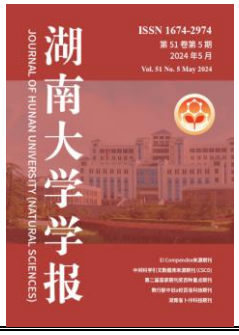

湖南大学学报（自然科学版）
Journal of Hunan University (Natural Sciences)

第 51 卷 第 5 期
2024 年 5 月

Available online at http://jonuns.com/index.php/journal/index

Vol. 51 No. 5
May 2024

Open Access Article

https://doi.org/10.55463/issn.1674-2974.51.5.11

The Effect of Equity Mispricing on the Relationship of Corporate Sustainability Performance and Leverage Adjustments

Masoud Taherinia[1]*, Baharak Tarkhouni[2], Fatemeh Papi[1]

[1] Department of Accounting, Lorestan University, Khoramabad, Iran

[2] Department of Accounting, Payame Noor University, Tehran, Iran

* Corresponding author: taherinia.m@lu.ac.ir

Received: February 17, 2024 / Revised: March 10, 2024 / Accepted: April 9, 2024 / Published: May 30, 2024

Abstract: This study aims to investigate the effect of equity mispricing on the relationship between corporate sustainability performance and leverage adjustments. To achieve this purpose, the number of 178 companies has been studied from 2017 to 2022. The study's hypothesis was tested through a multivariate regression method and panel data method, utilizing Eviews 10. The findings show that corporate sustainability performance has a positive and significant effect on leverage adjustments. Also, equity mispricing has a negative and significant effect on the relationship between corporate sustainability performance and leverage adjustments. Overall, this paper highlights the important role of corporate sustainability performance in shaping corporate capital structure dynamics and suggests implications for corporate strategic planning on the optimal levels of corporate sustainability performance activities. Contrary to previous studies, this research shows that the speed of lever adjustment is heterogeneous among different companies and is determined by various factors. In addition, this study introduces a new essential non-financial element called "firm sustainability performance" that explains cross-sectional changes in the speed of leverage adjustment.

Keywords: leverage adjustments, corporate sustainability performance, equity mispricing.

股权错误定价对企业可持续发展绩效与杠杆调整关系的影响

摘要：本研究旨在调查股权错误定价对企业可持续发展绩效与杠杆调整之间关系的影响。为此，研究了2017年至2022年的178家公司。利用观点10，通过多元回归法和面板数据法检验了研究的假设。研究结果表明，企业可持续发展绩效对杠杆调整具有正向显著影响。此外，股权错误定价对企业可持续发展绩效与杠杆调整之间的关系具有负向显著影响。总体而言，本文强调了企业可持续发展绩效在塑造企业资本结构动态方面的重要作用，并提出了企业战略规划对企业可持续发展绩效活动最佳水平的影响。与以前的研究相反，本研究表明，不同公司的杠杆调整速度是异质的，由各种因素决定。此外，本研究引入了一个新的重要非财务要素，称为“企业可持续发展绩效”，它解释了杠杆调整速度的横截面变化。

关键词：杠杆调整、企业可持续发展表现、股票错误定价。

1. Introduction

Among the massive volume of studies about equity structure, there is a highlighted fact that shows a theoretical consensus that is generally acceptable for a large part of the previous literature. Based on this consensus, companies are constantly adjusting and modifying their capital structure according to various changes that occur in the internal and external environment to provide financial security for the company and maximize its value as well. Companies only adjust their leverage ratios when the benefits of this process outweigh their costs. As a result, companies can be expected to not always operate under the target capital structure, and the issue has been raised regarding the speed of companies moving towards the target lever. Financial leverage has been introduced as a factor that determines the financial ability of the company, and it is believed that financial leverage increases the degree of financial distress in various situations. As the simplest definition suggests, financial leverage means the amount of debt a company incurs to acquire more assets [1].

Adjustment means the action that companies take at the end of the financial year to report the remaining items of the financial statements, and the speed of adjustment is the speed at which companies adjust their capital structure in line with the target and optimal leverage [2].

Companies incur costs because of the leverage adjustment process. Sometimes the costs of adjusting financial leverage are such that companies prefer not to adjust the debt-to-leverage ratio. Therefore, when making a decision about adjusting the debt ratio, companies pay attention to their future costs and benefits and consider the optimal range of capital structure, and this view is based on the "dynamic equilibrium theory". Companies should accordingly, instead of target leverage, imagine an optimal range for this issue in order to overcome the cost-benefit due to the advantages and disadvantages of debt and, as a result, try to achieve the maximum value for the company. In the framework of dynamic equilibrium theory, it can be claimed that the difference between various companies is in the amount of actual leverage adjustment needed to achieve the optimal target, which is presented in the form of a concept called "adjustment speed". Adjustment speed is defined as the ratio of actual lever changes to the optimal target and can be affected by a variety of factors [3]. One of these factors is related to sustainability performance.

Mispricing of companies' stocks in the capital market is considered a phenomenon that arises from capital market deficits. Impacts of investor behavior and information asymmetry are major examples of incomplete market features, which show one of the main influential factors in the misevaluation of assets in the capital market. In fact, corporate stock prices reflect expected future cash flows based on available and obvious information, and hiding or not disclosing important information about the future aspects of the company leads to the misevaluation of companies in the capital market [4]. If the value of equity in the market is overvalued, this condition will reduce the company's cost to issue shares, while if the stock value is undervalued, it leads to higher equity costs. If the cost of issuing shares changes in this way, and if the company exploits or encounters these costs, then the rate at which the company adjusts its target debt ratio will depend on the level of mispricing of the stock [5].

This research contributes to the literature on the dynamic adjustment of capital structures. The previous literature assumed that the speed of leverage adjustments was constant among various firms, but recent literature has provided evidence that shows this issue is heterogeneous and determined by different factors. In addition, we use dynamic partial adjustment models of capital structure to identify factors that determine the speed of adjustment, and this study introduces a new essential non-financial element called "firm sustainability performance," which explains the cross-sectional changes in leverage adjustment speed. It also identifies an underlying economic channel and examines a stock misevaluation mechanism that explains the relationship between firm sustainability performance and the speed of leverage adjustments.

