Variables	Coefficients	Standard Error	t-Statistic	Probability of t-Statistic	Collinearity indices	
					VIF	Tolerance
Constant	-3.054	0.66184	-4.615	0.0000	--	--
DIV	0.7142	0.25792	2.7691	0.0086	4.581	0.2183
BIND	1.2170	0.54415	2.2370	0.0331	5.359	0.1866
BIND $\times$ DIV	0.0943	0.03061	3.0829	0.0025	2.141	0.4672
Size	-0.4867	0.18438	-2.639	0.0116	3.851	0.2597
MTB	0.1238	0.07982	1.5516	0.1283	2.848	0.3511
ROA	-0.1402	0.15042	-0.9321	0.3513	2.232	0.4479
Lev	0.9054	0.36637	2.4713	0.0178	1.804	0.5543
F-statistic		52.1934		Adjusted R ²	0.3856	
Significance Level		0.0000		Durbin–Watson Statistic	2.645	

Based on the results of estimating the second regression model presented in (Table 7), the p-value of the Fisher F-statistic is 0.0000, which is lower than the 0.05 significance level. Therefore, the overall statistical significance of the research model is confirmed at the 95 percent confidence level. The Durbin–Watson statistic equals 2.645, indicating no autocorrelation in the model residuals. The adjusted coefficient of determination (Adjusted R²) is 0.3856, indicating that the significant explanatory variables account for approximately 38 percent of the variation in agency costs.

With respect to testing the second hypothesis, the significance of the coefficient of the interaction term ($\text{BIND} \times \text{DIV}$) is examined. In other words, the significance level of the t-statistic associated with coefficient α_3 is compared with the study significance level of 0.05. Since the t-statistic for the interaction term ($\text{BIND} \times \text{DIV}$) is 0.0025, which is lower than 0.05, the coefficient is statistically significant at the 95 percent confidence level. Consequently, the second research hypothesis is supported. Therefore, it can be concluded that board independence positively moderates the relationship between dividend policy and agency costs.

Regarding the control variables, the results of the second regression model are consistent with those obtained from the first regression model. Specifically, Firm Size (Size) and Financial Leverage (Lev) exhibit significant negative and positive relationships with agency costs, respectively. However, Investment Opportunities (MTB) and Profitability (ROA) do not demonstrate statistically significant relationships with agency costs.

Discussion and Conclusion

Dividend policy and agency issues are closely related, as dividend policy is one of the issues affected by agency conflicts. Agency theory states that dividends help control agency costs by reducing free cash flows, because doing so prompts companies to turn to capital markets for more funding and thus become subject to external supervision. Therefore, dividend distribution, on the one hand, reduces free cash flows and the agency costs associated with them, and, on the other hand, causes companies to turn to capital markets to finance their future needs and become subject to the supervision of active market forces, which in turn reduces agency costs.

The corporate governance structure is one of the tools used to protect shareholders' and investors' rights in companies. These mechanisms consist of various components. Institutional investors, audit quality, board size, the presence of independent directors on the board, and directors' participation in the company's ownership are all considered governance mechanisms. Other tools can also be considered, depending on the business environment and market in which the company operates. The degree of market competition, rules and barriers to entry and exit, and the closed or open nature of the economic system are among these. A review of the existing literature indicates that corporate governance mechanisms affect dividend policy and agency costs. These mechanisms systematize the decisions and activities of company managers and, in a way, reduce the agency costs imposed on owners. According to the free cash flow theory, in companies with weaker corporate governance, management tends to retain cash and therefore distribute it less through dividends, so that it can use the surplus funds to provide more personal benefits, such as paying bonuses. On the other hand, according to the substitution hypothesis, dividend policy is one of the mechanisms that reduces the conflict between shareholders and management. According to proponents of this theory, dividends and reduced agency costs emphasize limiting management activities. When there is no active monitoring, management allocates available cash to inefficient investment activities or unnecessary luxuries. Therefore, owners vote to distribute dividends in order to reduce the inappropriate use of available funds by management for such activities. The independence of board members is considered one of the most important monitoring mechanisms. Independent directors can provide important monitoring functions to help resolve the agency conflict between management and shareholders. Considering the above arguments, the present study examines whether board independence moderates the relationship between dividend policy and the agency costs of the company. By raising this issue, the groundwork was laid for conducting research work, and two hypotheses were formulated as follows:

Hypothesis 1: Dividend policy is associated with a firm's agency costs.

Hypothesis 2: Board independence moderates the relationship between dividend policy and a firm's agency costs.

