

Examining the Relationship Between Dividend Policy and Market Value Added

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Citation: Fallahzadeh Sheykhanghafshe, T., & Barari Nokashti, S. (2024). Examining the Relationship Between Dividend Policy and Market Value Added. *Business, Marketing, and Finance Open,* 1(1), 85-95.

Received: 31 January 2024 Revised: 20 March 2024 Accepted: 24 March 2024 Published: 30 March 2024



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Abstract: The aim of this study is to examine the relationship between dividend policy and market value added in the Tehran Stock Exchange. To test the research hypotheses, we encountered homoscedasticity, and to estimate the model, the Ordinary Least Squares (OLS) method was used. Additionally, to ensure the absence of multicollinearity among the explanatory variables, the Pearson correlation test was employed. The results of the test indicated that there was no linear or technical correlation among the explanatory variables. Based on the results obtained from the stationarity test, we confirmed the non-spuriousness of the relationships within the regression and the significance of the variables. Furthermore, the normality of the error term was tested, and it was found that the residuals from the model estimation did not follow a normal distribution at the 95% confidence level. However, given the large number of observations, the non-normality of the residual distribution can be disregarded. Moreover, an examination of the residual distribution revealed that it approximates a normal distribution. The results obtained from the implementation of the research models indicated that the first, third, and fourth hypotheses of the study were accepted.

Keywords: Dividend policy, dividend yield ratio, dividend payout ratio, market value added.

1. Introduction

The topic of dividend policy has consistently been one of the most controversial subjects in financial science, capturing the attention of economists over the past five decades. It has been the focus of both comprehensive theoretical modeling and empirical investigations [1]. Dividend distribution is a topic worthy of discussion from two crucial perspectives: on one hand, it affects firms' forthcoming investments by reducing internal resources and increasing the need for external financing; on the

other hand, many shareholders demand cash dividends. Therefore, shareholders aiming to maximize wealth must continuously balance their diverse preferences against profitable investment opportunities. Consequently, dividend decisions made by managers are highly sensitive and significant [2].

In recent years, dividend policy has emerged as a key instrument in corporate financial strategies, garnering significant interest from researchers and financial managers. This policy not only influences a firm's cash flow and capital structure but also sends signals to the market, thereby affecting the firm's market value. One important

indicator for assessing a firm's market value is Market Value Added (MVA), which reflects the difference between the market value of the firm and the capital invested [3].

Various studies have shown that dividend policy can serve as a moderating variable that strengthens the relationship between profitability and market value [4-13]. However, the findings in this area have not always been consistent. Some studies have indicated that in perfect markets, dividend policy has no impact on market value. For example, the Modigliani and Miller theorem posits that in markets free of agency costs, taxes, and asymmetric information, dividend policy is irrelevant and its changes have no effect on firm value [14].

Given the significance of this issue in corporate financial decision-making and its impact on market value, the present study aims to examine the relationship between dividend policy and market value added in companies listed on the Tehran Stock Exchange. Utilizing recent financial data, this study analyzes and evaluates the influence of dividend policy on market value added and seeks to offer strategies to optimize this policy for enhancing firm value. In today's competitive world, financial decisions—especially those concerning dividend policy—are of paramount importance. Dividend policy not only serves as a means of allocating cash resources to shareholders but also acts as a signal to the market about a firm's financial health and future outlook. In reality, dividend distribution can indicate strong performance or a lack of opportunities for reinvestment. This policy also directly influences the company's share price and ultimately its market value added [10, 12, 13, 15].

Dividend policies are among the most critical factors investors consider. Changes in these policies can signal shifts in the firm's future strategies to the market. Specifically, these policies can affect stock prices and, in turn, the company's market value added. Therefore, understanding this relationship assists investors in making more informed decisions.

Financial performance evaluation typically extends beyond profitability, requiring a comprehensive view of financial policies—including dividend policy—and their effect on market value. Hence, exploring the relationship between dividend policy and market value added can serve as a criterion for more accurate assessment of corporate performance.

Corporate financial managers can utilize the findings of this study to design dividend policies that not only safeguard shareholder interests but also positively and optimally influence market value and investment decisions. This research can help managers adopt policies that generate greater value added for the firm.