2. Theoretical Foundations

In recent decades, non-financial performance in general and the sustainability of the company in particular have become increasingly important, which has attracted special attention among companies and their stakeholders. Corporate sustainability performance is the extent to which a company simultaneously integrates economic growth, environmental protection, social efficiency, and governance elements into its operations and ultimately determines the impact of these elements on the company and society [6]. Previous literature shows that firm sustainability performance has the potential to create value for companies by increasing financial performance, which can further reduce certain financial constraints [7], company risk [8], and cost of capital [9]. The capital structure literature especially shows that companies are more likely to consider target leverage ratios when issuing new capital [10]. Even if dynamic exchange theory predicts that there are special incentives in companies to adapt to the goal lever by reducing any deviation from those goals [11], companies may decide to temporarily deviate from their target levels due to significant financial frictions in the form of stock issue costs or intermediary costs. In other words, with respect to the cost of rebalancing the lever, moving toward the goal might be slow [12-14].

Numerous studies have examined the effects of firm sustainability performance on firm financial

performance. These studies present conflicting results that show a positive, negative, U-shaped, and even inverse U-shaped relationship between firm sustainability performance and corporate financial performance [15-17]. However, the available and current meta-analysis shows clear evidence that a positive relationship is more likely to occur [15, 18, 19]. For example, in the review of several experimental studies, van Beurden and Gössling [20] show that there is clear evidence for a positive relationship between corporate social and financial performance. They also suggest that studies with conflicting findings use older data. Servaes and Tamayo [21] show that there is a positive relationship between corporate social responsibility and corporate value when customers are highly aware of the company's activities. Similarly, Eccles et al. [18] show that firms with superior social and environmental performance, which are considered to be highly sustainable, perform better with respect to financial matters than firms that are deprived of any explicitly sustainable practices. Flammer [22] examines shareholders' proposals for the firm's sustainability performance, which are generally approved or defeated by a small margin of votes, and finds that approved bids lead to abnormally positive stock returns.

According to Luo and Bhattacharya [23], firm sustainability performance increases customer loyalty and creates greater pricing power.

Cheng et al. [7] showed that firms with stable firm performance are more likely to access financial resources. In a similar vein, El Ghoul et al. [9] showed that firms can benefit from investing in sustainability performance at a lower cost of equity. Dhaliwal et al. [24] showed that companies with high stock costs tend to invest more in various activities for the next year to enjoy the future reduction in their stock costs. Breuer et al. [25] found that in countries with strong investor support, stock costs are reduced when a firm invests in its sustainability performance. El Ghoul et al. [9] concluded that investing in corporate environmental responsibility reduces corporate stock costs worldwide. Bae et al. [26] concluded that firm sustainability performance could reduce high leverage costs by affecting firms' interactions with their customers and competitors. Zhou et al. [27] focused on the sensitivity of equity costs to leverage deviation and suggested that highly sensitive companies adjust more quickly to their target leverage. Ho et al. [28] found that stock liquidity had a significant positive effect on leverage adjustment. In addition, other studies considered mispricing of stock as an element of market timing that had significant effects on leverage adjustments. Warr et al. [29], for example, concluded that mispricing of stock affects the speed of adjusting the leverage ratios in companies, and this particular effect depends on the position of the actual leverage relative to the target level. It has also been shown that corporate decisions have a significant impact on leverage adjustment costs. Warr et al. [29] showed that companies that have leverage above the optimal level and therefore need to issue their stocks, generally adjust to their target faster when their stocks are overvalued. On the other hand, when stocks are undervalued, this speed is much slower. Overall, companies with high levels of performance that are likely to overvalue stocks in the market have lower costs to adjust their leverage, and therefore, in these companies, faster adjustments move toward the target lever can be seen [5].

3. Research Background

Aflatuni et al. [30] conducted a study entitled "The effect of commercial credit on the speed of leverage adjustment" during the years 2006-2018, using data from 143 companies listed on the Tehran Stock Exchange. The results showed that in high-leverage (low-leverage) companies, the leverage adjustment speed is faster (slower) for those business units that have less commercial credit and therefore have higher business credit capacity.

Ho et al. [5] conducted a study entitled "The effect of corporate sustainability performance on leverage adjustments" using 19,434 years of company observations in a large sample of 31 countries from 2002 to 2018. The results showed that companies with superior corporate sustainability tend to adjust more quickly to their target leverage ratios. These results also showed that better corporate sustainability helps companies reduce information asymmetries, increase shareholder participation, increase stock prices in the stock market, and improve competitive advantage in the product market.

Orazali et al. [31] conducted a study entitled "The impact of sustainability performance indicators on financial sustainability: evidence from the Russian oil and gas industry." The results showed that companies improve their sustainability performance indicators to manage risk and improve their financial sustainability. Also, the specific characteristics of a certain company, such as financial capacity, financial leverage, company size, and company age, are important implicit factors affecting the level of financial stress and sustainability.

Gupta [32] conducted a study entitled "Environmental sustainability and implied cost of equity: international evidence" using sample data from 23,301 company-years of observation in 43 countries. The results showed that improving environmentally sustainable performance reduces the cost of capital. Also, the weaker the level of corporate governance of companies, the stronger these results are.

Ray and Ray Chaudhuri [33] conducted a study entitled "The relationship between Business Group Membership and Corporate Sustainability Reporting". The statistical sample of this study included 326 companies-years of observation during 2014 and 2015. The results show that membership in business groups improves the level of sustainability reporting of

companies.

Kuzey and Uyar [34] conducted a study entitled "Determinants of sustainability reporting and its impact on firm value" based on samples taken from 297 Turkish companies listed on the Istanbul Stock Exchange. Findings indicated a growing awareness of the Global Reporting Organization based on sustainability reporting among the companies under review as well as improving the quality of reports.

Gómez-Bezares et al. [35] conducted a study entitled "The Relationship between Sustainability Performance and Corporate Stock Returns" from 2006 to 2012 using data from 350 Spanish companies. The results showed that there is a negative relationship between firm sustainability performance and stock returns. In addition, these results showed that investing in companies with sustainable performance not only increases returns in the survey stages, but also prevents shareholders from losing in later stages.

4. Research Methodology

This research is based on firms listed on the Tehran Stock Exchange in Iran. We begin with an initial sample of 2490 firm-year observations from 2017–2022. The Rahavard software provides the relevant variables. A total of 530 firm-year observations relating to finance, investment, equity trusts, and funds were excluded because of their different practices. Also, financial institutions have distinct requirements to hold cash to meet operating and financing activities, so they were excluded from the sample. Further, we exclude all the firm-year observations when CEO compensation variables were not available. Therefore, the final sample had 825 firm-year observations.

