



Investigating the moderating effect of operational risk on the relationship between social responsibility and cost of equity capital in companies listed on Tehran stock exchange

Investigación del efecto moderador del riesgo operativo en la relación entre la responsabilidad social y el costo del capital social en empresas que cotizan en la bolsa de valores de Teherán

Reza Sotoudeh^{1*}, Fereshteh Nami Fard Tehran², Hossein Samet²

¹ Department of Accounting, Nik Shahr Branch, Islamic Azad University, Nik Shahr, Iran.

² Department of Accounting, Zahedan Branch, Islamic Azad University, Zahedan, Iran.

*r.sotoudeh@iauzah.ac.ir

(recibido/received: 05-diciembre-2021; aceptado/accepted: 02-febrero-2022)

ABSTRACT

This study investigates the relationship between social responsibility and cost of equity capital and the moderating effect of operational risk on the mentioned relationship. The study covers a 6-year research period during 2014 to 2019. 146 firms (total of 876 year-firm) are selected as the statistical sample using systematic elimination sampling method. The hypotheses are analyzed using multivariate regression models and panel data methods are also applied. The results indicate there is a significant negative relationship between social responsibility and cost of equity capital. The operational risk has a significant and inverse effect on the relationship between social responsibility and cost of equity capital.

Keywords: Operational Risk, Social Responsibility, Cost of Equity Capital.

RESUMEN

Este estudio investiga la relación entre la responsabilidad social y el costo del capital y el efecto moderador del riesgo operacional sobre dicha relación. El estudio cubre un período de investigación de 6 años entre 2014 y 2019. Se seleccionan 146 empresas (un total de 876 años-empresa) como muestra estadística utilizando el método de muestreo de eliminación sistemática. Las hipótesis se analizan mediante modelos de regresión multivariante y también se aplican métodos de datos de panel. Los resultados indican que existe una relación negativa significativa entre la responsabilidad social y el costo del capital social. El riesgo operacional tiene un efecto significativo e inverso en la relación entre la responsabilidad social y el costo del capital social.

Palabras claves: Riesgo Operacional, Responsabilidad Social, Costo del Capital Social.

1. INTRODUCTION

Corporate social responsibility is one of the most important management issues for companies. The findings indicate there is a strong correlation between corporate social responsibility and corporate

financing costs (Roberts and Gus, 2011; Baker et al, 2018). However, there is inconsistent findings about the effect of corporate social responsibility on cost of equity capital. Researchers have found a negative relationship between corporate social responsibility and cost of equity capital. It can be argued corporate social responsibility is critically important in risk assessment and capital market pricing (Mishra et al., 2011). Corporate social responsibility activities stabilize the supply chain and improve the operating conditions (Zhang et al, 2014). El Ghouli et al (2011) state companies with poor social responsibility have higher risk, making the investors demand more returns. Therefore, corporate social responsibility affects the cost of equity capital by affecting operational risk. Operational risk can be divided into long-term and short-term. Some factors affect long-term business performance (such as consumer loyalty, reputation, supplier relationships), and some factors affect short-term performance (such as employee motivation, risk of prosecution, and investor preference). Long-term performance provides investors more and better information compared to short-term performance; Thus, it effects the demanded return by investor as a compensation risk-taking and cost of equity capital (Chen and Zhang, 2021).

According to what above mentioned, the main purpose of this study is to investigate the moderating effect of operational risk on the relationship between corporate social responsibility and cost of equity capital in companies listed on Tehran Stock Exchange. The present study theoretically and empirically contributes to the literature. First, there is a research gap considering this method variables in Iran. The present study is the first attempt to bridge this gap. Second, there is no consistent findings about the relationship between social responsibility and cost of equity capital. It needs further analysis. Finally, most studies have examined the relationship between social responsibility and other financial and accounting variables or vice versa (the effect of other financial, accounting and financial variables on corporate social responsibility). What clear is cost of equity capital is related to risk level. The next sections are as followed. First the research literature is reviewed and then the methodology and data analysis are presented. In the final section, research conclusions and suggestions are presented.