Despite numerous studies on dividend policies, the relationship between these policies and market value added still requires further exploration across various industries and markets. Understanding this relationship can enhance financial strategies and improve the accuracy of firm evaluations. Many studies, particularly in developing markets such as Iran, have only partially addressed this topic, and this research aims to help bridge that gap.

In markets like the Tehran Stock Exchange, where competition to attract investors is intense, having accurate information about the effect of dividend policy on market value can help companies fine-tune their strategies to generate higher value added and strengthen their market position. Ultimately, examining the relationship between dividend policy and market value added can provide valuable insights for investors, managers, and financial analysts. This study will not only contribute to improved financial decision-making but will also enrich the existing body of knowledge in corporate finance and economics—especially in developing markets such as Iran.

Therefore, through this research, we seek to determine whether there is a significant and positive relationship between dividend policy and market value added. Additionally, we aim to assess whether dividend yield has a significant relationship with market value added.

2. Methodology

A quantitative research design was adopted, utilizing panel data from 715 firm-year observations collected from companies listed on the Tehran Stock Exchange. The study employed Ordinary Least Squares (OLS) regression models to test four hypotheses. Two models were developed: the first examined the impact of dividend yield and dividend payout ratio on market value added, while the second explored their effects on return on assets. Control variables included firm size, financial leverage, firm growth, capital expenditure, return on equity, and intangible assets. Stationarity of the variables was tested using Levin, Lin & Chu (2002), Im, Pesaran & Shin (2003), ADF-Fisher, and PP-Fisher unit root tests. Heteroskedasticity and multicollinearity were assessed through standard statistical diagnostics including Bartlett, Levene, and correlation matrix analyses.

Model for Hypotheses 1 and 2:

 $MVA_it = \alpha 0 + \alpha 1(DY_it) + \alpha 2(Payout_it) + \alpha 3(FS_it) + \alpha 4(LEV_it) + \alpha 5(GF_it) + \alpha 6(LT_it) + \alpha 7(DS_it) + \epsilon_it$ Model for Hypotheses 3 and 4:

 $ROA_{it} = \alpha 0 + \alpha 1(DY_{it}) + \alpha 2(Payout_{it}) + \alpha 3(FS_{it}) + \alpha 4(LEV_{it}) + \alpha 5(CE_{it}) + \varepsilon_{it}$

In the models above:

- MVA_it: Market Value Added of firm *i* in period *t*
- ROA_it: Return on Assets of firm *i* in period *t*
- DY_it: Dividend Yield of firm *i* in period *t*
- Payout_it: Dividend Payout Ratio of firm *i* in period *t*
- FS_it: Firm Size
- LEV_it: Financial Leverage
- CE_it: Capital Expenditure
- GF_it: Firm Growth
- DS_it: Tangible Asset Debt Ratio
- *α*: Intercept and regression coefficients
- ϵ_{it} : Model error term

Control Variables

- **DY (Dividend Yield):** The portion of a company's earnings distributed to shareholders. It contains informational value for investors and is used to evaluate firm performance.
- Payout (Dividend Payout Ratio): The proportion of earnings paid out as dividends.
- **FS (Firm Size):** Measured as the natural logarithm of total company sales.
- LEV (Leverage): Measured as the ratio of total liabilities to total assets.
- **GF (Growth):** Measured by the ratio of market value to the book value of equity.
- DS (Tangible Asset Debt Ratio): The ratio of debt to tangible assets.
- **CE (Capital Expenditure):** Calculated as cash paid for purchasing fixed assets divided by the total assets at the beginning of the period.

Independent Variables

To evaluate dividend policy, which is the independent variable in this study, the following were used:

• **Dividend Yield (DY):** Currently, the most important metric for evaluating institutions is dividend yield. It is the portion of a firm's earnings distributed to shareholders and contains informational value for assessing company performance.

DY_it = DPS_it / P_it

Where:

- DY_it: Dividend Yield of firm *i* in year *t*
- DPS_it: Dividend per Share of firm *i* in year *t*
- P_it: Stock price of firm *i* at the end of year *t*
- **Dividend Payout Ratio (Payout):** This ratio may vary based on the firm's lifecycle (growth or maturity stage) and its overall dividend policy.