5. Research Hypotheses

1- The company's sustainability performance has a significant effect on leverage adjustments.

2- Stock misevaluation has a significant effect on the relationship between firm sustainability performance and leverage adjustments.

6. Research Variables

6.1. Dependent Variable

The dependent variable of the present study is leverage adjustments (λ).

According to the research of Ho et al. [5] and An et al. [36], the lever adjustment speed through the relations and models is calculated as follows: (Partial adjustment model No. 1, which is the main model for estimating leverage adjustments, is based on the assumption that the adjustment speed is similar in different companies. In order to test the research hypotheses, model (1) is modified).

The target (optimal) lever is not directly measurable and, according to the literature, is considered the ratio determined by the characteristics of the company (X_{it-1}) as model (1):

Model (1): $LEV^*_{it} = \beta X_{it} + \varepsilon_{it}$

Lev^*_{it} - optimal leverage of company i in year t

X_{it} - the characteristics of company i in year t

Company characteristics include firm size, growth opportunities, and capital expenditure ratio.

Firm size (SIZE) - natural logarithm of sales

Growth opportunities (GO) - ratio of market value to book value of company assets

Tangible assets (TA) - property, plant, and equipment divided by the book value of total assets

The characteristics of the company are replaced in Model (2).

Model (2): $LEV^*_{it} = \beta_1 SIZE_{it} + \beta_2 GO_{it} + \beta_3 TA_{it} + \varepsilon_{it}$

$SIZE_{it}$ - the size of company i in year t

GO_{it} - growth opportunity of company i in year t

TA_{it} - tangible assets of company i in year t

Model (3): $ML_{it} - ML_{it-1} = \lambda (LEV^*_{it} - ML_{it-1}) + \varepsilon_{it}$

ML_{it} - the real ratio of the financial leverage of company i in year t

LEV^*_{it} - the optimal leverage ratio of company i in year t

ε_{it} - error component

λ - the average adjustment speed towards the optimal lever

According to the above equation, if λ = 1, the real lever and the optimal lever are equal, and if λ = 0, the real lever and the real lever of the previous year are equal. Therefore, the average adjustment is between $1 \geq \lambda \geq 0$ and the closer this ratio is to one, the greater the gap between the real lever and the optimal lever for the company is.

By substituting model (2) into model (3), model (4) is obtained.

Model (4): $ML_{it} = (1- \lambda) ML_{it-1} + \lambda\beta_1 SIZE_{it} + \lambda\beta_2 GO_{it} + \lambda\beta_3 TA_{it} + \varepsilon_{it}$

According to the research of Ho et al. [28] and An et al. [36], the real lever is calculated as described in Equation (1).

$$ML_{it} = \frac{BD_{it}}{BD_{it} + ME_{it}} \quad (1)$$

ML_{it} - the ratio of financial leverage to market value for company i in year t

BD_{it} - the book value ratio of the debts of Company i in year t

ME_{it} - the market value of the equity of company i in year t

The market value of equity is obtained by multiplying the number of shares by the market value per share.

6.2. Independent Variable

The independent variable of the present study is corporate sustainability performance (CSP).

According to the research of Ho et al. [5], the sustainability performance of the company is a virtual

variable. Therefore, in the case that the disclosure of sustainability performance is well done, it will have a value equal to one, and otherwise it will be equal to zero. In order to extract the indicators of disclosure of sustainable performance, we rely on the activities of the board of directors of the companies and explanatory notes.

On the other hand, according to the research of Sajjadi and Bonabidim [33], the reporting criteria for each dimension are considered in the following order:

Economic Performance (SEP): The amount of investment in research and development as well as investment in environmental deterrents

Social Performance (SSP): The number of working days lost in an accident and the percentage of employees who participate in sustainable development training programs

Environmental Performance (SENP): Costs of dealing with the effects of airflow, energy consumption, use of recycled materials, and the amount of hazardous waste reduction due to material changes.

The level of disclosure of firm sustainability performance is calculated according to the researches of Ho et al. [5] and Orazali et al. [31] as follows: Equations (2), (3), (4) and (5):

$$CSP = SEP + SSP + SENP \quad (2)$$

SUS - corporate sustainability performance

SEP - economic performance

SSP - social performance

SENP - environmental performance

$$\text{Disclosure of company economic performance} = \frac{\text{Total items disclosed in economic terms}}{\text{Total items that can be disclosed in economic terms}} \quad (3)$$

$$\text{Disclosure of company social performance} = \frac{\text{Total items disclosed in social terms}}{\text{Total items that can be disclosed in social terms}} \quad (4)$$

$$\text{Disclosure of company environmental performance} = \frac{\text{Total items disclosed in environmental terms}}{\text{Total items that can be disclosed in environmental terms}} \quad (5)$$

In the above relations, the total disclosed items represent the sum of scores received by each company based on the indicators of the above three sections, and the total number of disclosable items represents the sum of scores received by companies. If the maximum disclosure score received by the companies is more than half, the level of disclosure is close to one and appropriate; otherwise, it is close to zero and the disclosure is poor. Finally, if the maximum score received in equation (6) is higher than the average, the firm's sustainability performance will be one, and if it is lower than the average, it will be zero.

6.3. Moderator Variable

The moderator variable of the present study is stock mispricing.

According to the research of Ho et al. [5], stock mispricing is a virtual variable that, if the company's stock is overvalued, will be equal to one; otherwise, it will be equal to zero. If there is no misevaluation, this ratio will be equal to one. If this ratio is greater than one, it means that the stock price is less than the real value and will be equal to one, and if this ratio is less than one, it means that the stock price is more than the real value and the score will be equal to zero. False stock valuation is measured by the ratio of intrinsic value to stock price (V/P). The intrinsic value of the stock is calculated as described in Equation (6).

$$V_t = \beta_t + \frac{ROE_t - r_e}{1+r_e} * \beta_t + \frac{ROE_{t+1} - r_e}{(1+r_e^2)} * \beta_{t+1} + \frac{ROE_{t+2} - r_e}{(1+r_e^2) * r_e} * \beta_{t+2} \quad (6)$$

V_t - intrinsic value of stocks in year t

B_t - book value of shares at the end of the year t

ROE_t - return on equity at the end of the year t

r_e - the rate of return expected by ordinary shareholders (discount rate), which is calculated using the CAPM model as described in Equation (7).

$$r_e = (r_m - r_f) * \beta_i + r_f \quad (7)$$

r_f - risk-free rate of return (rate of government bonds)

β_i - beta coefficient

r_m - market rate

6.4. Control Variables

The control variables of this research include:

Size (SIZE) - the natural logarithm of the book value of total assets

Tangible assets (TANG) - ratio of property, plant and equipment to the carrying amount of total assets

Profitability (PROF) - ratio of interest before interest, tax, depreciation to book value of total assets

7. Research Model

According to the research of Ho et al. [5], to test the first hypothesis of the research, a regression model based on composite data as described in Model (3) is used.