2. LIETRATURE REVIEW

Corporate social responsibility can reduce company's risk in a number of ways. Many researchers, including Durnev et al (2013) conclude investing in social responsibility activities reduces firm systematic risk and increases firm value by differentiating products. Lou and Bouslah et al (2013), based on resource and stakeholder theories, confirm the key role of corporate social responsibility in reducing systematic and unsystematic risk. Some researchers have also concluded engaging in social responsibility activities increases stakeholder confidence and reduces corporate risk. Corporate social responsibility enhances product pricing by increasing the customer's satisfaction and loyalty and reducing earning volatility risk. It also has positive consequences on firm performance by reducing reputation risk, information asymmetry between the company and outsiders as well as creating a positive public opinion about the company and increasing productivity by motivating employees. (Chen and Zhang, 2021).

Jo and Harjoto (2015) state corporate social responsibility reduces information asymmetry, market risk and transaction costs, and ultimately, the cost of capital. Some researchers have also found that investors in companies with poor social responsibility performance demand more returns as a compensation for their risk taking. Xu et al (2015) argue corporate social responsibility reduces the cost of capital and this effect is more evident during a recession. Wang et al. (2014) also believe corporate social responsibility reduces the cost of financing (bank credit and equity market). Some researchers also find this relationship is very complex and believe that the negative relationship between corporate social responsibility and the cost of capital arises under certain conditions. Müller et al (2018) conclude corporate social responsibility reduces costs occurs when there is strong and complete investor protection. However, researchers such as Slzmn (2017) note the relationship between corporate social responsibility and cost of capital is stronger in countries with institutional collectivism and assertiveness.

Groening, meanwhile, defines positive and negative changes in future interests as a value at risk. Operational risk is not an abstract concept; Rather, it is real, in the sense that it exists independently of our cognition and mentality and threatens us with its undesirable economic consequences. In order to be able to react appropriately to risks, we must adapt our mentality to the existing risks. Therefore, obtaining information and accurate knowledge of risks is essential (Ahangari and Amini, 2019). Proper management affects the company's profitability and risk. Capital management and profitability and their ownership is important because of its impact on profitability and risk and consequently on the value of the company (Abbaspour and Mohammadpour, 2019).

Previous studies have shown social responsibility disclosure effects investor investment decisions. Companies with better social responsibility disclosure perform better. Chen and Zhang (2021) show corporate social responsibility reduces the cost of capital and operational risk. Operational risk also has a mediating effect on the relationship between social responsibility and the cost of capital of Chinese companies. Gómez et al. (2020) also found that there is a direct and significant relationship between social responsibility and corporate economic performance. Garzón et al (2020) report that social responsibility can have a significant effect on the cost of capital of companies in different periods. Yeh et al (2020) find Chinese companies with higher social performance rapidly reduce their capital and debt costs. The capital structure have a significant moderating effect on the relationship between social responsibility and cost of capital in Chinese companies. Hui et al. (2019) prove that corporate earning is affected by several factors, including market risk and corporate operational risks. Ishaq and Hossein (2018) state that financial performance does not have a mediating effect on the relationship between social responsibility and cost of capital. The relationship between social responsibility and cost of capital in Pakistani companies is negative and significant. Rosa et al (2017) find that there is a significant negative relationship between social performance and cost of debt. They also conclude that social responsibility have a positive effect on reducing debt and capital costs. Lou et al (2010) show charitable donations can help increase earning growth in the future. On the other hand, by emphasizing on improving employee well-being, companies can better attract and retain employees' talents and motivations and it leads to better financial performance (Roberts and Dowling, 2002; Banker & Mashrevala, 2007; Edmans, 2011). El Ghouli et al (2011) found that companies with better social responsibility performance in the United States have lower capital costs. In addition, Dhaliwal et al (2011) state that social responsibility disclosure has a negative relationship with the cost of capital in the United States. Faraji et al. (2020) found that social responsibility can increase firm value; However, earnings management can not affect the relationship between social responsibility and corporate stock market value. Mohammadzadeh Saleteh et al (2020) also show that social capital disclosure has a negative and significant effect on cost of capital. Also, the negative effect of social capital on cost of capital is more severe in companies with high information asymmetry. Kurdistani et al (2015) also state that social responsibility disclosure has a positive and significant effect on return on assets, earnings per share and economic value added. Hajiha and Sarfaraz (2014) study also conclude that social responsibility can reduce the cost of equity. Therefore, by increasing the social performance disclosure, managers can reduce return expected by investors (equity costs) and bring lower financing costs for the company.