The research process began with the formulation of the above two hypotheses and with the review of the theoretical and empirical literature related to the research topic, during which the criteria for measuring the research variables were determined. These variables were organized into models for hypothesis evaluation, and research models were extracted. In the continuation of the research process, the role and operational definition of the variables were determined. In the following, the effort to select the appropriate method for conducting the research continued, and the multiple regression method was used in accordance with the relevant models. After determining the appropriate research method for the research conditions, a sample of 75 companies in the agriculture, animal husbandry, food industries, and related services groups accepted on the Tehran Stock Exchange during the period 2010 to 2014 was selected, and by referring to data processing software such as Rah Avar Novin and the Kodal site, data related to the research variables were collected and categorized in the form of an Excel file. After preparing the data for the research variables, the data were entered into Eviews statistical analysis software, and data analysis and testing of research hypotheses were performed using tests appropriate for multiple regression models.

According to the study's first hypothesis, the dividend policy is significantly related to the company's agency costs. The results of fitting the regression model for the first hypothesis of the study showed that the model is significant. Since the t-statistic for the coefficient on the dividend policy variable is less than the 0.05 error level, there is a significant relationship between the dividend policy and the company's agency costs. As a result, the first hypothesis of the study is confirmed at the 95% confidence level. Confirmation of the first hypothesis of the study means that, with a 95% confidence level, it can be claimed that there is a significant relationship between the dividend policy and the company's agency costs. Also, because the asset turnover ratio is an inverse measure of agency costs, the positive sign of the coefficient on the dividend policy variable in the regression model indicates that an increase in dividends will lead to a decrease in agency costs. This finding is consistent with the theoretical arguments in the study's theoretical literature. For example, (Rozeff, 1982) and (Easterbrook, 1984) argued that dividend payments can reduce agency costs because, on the one hand, dividend payments reduce free cash flows and the agency costs associated with them, and on the other hand, they cause companies to turn to the capital market to finance their future needs and be under the supervision of active market forces, which in turn reduces agency costs. (Jensen, 1986) also claims that increasing dividends reduces agency costs because free cash flows can create agency problems. From an empirical perspective, these findings contradict the results of (Houshmand Neghabi & Farahnak, 2025) and (Mirfathi Barkeiani et al., 2024). They confirmed the existence of a positive and significant relationship between cash dividends and agency costs. On the other hand, this finding is consistent with the results of (Hamdan, 2018) and (Aminipour et al., 2024). They studied the relationship between dividend policy and agency costs and found that dividends help reduce agency costs.

According to the second hypothesis of the study, board independence moderates the relationship between dividend policy and agency costs. According to these results, the significance level of the t-statistic of the interactive variable ($BIND \times DIV$) is equal to 0.0025 and less than the error level of 0.05; therefore, the coefficient of this variable is significant at the 95% confidence level, and as a result, the second hypothesis of the study is confirmed. Therefore, it can be claimed that board independence moderates the relationship between dividend policy and agency costs. The positive sign of the coefficient for the interactive

variable indicates that board independence strengthens the relationship between dividend policy and agency costs. Confirmation of this hypothesis indicates the important role that independent directors play in the effectiveness of dividend policy in reducing agency costs. In other words, companies that distribute higher dividends and have more independent directors face agency problems related to the free cash flow available to management. This finding is consistent with theoretical arguments. For example, (Fathi et al., 2025) and (Kariuki, 2025) argued, based on the substitution hypothesis, that in environments with weak corporate governance, companies resort to other tools, such as dividends and the inclusion of independent directors, to reduce agency problems and costs. From an empirical perspective, these findings are consistent with (Hamdan, 2018) results. He examined the relationship between dividend policy and agency costs and the moderating effect of board independence on this relationship. He found that, on the one hand, dividends are negatively related to agency costs. On the other hand, board independence has a positive moderating role on the relationship between dividend policy and agency costs. Although no similar studies were found in the field of domestic studies, the following research findings, thematically relevant to the present study, are presented. (Edokpa et al., 2024) and (Mahmoud, 2022) found a negative, significant relationship between the percentage of non-executive board members and agency costs. (Zaher et al., 2018) found that the percentage of executive board members does not significantly affect agency costs.

Considering the results obtained in this research, the following practical suggestions are presented to help users of this research:

1. According to the findings of the first hypothesis test of this study, which states that dividend policy has a significant relationship with agency costs, such that increasing dividends leads to reducing agency costs, investors are advised to pay attention to dividend policy on the one hand and agency cost criteria on the other hand in their investment decisions, along with other factors; because company managers can exploit the company's dividend policy to increase available free cash flow and, as a result, to be more opportunistic. It is also recommended that capital market participants disclose agency cost information through various criteria that companies must disclose to increase investors' awareness and understanding of companies' issues and agency costs.
2. Given the finding that board independence affects the relationship between dividend policy and agency costs, current shareholders are advised to place greater emphasis on the presence of independent directors when electing board members. Independent directors constitute one of the most important governance and monitoring mechanisms. Additionally, board members particularly independent directors are encouraged to consider not only firm value maximization but also the agency implications of dividend policy when formulating optimal dividend policies.

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