Model (3): $\lambda_{it} = \beta_0 + \beta_1 CSP_{i,t} + \beta_2 SIZE_{it} + \beta_3 TANG_{it} + \beta_4 PROF_{it} + \varepsilon_{i,t}$

λ_{it} - the speed of adjustment of the leverage for the company i in year t

$CSP_{i,t}$ - sustainability performance of company i in year t

$X_{i,t}$ - company's control variables in year t, which are described in Equation (1)

If the β1 coefficient is significant at the desired confidence level (95%), the first hypothesis of the research is confirmed.

According to the research of Ho et al. [5], to test the second hypothesis of the research, a regression model based on composite data as described in Model (4) is used.

Model (4): $\lambda_{it} = \beta_0 + \beta_1 CSP_{i,t} + \beta_2 EquityM_{i,t} + \beta_3 CSP_{i,t} * EquityM_{i,t} + \beta_4 SIZE_{it} + \beta_5 TANG_{it} + \beta_6 PROF_{it} + \varepsilon_{i,t}$

$EquityM_{i,t}$ - false share evaluation of company i in year t

If the β_3 coefficient is significant at the desired confidence level (95%), the second hypothesis of the

research is confirmed.

8. Research Findings

8.1. Descriptive Statistics

As seen in Table 1, the average lever adjustment speed is 0.429, which indicates that most of the data related to this variable is concentrated around this point. The median of the firm size variable is 14.14, which indicates that half of the data in this variable is less than this value and the other half is greater than it. During the time domain of the research, the highest value of the tangible asset variable is equal to 0.845, and the lowest value of this variable is equal to 0.001. As seen in Table 1, the standard deviation of the variables is not zero, and they meet this condition. In the statistical population, the maximum and minimum values of this parameter are equal to 1.495 and 0.132, which are related to the variables of company size and profitability, respectively.

Table 1 Descriptive statistics of research variables (The authors)

Variable	Symbol	Average	Mean	Max	Min	Sd	Skewness
Lever adjustment speed	Λ	0.429	0.417	0.978	0.038	0.203	0.351
Corporate sustainability performance	CSP	0.530	1	1	0	0.499	-0.128
Share mispricing	EquityM	0.067	0.081	0.911	-0.900	0.154	-0.944
Company size	SIZE	14.33	14.14	19.12	11.30	1.495	0.933
Tangible asset	TANG	0.253	0.215	0.845	0.001	0.177	0.944
Profitability	PROF	0.108	0.090	0.638	0.0008	0.132	0.239

The skewness parameter indicates the degree of asymmetry of the variable frequency curve. If the skewness coefficient is zero, the society is perfectly symmetrical, and if the skewness coefficient is positive, there will be skewering to the right, and if it is negative, there will be skewering to the left. For example, the skewness coefficient of the firm sustainability performance variable is negative and equal to -0.128, which means the frequency curve of this variable in the study population is skewed to the left and deviates from the center of symmetry to such an extent.

8.2. Inferential Analysis of Data

To analyze the data from each of the stated models, it is necessary to test the classical hypotheses of the research model before processing them and testing the hypotheses.

8.2.1. Residual Variance Heterogeneity Test

One of the hypotheses of ordinary least squares (OLS) linear regression is that all residual components have equal variance. To test the assumption of variance heterogeneity in this study, a White test was used, and the results are presented in Table 2.

Table 2 Results of residual variance heterogeneity test (The authors)

Hypothesis H_0	Model	Sig. level	Test statistics	Result	Estimation method
Homogeneity of variance	First	0.0000	4.981	H_0 rejected	GLS
	Second	0.0000	9.147		

The results in Table 2 show the significance level calculated in the White test for models less than the error level of 5%. Therefore, H0 rejects the test of variance matching, which indicates that there is no variance matching, and the method of estimating the studied models is generalized least squares regression (GLS).

8.2.2. Combined Data Type Test

In this study, combined data are gathered, and to determine the type of combined data, the F-Limer and Hausman tests were used, the results of which are shown in Table 3 for research models. To estimate these models, the method of using the data is integrated or tabular. The value of the significance level related to this statistic for research models is less than 5%; therefore, based on these results, the null hypothesis of a test based on data integration is rejected, and the data of research models are estimated as a table. According to the F-Limer test, it is necessary to perform the Hausman test to determine the type of panel data (fixed or random effects). Furthermore, the significance level of this statistic for research models is less than 5%. Therefore, based on these results, the data from the research models is estimated to be constant.

Table 3 Test results to determine the type of composite data (The authors)

Model	F-Limer test			Hausman test		
	Statistic	Sig. Level	Result	Statistics	Sig. Level	Result
First	13.49	0.0000	Panel data	23.33	0.0001	Fixed effect
Second	13.10	0.0000	Panel data	24.30	0.0000	Fixed effect

8.3. Test Results of Research Models

After performing the necessary statistical tests, in order to determine the use of data and ensure the accuracy of the fitted model, the final results of estimating the research models are presented below.

8.3.1. Results of Testing the First Model of Research

In the analysis of the results, we first investigate the significance of the model and the expression of the dependent variable with respect to the independent and control variables, and then, before presenting the main results, the validation of the research model is expressed.

As shown in Table 4, the value of F-Fisher significance in the first and second models is equal to 0.0000. Because this value is less than 0.05, the null

hypothesis is rejected at the 95% confidence level, which means there are significant models. In other words, the studied models are valid. The adjusted coefficient of determination in the first model is 65%; this coefficient indicates that the independent and control variables in these models have the ability to justify more than 65% of the changes in the levels of the dependent variable. In these models, the significance level of Watson's Durbin statistic is equal to 1.90, which indicates that there is no autocorrelation between the residual amounts of the model.