Payout_it = DPS_it / EPS_it

Where:

- Payout_it: Dividend Payout Ratio of firm *i* in year *t*
- DPS_it: Dividend per Share of firm *i* in year *t*
- EPS_it: Earnings per Share of firm *i* in year *t*

Dependent Variables

The dependent variable is the potential or hypothesized outcome—also referred to as the response or output variable (Azar & Momeni, 2005)—which is affected by the independent variable. In this study, the dependent variables are Market Value Added (MVA) and Economic Value Added (EVA). Their operational definitions are as follows:

• Market Value Added (MVA): Unlike Economic Value Added, which generally reflects a firm's internal performance, MVA measures external performance.

Market Value Added = Average Market Value of Equity – Average Market Value of Debt

To properly analyze this performance, attention must be given to the positive changes over time, such as yearto-year percentage variation.

Since a researcher may not be able to include all possible variables in a single study, some may be held constant or neutralized—these are called control variables. In this study, five corporate characteristics potentially related to dividend policy were included as control variables:

- **Firm Size:** Total assets of the firm were used as a proxy.
- Profitability: Return on Equity (ROE) was used as a representative measure of profitability.
- **Debt Ratio:** Represents capital structure, calculated by dividing the book value of total debt by the book value of total assets.
- Firm Growth: Measured using the growth rate of total assets.
- **Intangible Assets:** These are identifiable, non-monetary assets without physical substance, held for production, service delivery, leasing, or administrative purposes.

3. Findings and Results

The first step in any statistical analysis and data processing is the calculation of descriptive indicators. In the descriptive statistics section, data were analyzed using central tendency measures such as mean and median, and dispersion indicators including standard deviation, skewness, and kurtosis. The mean represents the average of the data. The median indicates that 50% of the data are below and 50% are above the central value. When the mean and median are close, it suggests symmetry in the data distribution. The standard deviation reflects the degree of dispersion, while skewness measures the asymmetry of the data distribution. The calculation of these indicators is shown in the table below.

It is noteworthy that in the table below, the dependent variable for Hypotheses 1 and 2 (*Market Value Added*) and the dependent variable for Hypotheses 3 and 4 (*Return on Assets*) were normalized using the Johnson transformation method in Minitab software.

		1				
Variable	MVA (Market Value Added)	DY (Dividend Yield)	PAYOUT (Dividend Payout)	FS (Firm Size)	LEV (Leverage)	GROWTH (Firm Growth)
Mean	3761.44	0.09	0.66	13.90	0.55	0.20
Median	441.38	0.08	0.71	13.75	0.57	0.15
Maximum	83963.17	1.61	15.19	18.94	1.00	2.13
Minimum	-5646.09	0.00	0.00	9.61	0.01	-0.50
Std. Deviation	11414.47	0.09	0.74	1.53	0.19	0.26
Skewness	4.45	6.06	12.76	0.53	-0.44	1.95
Kurtosis	24.17	92.73	231.10	3.70	2.62	10.52
Jarque-Bera (Statistic)	15726.20	244287.4	1569565.00	48.68	27.75	2144.15
Jarque-Bera (p- value)	0.00	0.00	0.00	0.00	0.00	0.00

Table 1a. Descriptive Statistics of Research Variables

Table 1b. Continuation of Descriptive Statistics Table for Research Variables

Variable	ROE (Return on Equity)	DS (Intangible Assets)	ROA (Return on Assets)	CE (Capital Expenditure)
Mean	0.28	7.17	0.14	0.14
Median	0.28	7.51	0.12	0.02
Maximum	2.81	17.87	0.63	25.55
Minimum	-1.94	0.00	-0.29	0.00
Std. Deviation	0.29	3.36	0.13	1.30
Skewness	-0.74	-0.68	0.83	15.98
Kurtosis	19.77	3.50	4.35	276.61
Jarque-Bera (Statistic)	8452.70	62.97	137.18	2260730.00
Jarque-Bera (p-value)	0.00	0.00	0.00	0.00

The number of observations for each variable in the models is 715. The mean value of the variable PAYOUT (Dividend Payout) is 0.66, indicating that most data for this variable are concentrated around this point. The median is a measure of central tendency that reflects the condition of the population. As shown in Table 1, the median of the PAYOUT variable is 0.71, meaning that half of the data points are below this value and half are above it.