3. HYPOTHESES DEVELOPMENT

Social responsibility has become one of the main concerns of managers in international companies and has been highly regarded in emerging markets (Vermander, 2014). Research results show there is a high correlation between social responsibility and financing costs in different markets. Social responsibility can increase cost of capital (Attig et al., 2013; Roberts and Gus, 2011; Ye and Zhang, 2011; Baker et al., 2018; Weber, 2018). Some researchers have found that there is a significant negative correlation between social responsibility and cost of capital, which indicates that social responsibility is an important factor of risk pricing in capital markets (El Ghouli et al., 2011). Jo and Harjoto (2015) explain that social responsibility can lead to information asymmetry, reduced market risk, transaction costs, and ultimately cost of capital.

Potin et al. (2014) also found that in companies with less social responsibility, investors need rewards or compensation for additional risk rewards. Xu et al. (2015) also conclude that corporate social responsibility can reduce cost of capital, and this is more pronounced during recession. Chang et al. (2014) also acknowledge corporate social responsibility activities can reduce cost of bank financing. Breuer et al. (2018) found that social responsibility is stronger in reducing corporate costs in countries with investor protection. Matthiesen and Salzman (2017) show that the relationship between social responsibility and cost of capital is stronger in countries with higher levels of human and institutional orientation. Feng et al. (2015) also state social responsibility can reduce cost of European and American companies; But this was not confirmed in the case of Asian countries. According to what mentioned, the first hypothesis of the research is formulated as follows:

Hypothesis 1: There is a relationship between social responsibility and the cost of equity capital.

As it has been widely shown in the research literature, corporate social responsibility can reduce corporate risk in a number of ways (Chen and Zhang, 2021). Albuquerque et al. (2013) pointed out that social responsibility can reduce the systematic risk and increase firm value by differentiating products. Based on stakeholder and resource-based theory, Lou et al. (2009), Bouslah et al. (2013), and Chollet and Sandwidi (2018) acknowledged that social responsibility reduces systematic and unsystematic risks. Some researchers have suggested that increasing corporate social responsibility activities can increase stakeholders' trust and reduce corporate risk. For example, social responsibility activities 1) increases pricing ability by improving customer satisfaction and loyalty and thus reduces sales fluctuations (Ailawadi et al., 2014; Galbreath & Sham, 2012; Sen and Bhattacharya, 2001) ; 2) reduces reputation risk by reducing information asymmetry and positive public opinion (Cui et al., 2018) ; 3) increases employee productivity (Aguilera et al., 2007); 4) Improves the legal risk that reduces employee misconduct (Flammer and Luo, 2017); 5) stabilizes the supply chain and consequently company performance by increasing supplier support (Yawar and Seuring, 2017; Zhang et al., 2014) and Increases investor preference to increase market transactions and asset pricing, leading to a reduction in corporate investment risk (Cox and Wicks, 2011). El Ghouli et al. (2011) argued that companies with less social responsibility experience more risks. This means that social responsibility can affect cost of capital through operational risk. Therefore, operational risk plays an moderating role. Moreover, operational risk can be divided into long-term risk and short-term risk. Some factors can affect company's long-term business operations (such as customer loyalty, reputation, and relationship with suppliers); While some other factors have short-term performance (such as employee incentives, legal risk and investor preference). Compared to the short-term performance of a company's operations, long-term operations can increase investors 'information of the company's risks and ultimately lead to an increase in cost of capital (Chen and Zhang, 2021). With regard to the above, the second hypothesis can be formulated as follows:

Hypothesis 2: Operational risk has a moderating effect on the relationship between corporate social responsibility and cost of equity capital.

4. RESEARCH METHODOLOGY

4.1. Statistical population and sample

The statistical population of this research includes all companies listed on Tehran Stock Exchange since 2014. 146 companies are analyzed during 2014 to 2019. The following framework is respected in selection process:

- Financial companies are excluded because of their different capital structure.
- Companies listed on Tehran Stock Exchange since 2014 are included.
- Companies should not be unlisted for more than 3 months on Stock Exchange.
- Company data is accessible.
- Companies whose fiscal year do not end at 19/03 are included.