Table 4 Test results of the first model (The authors)

$\lambda_{it} = \beta_0 + \beta_1 CSP_{i,t} + \beta_2 SIZE_{it} + \beta_3 TANG_{it} + \beta_4 PROF_{it} + \varepsilon_{i,t}$

Variable Name	Symbol	Significance Level	T statistic	Sd	Beta Coefficient
Company sustainability performance	CSP	0.0270	2.206	0.007	0.016
Company Size	SIZE	0.0000	6.940	0.010	0.076
Tangible assets	TANG	0.0000	-5.624	0.046	-0.258
Profitability	PROF	0.0000	-18.20	0.033	-0.606
Constant	C	0.0008	-3.361	0.155	-0.521
F Statistic	118.48	Durbin-Watson Test		1.90	
Fisher significance level	0.0000*	Adjusted coefficient of determination		0.65	

The purpose of the first hypothesis of the research is to investigate the effect of firm sustainability performance on leverage adjustments.

As can be seen in Table 4, the calculated probability value for the firm sustainability performance variable is equal to 0.0270, which shows that the relationship between these variables is significant at the 95% confidence level as well as the estimated coefficient. The mentioned variable is equal to 0.016, which shows that the relationship under study is positive and direct. Therefore, considering the level of significance and the estimated coefficient of variability of firm sustainability performance, it can be said that firm sustainability performance has a positive and significant effect on leverage adjustments. Based on these results, the first hypothesis of the research is confirmed.

8.3.2. Results of the Second Model Research Test

As shown in Table 5, the value of F-Fisher significance in the second model is equal to 0.0000. Because this value is less than 0.05, the null hypothesis is rejected at the 95% confidence level, which means there is a significant model. In other words, the model under study is valid. The adjusted coefficient of determination in the second model is 65%; this coefficient indicates that the independent and control variables in these models have the ability to justify more than 65% of the changes in the levels of the dependent variable. In these models, the significance level of Watson's Durbin statistic is equal to 1.95, which indicates the absence of autocorrelation between the residual amounts of the model.

Table 5 Test results of the second model (The authors)

$\lambda_{it} = \beta_0 + \beta_1 CSP_{i,t} + \beta_2 EM_{i,t} + \beta_3 CSP_{i,t} * EM_{i,t} + \beta_4 SIZE_{it} + \beta_5 TANG_{it} + \beta_6 PROF_{it} + \varepsilon_{i,t}$

Variable Name	Symbol	Significance Level	T statistic	Sd	Beta Coefficient
Company sustainability performance	CSP	0.4293	0.790	0.011	0.009
Equity mispricing	EquityM	0.0027	3.013	0.047	0.142
Interactive effect of sustainability performance and stock misevaluation	CSP*EquityM	0.0009	-3.340	0.055	-0.183
Company size	SIZE	0.0000	7.062	0.010	0.074
Tangible assets	TANG	0.0000	-5.468	0.046	-0.253
Profitability	PROF	0.0000	-16.90	0.036	-0.624
Constant	C	0.0000	-3.456	0.147	-0.510
F Statistic	103.95	Durbin-Watson Test		1.95	
Fisher significance level	0.0000*	Adjusted coefficient of determination		0.65	

The purpose of the second hypothesis of the research is to determine the effect of stock misevaluation on the relationship between firm sustainability performance and leverage adjustments.

As can be seen in Table 5, the calculated probability value for the interaction variable of sustainability performance and stock misevaluation is equal to 0.0009, which shows that the relationship between these variables is significant at the 95% confidence level. Also, the estimated coefficient of the mentioned variable is equal to -0.183, which shows that the relationship under study is negative and inverse. Therefore, considering the level of significance and the estimated coefficient of the interaction variable of sustainability performance and stock misevaluation, it can be said that stock misevaluation has a negative and significant effect on the relationship between firm sustainability performance and leverage adjustments. Based on these results, we can confirm the second hypothesis of the research.

9. Conclusion

The present study aimed to determine the effect of stock misevaluation on the relationship between firm sustainability performance and leverage adjustments. Based on the obtained results, the research hypotheses are confirmed.

The results of the first hypothesis of the research show that the company's sustainability performance has a positive and significant effect on leverage adjustments. One of the consequences of voluntary disclosure of non-financial information is the reduction of uncertainty which in turn reduces the need to monitor management activities and consequently reduces financing costs and increases the value of the company. In general, it can be seen that companies with superior sustainability performance have better information transparency or less information asymmetry between themselves and their investors, which reduces the likelihood of agency costs. This, in turn, reduces leverage adjustment costs and speeds up leverage adjustment to the target level. The results of the current study with respect to the first hypothesis are in accordance with the research of Ho et al. [5] and Arshadi [37].

The results of the second hypothesis of the study show that stock misevaluation has a negative and significant effect on the relationship between company sustainability performance and leverage adjustments. If the value of equity in the market is overvalued, the company's cost to issue shares is reduced, while if the value of the stock is undervalued, it leads to higher equity costs. If the cost of issuing shares changes in this way, and if the company exploits or encounters these costs, then the rate at which the company adjusts its target debt ratio depends on the mispricing of the stock. Companies that have leverage above the optimal level and therefore need to publish their shares adjust to their target faster when their shares are overvalued. When stocks are undervalued, this pace is much slower. The results of the current study with respect to the second hypothesis are inconsistent with the studies of Ho et al. [5], Arshadi [37], and Oztekin [38] and inconsistent with the results of Warr et al. [29].

The practical suggestions of this study are: According to the results of the first hypothesis to the Tehran Stock Exchange Organization as the custodian of the capital market and the institution that protects the rights of investors, it is suggested to formulate sufficient regulations and requirements to improve the level of information transparency of companies, discipline and accuracy, disclose information and promote the content of corporate reports. According to the results of the second hypothesis of the research, managers are suggested to use their flexibility to take advantage of mispricing through their internal and external sources in order to ensure the financial security of the company and maximize its value and it is suggested for future researchers to Investigate the effect of stock misevaluation on the relationship between information asymmetry and leverage adjustments and the effect of ownership structure on the relationship between firm sustainability performance and leverage adjustments.