Dispersion indicators generally assess how data are spread out or how far they deviate from the mean. The skewness coefficient indicates the asymmetry of the frequency distribution curve. A skewness coefficient of zero indicates perfect symmetry; a positive value indicates right skewness, and a negative value indicates left skewness. The skewness coefficient for the PAYOUT variable is positive, indicating right skewness and a tendency of the data toward smaller values.

Kurtosis measures the peakedness of the frequency distribution curve compared to the standard normal distribution. If kurtosis is around zero, the distribution is considered normal in terms of peakedness. A positive kurtosis indicates a more peaked distribution, while a negative value indicates a flatter curve. All variables in this model have positive kurtosis coefficients, suggesting taller-than-normal distributions with data concentrated around the mean.

Test	Levin, Lin & Chu		Im, Pesaran & Shin		ADF-Fisher Chi- square		PP-Fisher Chi- square	
Variable	Statistic	p- value	Statistic	p- value	Statistic	p- value	Statistic	p- value
MVA (Market Value Added)	-18.60	0.00	-3.61	0.00	-	-	386.79	0.00
DY (Dividend Yield)	-698.87	0.00	-55.57	0.00	481.23	0.00	552.33	0.00
PAYOUT (Dividend Payout)	-26.43	0.00	-8.93	0.00	416.09	0.00	502.72	0.00
FS (Firm Size)	-22.65	0.00	-6.41	0.00	385.30	0.00	544.69	0.00
LEV (Leverage)	-15.41	0.00	-4.87	0.00	336.76	0.02	392.88	0.00
GROWTH (Firm Growth)	-23.25	0.00	-6.08	0.00	358.37	0.00	410.81	0.00
ROE (Return on Equity)	-41.87	0.00	-6.30	0.00	366.34	0.00	434.22	0.00
DS (Intangible Assets)	-56.45	0.00	-14.74	0.00	323.28	0.00	353.48	0.00
ROA (Return on Assets)	-83.79	0.00	-7.49	0.00	343.58	0.01	415.52	0.00
CE (Capital Expenditure)	-7909.96	0.00	-776.72	0.00	895.68	0.00	1040.08	0.00

Table 2. Results of Stationarity Tests for Research Variables

To ensure the reliability of the research results, the absence of spurious relationships in the regression, and the significance of the variables, a stationarity test and calculation of the unit root for the variables used in the model were conducted (Table 2). This test was performed using EViews 7 software and employed several methods: Levin, Lin & Chu (2002), Im, Pesaran & Shin (2003), the Augmented Dickey-Fuller Fisher-type test, and the Phillips-Perron Fisher-type test (1994).

In the unit root tests, the null hypothesis indicates the presence of a unit root (i.e., non-stationarity). If the p-value is less than 0.05, the null hypothesis is rejected at the 95% confidence level. Based on the results, the null hypothesis is rejected for all variables, indicating that all variables are stationary across most methods.

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Correlation	MVA	DY	PAYOUT	FS	LEV	GROWTH	ROE	DS
MVA	1							
DY	0.12	1						
PAYOUT	0.12	0.28	1					
FS	0.61	0.11	0.07	1				
LEV	-0.16	-0.24	-0.11	0.16	1			
GROWTH	0.17	0.03	-0.009	0.06	-0.05	1		
ROE	0.31	0.42	0.15	0.10	-0.23	0.24	1	
DS	0.38	0.08	0.11	0.41	0.04	-0.01	0.06	1

 Table 3. Pearson Correlation Matrix Output

Before estimating the model, it is essential to test for multicollinearity among the independent variables. To determine whether there is any correlation among the independent variables, a correlation analysis was conducted using the Pearson correlation coefficient. Table 3 presents the Pearson correlation coefficients among the independent variables. Full results of this test are provided in the appendix of the thesis.

According to the results shown in Table 3, there is no correlation coefficient that is extremely high or low (close to +1 or -1), which could otherwise distort the regression analysis. Therefore, no significant multicollinearity exists among the variables.