References

[1] GHASEMZADEH E. *Impact of VAT on financial leverage.* Master's thesis, Shams Tabrizi Higher Education Institute, 2019.

[2] ESMAEILPOUR P., ASGARNEZHAD NOURI B., ZAREI G., and BEIGI FIROOZI A. A Comparative Study of Factors Affecting the Speed of Adjustment of Capital Structure among the Industries of the Tehran Stock Exchange. *Journal of Asset Management and Financing*, 2023, 11(1): 101-120. https://doi.org/10.22108/amf.2022.133488.1739

[3] DOLU M., & VANKI A. Deviation of financial leverage from target leverage and equity cost. *Journal of Financial Accounting Knowledge*, 2019, 5(3): 153-181.

[4] CHI J., & GUPTA M. Overvaluation and earnings management. *Journal of Banking and Finance*, 2009, 33(9): 1652-1663. https://doi.org/10.1016/j.jbankfin.2009.03.014

[5] HO L., BAI M., LU Y., and QIN Y. The effect of corporate sustainability performance on leverage adjustments. *The British Accounting Review*, 2021, 53(5): 100989. https://doi.org/10.1016/j.bar.2021.100989

[6] ARTIACH T., LEE D., NELSON D., and WALKER J. The determinants of corporate sustainability performance. *Accounting and Finance*, 2010, 50(1): 31-51. https://doi.org/10.1111/j.1467-629X.2009.00315.x

[7] CHENG B., IOANNOU I., and SERAFEIM G. Corporate social responsibility and access to finance. *Strategic Management Journal*, 2014, 35(1): 1-23. https://doi.org/10.1002/smj.2131

[8] SASSEN R., HINZE A. K., and HARDECK I. Impact of ESG factors on firm risk in Europe. *Journal of Business Economics*, 2016, 86(8): 867-904. https://doi.org/10.1007/s11573-016-0819-3

[9] EL GHOUL S., GUEDHAMI O., KIM H., and PARK K. Corporate environmental responsibility and the cost of capital: International evidence. *Journal of Business Ethics*, 2018, 149(2): 335-361. https://doi.org/10.1007/s10551-015-3005-6

[10] GRAHAM J. R., & HARVEY C. R. The theory and practice of corporate finance: Evidence from the field. *Journal of Financial Economics*, 2001, 60(2): 187-243. https://doi.org/10.1016/S0304-405X(01)00044-7

[11] FRANK M. Z., & GOYAL V. K. Capital structure decisions: Which factors are reliably important? *Financial Management*, 2009, 38(1): 1-37. https://doi.org/10.1111/j.1755-053X.2009.01026.x

[12] FISCHER E. O., HEINKEL R., and ZECHNER J. Dynamic capital structure choice: Theory and tests. *The Journal of Finance*, 1989, 44(1): 19-40. https://doi.org/10.1111/j.1540-6261.1989.tb02402.x

[13] FLANNERY M. J., & RANGAN K. P. Partial adjustment toward target capital structures. *Journal of Financial Economics*, 2006, 79(3): 469-506. https://doi.org/10.1016/j.jfineco.2005.03.004

[14] LEMMON M. L., ROBERTS M. R., and ZENDER J. F. Back to the beginning: Persistence and the cross-section of corporate capital structure. *The Journal of Finance*, 2008,