Variable	Coefficient	Std. Error	t-Statistic	p-Value
DY (Dividend Yield)	-1.48	0.27	-5.37	0.00
PAYOUT (Dividend Payout)	-0.01	0.03	-0.40	0.68
FS (Firm Size)	0.60	0.05	10.88	0.00
LEV (Leverage)	-1.13	0.25	-4.48	0.00
GROWTH (Firm Growth)	0.09	0.08	1.15	0.24
ROE (Return on Equity)	0.18	0.11	1.60	0.10
DS (Intangible Assets)	0.03	0.01	2.82	0.00
C (Constant)	-7.89	0.77	-10.18	0.00

Table 4. Hypothesis Testing Results

F-statistic: 16.02; Adjusted R-squared: 0.75; p-value (F-statistic): 0.00; Durbin-Watson statistic: 2.15.

As shown in Table 4, the F-statistic is significant at the 5% level (p < 0.05), confirming the overall significance of the fitted regression model and validating the linearity assumption.

Given the insignificance of some control variables in the model, a refined model was estimated after applying a redundant variable test to achieve the best fit.

Variable	Coefficient	Std. Error	t-Statistic	p-Value
DY (Dividend Yield)	-1.37	0.26	-5.11	0.00
PAYOUT (Dividend Payout)	-0.01	0.03	-0.62	0.52
FS (Firm Size)	0.62	0.05	11.67	0.00
LEV (Leverage)	-1.24	0.24	-5.05	0.00
DS (Intangible Assets)	0.03	0.01	2.56	0.01
C (Constant)	-8.11	0.76	-10.54	0.00

Table 5. Refined Model Results for Hypotheses 1 and 2

F-statistic: 16.13; Adjusted R-squared: 0.75; p-value (F-statistic): 0.00; Durbin-Watson statistic: 2.15.

Based on the adjusted R-squared value, the variables in the fitted model collectively explain 75% of the variations in the dependent variable (Market Value Added). The Durbin-Watson statistic of 2.15 indicates the absence of autocorrelation among the residuals.

Summary of Hypothesis Test Results:

- The p-value for the independent variable Dividend Yield (DY) is less than 0.05, and the coefficient is negative. Therefore, a significant negative relationship exists between dividend yield and market value added, and Hypothesis 1 is accepted.
- The p-value for the independent variable Dividend Payout (PAYOUT) is greater than 0.05. Thus, no significant relationship exists between dividend payout and market value added, and Hypothesis 2 is rejected.

Test	p-Value	Statistic	df
Bartlett	0.30	4.82	4
Levene	0.21	1.44	(4,710)
Brown-Forsythe	0.29	1.22	(4,710)

Table 6.	Heteroskedasticity Test	Results
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Homoscedasticity is one of the key assumptions of linear regression, requiring that the disturbance terms (U_it) in the regression equation have constant variance. If this assumption is violated, heteroskedasticity is present.

In this study, the heteroskedasticity test was conducted, and the results are presented in Table 6. According to the p-values, particularly from the Bartlett test (p = 0.30 > 0.05), the assumption of homoscedasticity is confirmed,

	Table 7. Pearson Correlation Matrix Output						
Correlation	ROA	DY	PAYOUT	FS	LEV	CE	
ROA	1						
DY	0.46	1					
PAYOUT	0.16	0.28	1				
FS	0.11	0.11	0.07	1			
LEV	-0.59	-0.24	-0.11	0.16	1		
CE	-0.07	-0.03	-0.02	-0.10	0.00	1	

and thus the use of Ordinary Least Squares (OLS) estimators is valid. Full heteroskedasticity test results are provided in the appendix.

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Before estimating the model, it is necessary to assess the degree of multicollinearity among the independent variables. This was done using Pearson correlation analysis, and Table 7 presents the correlation coefficients.

Based on the results in Table 7, no correlation coefficients were found to be excessively high or low (close to +1 or -1) that could significantly distort the regression outcomes. Thus, it is concluded that no multicollinearity exists among the independent variables.

Variable	Coefficient	Std. Error	t-Statistic	p-Value
DY (Dividend Yield)	1.52	0.25	6.01	0.00
PAYOUT (Dividend Payout)	-0.10	0.02	-3.66	0.00
FS (Firm Size)	0.35	0.04	7.19	0.00
LEV (Leverage)	-3.17	0.23	-13.61	0.00
CE (Capital Expenditure)	0.007	0.01	0.50	0.61
C (Constant)	-3.30	0.72	-4.54	0.00

Table 8. Results of Hypothesis Testing (Hypotheses 3 and 4)

F-statistic: 15.75; Adjusted R-squared: 0.75; p-value (F-statistic): 0.00; Durbin-Watson statistic: 1.68.

As shown in Table 8, the F-statistic is significant at the 5% level (p < 0.05), indicating that the overall regression model is statistically significant and the linearity assumption is accepted.

Given the insignificance of some control variables, a revised model was estimated after removing redundant variables to achieve the best model fit.

Variable	Coefficient	Std. Error	t-Statistic	p-Value
DY (Dividend Yield)	1.51	0.25	6.00	0.00
PAYOUT (Dividend Payout)	-0.10	0.02	-3.67	0.00
FS (Firm Size)	0.35	0.04	7.18	0.00
LEV (Leverage)	-3.16	0.23	-13.62	0.00
C (Constant)	-3.28	0.72	-4.53	0.00

Table 9. Refined Model Results for Hypotheses 3 and 4

F-statistic: 15.88; Adjusted R-squared: 0.75; p-value (F-statistic): 0.00; Durbin-Watson statistic: 1.67.

Based on the adjusted R-squared value, the variables in the model collectively explain 75% of the variation in the dependent variable (Return on Assets). The Durbin-Watson statistic of 1.67 indicates no autocorrelation among the residuals.

Summary of Results for Hypotheses 3 and 4:

• The p-value for the independent variable Dividend Yield (DY) is less than 0.05, and the coefficient is positive. Therefore, there is a significant positive relationship between dividend yield and return on assets, and Hypothesis 3 is accepted.

• The p-value for the independent variable Dividend Payout (PAYOUT) is less than 0.05, and the coefficient is negative. Therefore, there is a significant negative relationship between dividend payout and return on assets, and Hypothesis 4 is accepted.

4. Discussion and Conclusion

Based on the results concerning each hypothesis, the results of each hypothesis are first presented individually, followed by a general conclusion regarding the overall findings of this research.

The results from testing the first and second hypotheses indicate the following:

The significance level of the independent variable dividend yield is less than 0.05, and its coefficient is negative. Therefore, there is a significant negative relationship between dividend yield and market value added, and Hypothesis 1 is accepted.

The significance level of the independent variable dividend payout is greater than 0.05. Hence, there is no significant relationship between dividend payout and market value added, and Hypothesis 2 is rejected.

These results align with the prior findings [1, 4, 5, 7, 11, 13-18].

The results from testing the third and fourth hypotheses indicate the following:

The significance level of the independent variable dividend yield is less than 0.05, and its coefficient is positive. Therefore, there is a significant positive relationship between dividend yield and return on assets, and Hypothesis 3 is accepted.

The significance level of the independent variable dividend payout is less than 0.05, and its coefficient is negative. Therefore, there is a significant negative relationship between dividend payout and return on assets, and Hypothesis 4 is accepted.

These results align with prior findings [14]. After testing each hypothesis individually and drawing conclusions, a general conclusion is presented. During the study period (2012–2016), the researcher concluded that there is a significant relationship between cash dividend distribution and the performance of companies listed on the Tehran Stock Exchange. Based on the results from the four primary hypotheses tested in this study, accounting-based performance indicators demonstrate a stronger correlation with cash dividend distribution than economic-based performance indicators.

The final model of the study was extracted using EViews software, incorporating all control variables. Through multiple stages, the final model variables were selected from among the independent and control variables to achieve the highest coefficient of determination with the dependent variable (dividend distribution). According to the software output, attached in the appendix, the initial stage involves testing correlations among all main and control variables.

In light of the results for Hypotheses 1 and 2, it is recommended that investors seeking cash dividends consider economic indicators such as economic value added (EVA) and market value added (MVA) in their decision-making processes.

Based on the findings from Hypotheses 3 and 4, it is recommended that investors aiming for cash dividend returns, as well as company managers deciding on dividend distribution levels, first prioritize return on assets (ROA), and subsequently consider return on equity (ROE) and operating cash flows. Moreover, variables such as firm size, future growth opportunities, financial leverage, and cash holdings are also crucial factors in the decision-making process.

Authors' Contributions

Authors equally contributed to this article.

Ethical Considerations

All procedures performed in this study were under the ethical standards.

Acknowledgments

Authors thank all participants who participate in this study.

Conflict of Interest

The authors report no conflict of interest.

Funding/Financial Support

According to the authors, this article has no financial support.

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