63(4): 1575-1608. https://doi.org/10.1111/j.1540-6261.2008.01369.x
[15] MARGOLIS J. D., ELFENBEIN H. A., and WALSH J. P. *Does it pay to be good? A meta-analysis and redirection of research on the relationship between corporate social and financial performance*. 2007. https://www.researchgate.net/publication/237455609_Does_it_pay_to_be_good_A_meta-analysis_and_redirection_of_research_on_the_relationship_between_corporate_social_and_financial_performance
[16] YE K., & ZHANG R. Do lenders value corporate social responsibility? Evidence from China. *Journal of Business Ethics*, 2011, 104(2): 197–206. https://doi.org/10.1007/s10551-011-0898-6
[17] RASHIDI M., TAHERINIA M., MOAZENI M., HOSSEINI S., and REZAEEPANAH H. Environmental Sustainability Based on Market Inefficiency and Environment Uncertainty. *Journal of Hunan University Natural Sciences*, 2020, 47(9). http://www.jonuns.com/index.php/journal/article/view/439
[18] ECCLES R. G., KRZUS M. P., ROGERS J., and SERAFEIM G. The Need for Sector-Specific Materiality and Sustainability Reporting Standards. *Journal of Applied Corporate Finance*, 2012, 24(2): 65-71. https://doi.org/10.1111/j.1745-6622.2012.00380.x
[19] ORLITZKY M., SCHMIDT F. L., and RYNES S. L. Corporate social and financial performance: A meta-analysis. *Organization Studies*, 2003, 24(3): 403-441. https://doi.org/10.1177/0170840603024003910
[20] VAN BEURDEN P., & GÖSSLING T. The worth of values – a literature review on the relation between corporate social and financial performance. *Journal of Business Ethics*, 2008, 82: 407-424. https://doi.org/10.1007/s10551-008-9894-x
[21] SERVAES H., & TAMAYO A. The impact of corporate social responsibility on firm value: The role of customer awareness. *Management Science*, 2013, 59(5): 1045-1061. https://doi.org/10.1287/mnsc.1120.1630
[22] FLAMMER C. Does product market competition foster corporate social responsibility? Evidence from trade liberalization. *Strategic Management Journal*, 2015, 36(10): 1469-1485. https://doi.org/10.1002/smj.2307
[23] LUO X., & BHATTACHARYA C. B. The debate over doing good: Corporate social performance, strategic marketing levers, and firm-idiosyncratic risk. *Journal of Marketing*, 2009, 73(6): 198-213. https://doi.org/10.1509/jmkg.73.6.198
[24] DHALIWAL D. S., LI O. Z., TSANG A., and YANG Y. G. Voluntary nonfinancial disclosure and the cost of equity capital: The initiation of corporate social responsibility reporting. *The Accounting Review*, 2011, 86(1): 59-100. https://doi.org/10.2308/accr.00000005
[25] BREUER W., MÜLLER T., ROSENBACH D., and SALZMANN A. Corporate social responsibility, investor protection, and cost of equity: A cross-country comparison. *Journal of Banking & Finance*, 2018, 96: 34-55. https://doi.org/10.1016/j.jbankfin.2018.07.018
[26] BAE K. H., EL GHOUL S., GUEDHAMI O., KWOK C. C., and ZHENG Y. Does corporate social responsibility reduce the costs of high leverage? Evidence from capital structure and product market interactions. *Journal of Banking & Finance*, 2019, 100: 135-150. https://doi.org/10.1016/j.jbankfin.2018.11.007
[27] ZHOU Q., TAN K. J. K., FAFF R., and ZHU Y. Deviation from target capital structure, cost of equity and speed of adjustment. *Journal of Corporate Finance*, 2016, 39: 99-120. https://doi.org/10.1016/j.jcorpfin.2016.06.002
[28] HO L., LU Y., and BAI M. Liquidity and speed of leverage adjustment. *Australian Journal of Management*, 2021, 46(1): 76-109. https://doi.org/10.1177/0312896220918913
[29] WARR R. S., ELLIOTT W. B., KOETER-KANT J., and OZTEKIN O. Equity Mispricing and Leverage Adjustment Costs. *Journal of Financial and Quantitative Analysis*, 2012, 47(3): 589-616. https://doi.org/10.1017/S0022109012000051
[30] AFLATUNI A., TAMJIDI N., and SHAKURI NASAB H. The effect of trade credit on leverage adjustment speed. *Accounting Knowledge*, 2022, 12(3): 29-48. https://doi.org/10.22103/jak.2021.16817.3378
[31] ORAZALI N., MAHMOOD M., and NARBAEV T. The impact of sustainability performance indicators on financial stability: evidence from the Russian oil and gas industry. *Environmental Science and Pollution Research*, 2019, 26: 8157-8168. https://doi.org/10.1007/s11356-019-04325-9
[32] GUPTA K. Environmental sustainability and implied cost of equity: international evidence. *Journal of Business Ethics*, 2019, 147(2): 343-365. https://doi.org/10.1007/s10551-015-2971-z
[33] RAY S., & RAY CHAUDHURI B. Business group affiliation and corporate sustainability strategies of firms: an investigation of firms in India. *Journal of Business Ethics*, 2018, 153(4): 955-976. https://doi.org/10.1007/s10551-018-3917-z
[34] KUZEY C., & UYAR A. Determinants of sustainability reporting and its impact on firm value: evidence from the emerging market of Turkey. *Journal of Cleaner Production*, 2017, 143: 27–39. https://doi.org/10.1016/j.jclepro.2016.12.153
[35] GÓMEZ-BEZARES F., PRZYCHODZEN W., and PRZYCHODZEN J. Corporate Sustainability and Shareholder Wealth—Evidence from British Companies and Lessons from the Crisis. *Sustainability*, 2016, 8(3): 276. https://doi.org/10.3390/su8030276
[36] AN Z., LI D., and YU J. Firm crash risk, information environment, and speed of leverage adjustment. *Journal of Corporate Finance*, 2015, 31: 132–151. https://doi.org/10.1016/j.jcorpfin.2015.01.015
[37] ARSHADI S H. *Investigating the effect of firm sustainability performance on leverage adjustments with emphasis on information asymmetry and mispricing*. Master's thesis, Kordestan University, 2022.
[38] ÖZTEKIN Ö. Capital structure decisions around the world: Which factors are reliably important? *Journal of Financial and Quantitative Analysis*, 2013, 50(3): 301-323. https://doi.org/10.1017/S0022109014000660

参考文:

[1] GHASEMZADEH E. 增值税对财务杠杆的影响。硕士论文，沙姆斯·塔布里兹高等教育学院，2019年。
[2] ESMAEILPOUR P.、ASGARNEZHAD NOURI B.、ZAREI G. 和 BEIGI FIROOZI A. 德黑兰证券交易所各行业资本结构调整速度影响因素比较研究。资产管理与融资杂志，2023年，11(1)：101-

120。https://doi.org/10.22108/amf.2022.133488.1739
[3] DOLU M., & VANKI A. 财务杠杆与目标杠杆和股权成本的偏差。财务会计知识杂志，2019年，5(3)：153-181。
[4] CHI J., & GUPTA M. 估值过高和盈余管理。《银行与金融杂志》，2009年，33(9)：1652-1663。https://doi.org/10.1016/j.jbankfin.2009.03.014
[5] HO L.、BAI M.、LU Y. 和 QIN Y. 企业可持续发展绩效对杠杆调整的影响。《英国会计评论》，2021年，53(5)：100989。https://doi.org/10.1016/j.bar.2021.100989
[6] ARTIACH T.、LEE D.、NELSON D. 和 WALKER J. 企业可持续发展绩效的决定因素。《会计与金融》，2010年，50(1)：31-51。https://doi.org/10.1111/j.1467-629X.2009.00315.x
[7] CHENG B.、IOANNOU I. 和 SERAFEIM G. 企业社会责任与融资渠道。《战略管理杂志》，2014年，35(1)：1-23。https://doi.org/10.1002/smj.2131
[8] SASSEN R.、HINZE A. K. 和 HARDECK I. 环境、社会及管治因素对欧洲企业风险的影响。《商业经济学杂志》，2016年，86(8)：867-904。https://doi.org/10.1007/s11573-016-0819-3
[9] EL GHOUL S.、GUEDHAMI O.、KIM H. 和 PARK K. 企业环境责任与资本成本：国际证据。《商业伦理杂志》，2018年，149(2)：335-361。https://doi.org/10.1007/s10551-015-3005-6
[10] GRAHAM J. R. 和 HARVEY C. R. 公司财务的理论与实践：来自现场的证据。《金融经济学杂志》，2001年，60(2)：187-243。https://doi.org/10.1016/S0304-405X(01)00044-7
[11] FRANK M. Z. 和 GOYAL V. K. 资本结构决策：哪些因素可靠地重要？财务管理，2009年，38(1)：1-37。https://doi.org/10.1111/j.1755-053X.2009.01026.x
[12] FISCHER E. O.、HEINKEL R. 和 ZECHNER J. 动态资本结构选择：理论与检验。金融杂志，1989年，44(1)：19-40。https://doi.org/10.1111/j.1540-6261.1989.tb02402.x
[13] FLANNERY M. J., & RANGAN K. P. 部分调整目标资本结构。金融经济学杂志，2006年，79(3)：469-506。https://doi.org/10.1016/j.jfineco.2005.03.004
[14] LEMMON M. L.、ROBERTS M. R. 和 ZENDER J. F. 回到起点：持久性和公司资本结构的横截面。金融杂志，2008年，63(4)：1575-1608。https://doi.org/10.1111/j.1540-6261.2008.01369.x
[15] MARGOLIS J. D.、ELFENBEIN H. A. 和 WALSH J. P. 做好事有好处吗？企业社会绩效与财务绩效关系研究的荟萃分析与重定向。2007年。https://www.researchgate.net/publication/237455609_Does_it_pay_to_be_good_A_meta-analysis_and_redirection_of_research_on_the_relationship_between_corporate_social_and_financial_performance
[16] YE K. 和 ZHANG R. 贷方重视企业社会责任吗？来自中国的证据。《商业伦理学杂志》，2011年，104(2)：197-206。https://doi.org/10.1007/s10551-011-0898-6
[17] RASHIDI M.、TAHERINIA M.、MOAZENI M.、HOSSEINI S. 和 REZAEEPANAH H. 基于市场低效和环境不确定性的环境可持续性。《湖南大学自然科学学报》，2020年，47(9)。http://www.jonuns.com/index.php/journal/article/view/439
[18] ECCLES R. G.、KRZUS M. P.、ROGERS J. 和 SERAFEIM G. 行业特定实质性和可持续性报告准则的必要性。《应用公司金融杂志》，2012年，24(2)：65-71。https://doi.org/10.1111/j.1745-6622.2012.00380.x
[19] ORLITZKY M.、SCHMIDT F. L. 和 RYNES S. L. 企业社会和财务绩效：荟萃分析。组织研究，2003年，24(3)：403-441。https://doi.org/10.1177/0170840603024003910
[20] VAN BEURDEN P. 和 GÖSSLING T. 价值观的价值——企业社会和财务绩效关系的文献综述。商业伦理杂志，2008年，82：407-424。https://doi.org/10.1007/s10551-008-9894-x
[21] SERVAES H., & TAMAYO A. 企业社会责任对企业价值的影响：客户意识的作用。管理科学，2013，59(5)：1045-1061。https://doi.org/10.1287/mnsc.1120.1630
[22] FLAMMER C. 产品市场竞争会促进企业社会责任吗？贸易自由化的证据。战略管理杂志，2015，36(10)：1469-1485。https://doi.org/10.1002/smj.2307
[23] LUO X., & BHATTACHARYA C. B. 关于做好事的争论：企业社会绩效、战略营销杠杆和企业特有风险。市场营销杂志，2009，73(6)：198-213。https://doi.org/10.1509/jmkg.73.6.198
[24] DHALIWAL D. S.、LI O. Z.、TSANG A. 和 YANG Y. G. 自愿非财务披露和股权资本成本：企业社会责任报告的启动。会计评论，2011年，86(1)：59-100。https://doi.org/10.2308/accr.00000005
[25] BREUER W.、MÜLLER T.、ROSENBACH D. 和 SALZMANN A. 企业社会责任、投资者保护和股权成本：跨国比较。银行与金融杂志，2018年，96：34-55。https://doi.org/10.1016/j.jbankfin.2018.07.018
[26] BAE K. H.、EL GHOUL S.、GUEDHAMI O.、KWOK C. C. 和 ZHENG Y. 企业社会责任是否降低了高杠杆成本？来自资本结构和产品市场互动的证据。银行与金融杂志，2019，100：135-150。https://doi.org/10.1016/j.jbankfin.2018.11.007
[27] ZHOU Q.、TAN K. J. K.、FAFF R. 和 ZHU Y. 偏离目标资本结构、股权成本和调整速度。公司财务杂志，2016，39：99-120。https://doi.org/10.1016/j.jcorpfin.2016.06.002
[28] HO L.、LU Y. 和 BAI M. 流动性和杠杆调整速度。《澳大利亚管理杂志》，2021年，46(1)：76-109。https://doi.org/10.1177/0312896220918913

[29] WARR R. S.、ELLIOTT W. B.、KOETER-KANT J. 和 OZTEKIN O. 股权错误定价和杠杆调整成本。《金融与定量分析杂志》，2012年，47(3)：589-616。https://doi.org/10.1017/S0022109012000051

[30] AFLATUNI A.、TAMJIDI N. 和 SHAKURI NASAB H. 贸易信贷对杠杆调整速度的影响。会计知识，2022，12(3)：29-48。https://doi.org/10.22103/jak.2021.16817.3378

[31] ORAZALI N.、MAHMOOD M. 和 NARBAEV T. 可持续发展绩效指标对金融稳定的影响：来自俄罗斯石油和天然气行业的证据。环境科学与污染研究，2019，26：8157-8168。 https://doi.org/10.1007/s11356-019-04325-9

[32] GUPTA K. 环境可持续性和隐含股权成本：国际证据。《商业伦理杂志》，2019年，147(2)：343-365。https://doi.org/10.1007/s10551-015-2971-z

[33] RAY S. 和 RAY CHAUDHURI B. 企业集团隶属关系和企业可持续发展战略：对印度企业的调查。《商业伦理杂志》，2018年，153(4)：955-976。https://doi.org/10.1007/s10551-018-3917-z

[34] KUZEY C.，& UYAR A. 可持续发展报告的决定因素及其对公司价值的影响：来自土耳其新兴市场的证据。《清洁生产杂志》，2017年，143：27-39。https://doi.org/10.1016/j.jclepro.2016.12.153

[35] GÓMEZ-BEZARES F.、PRZYCHODZEN W. 和 PRZYCHODZEN J. 企业可持续性和股东财富——来自英国公司的证据和危机的教训。可持续发展，2016，8(3)：276。https://doi.org/10.3390/su8030276

[36] AN Z.、LI D. 和 YU J。公司崩盘风险、信息环境和杠杆调整速度。公司财务杂志，2015，31：132–151。https://doi.org/10.1016/j.jcorpfin.2015.01.015

[37] ARSHADI S H. 研究公司可持续发展绩效对杠杆调整的影响，重点关注信息不对称和错误定价。硕士论文，库尔德斯坦大学，2022年。

[38] ÖZTEKIN Ö。全球资本结构决策：哪些因素可靠地重要？金融与定量分析杂志，2013，50(3)：301-323。https://doi.org/10.1017/S0022109014000660