- Companies changed their fiscal year during the period 2014-2019 are included

4.2. Regression model Development and variable measurement

The first hypothesis examines the relationship between social responsibility and cost of capital. Following Chen and Zhang (2021), the multivariate linear regression model (1) is applied. If independent variable coefficient (β_1) is significant, it can be concluded that the first hypothesis of the research has not been rejected. Here we have:

$$COE_{it} = \beta_0 + \beta_1 CSR_{it} + \beta_2 SIZE_{it} + \beta_3 BM_{it} + \beta_4 ROE_{it} + \beta_5 DTA_{it} + \beta_6 BETA_{it} + \beta_7 TURNOVER_{it} + \beta_8 RD_{it} + \varepsilon_{it} \quad (1)$$

The second hypothesis tests the moderating effect of operational risk on the relationship between social responsibility and cost of capital. Following Chen and Zhang (2021), a multivariate nonlinear regression model (2) is used. If the coefficient (β_3) is significant, it can be concluded that the second hypothesis of the research is confirmed. Here we have:

$$COE_{it} = \beta_0 + \beta_1 CSR_{it} + \beta_2 OR_{it} + \beta_3 CSR_{it} * OR_{it} + \beta_4 SIZE_{it} + \beta_5 BM_{it} + \beta_6 ROE_{it} + \beta_7 DTA_{it} + \beta_8 BETA_{it} + \beta_9 TURNOVER_{it} + \beta_{10} RD_{it} + \varepsilon_{it} \quad (2)$$

Dependent variable: Cost of capital (COE):

COE index has been used to measure cost of capital, following Valipour et al. (2011) as follows:

$$COE_{it} = K_b * (1 - T_c) * D/V + K_s * S/V \quad (3)$$

$WACC_{it}$: Cost of capital at the end of the fiscal year.

K_b : Loan rate (borrowings), financial cost divided by total debt at the end of fiscal year.

T_c : Tax effect, cost of tax divided by revenue before deducting tax at the end of fiscal year.

D: The book value of loans receivable, short-term and long-term loans at the end of fiscal year.

V: Firm value, total value of debts and equity at the end of fiscal year.

K_s : Adjusted realized rate of return (calculated through new Rahavard software):

$$K_s = \frac{(1 - \alpha) + (P_1 + D) - P_0}{P_0} \quad (4)$$

That:

α : Percentage of capital increase

P_1 : Final price in current year

D: Cash dividend, pre-emptive right received, stock breakdown and dividend per share

P_0 : Final price in previous year

S: Market value of capital provided by shareholders, which is equal to the product

of the market price per share multiplied by the total number of shares issued by the company at the end of fiscal year.

Independent variable: Corporate Social Responsibility (CSR):

Following Hajiha and Sarfaraz (2014) a special model has been used to measure corporate social responsibility. In this model, four dimensions are considered for social responsibility, each of which has indicators that should be examined based on strengths and weaknesses and scores should be considered. If the company complies with any of the specified items is one, and otherwise zero. Finally, for each dimension, the sum of the scores obtained for the strengths is subtracted from the sum of the scores obtained for the weaknesses, and the final score of social responsibility is calculated. Information and data related to corporate social responsibility are provided in the section of detailed management reports related to corporate financial reporting. The model is measured following KLD, which ranks organizations every year based on social and environmental criteria. These indicators are as follows:

$$CSR = COM + EMP + ENV + PRO$$

This model is summarized as follows:

Table 1. Components of corporate social responsibility

weakness	Strengths	Class
<ul style="list-style-type: none"> ▪ Negative economic effect (negative effect on life quality , factory closure); ▪ Non-payment of taxes; 	<ul style="list-style-type: none"> ▪ Charitable donations; ▪ Innovative contributions (assistance to non-profit organizations, participation in public projects); 	<i>COM</i>
<ul style="list-style-type: none"> ▪ Poor health and safety; ▪ Labor force reduction; 	<ul style="list-style-type: none"> ▪ Cash profit sharing; ▪ Retirement benefits; 	<i>EMP</i>
<ul style="list-style-type: none"> ▪ Production of hazardous waste, ▪ Fines for waste management violation; 	<ul style="list-style-type: none"> ▪ Clean energy (use of fuel with less pollution); ▪ Control of air pollution and reduction of greenhouse gases) ; 	<i>ENV</i>
<ul style="list-style-type: none"> ▪ Fines for product unsafety ; ▪ Fines for negative advertising; 	<ul style="list-style-type: none"> ▪ Product quality; ▪ Product safety; 	<i>PRO</i>

Modifier variable:

Operational risk (OR):

Since this study examines operational risk (including production, sales and investment risk) instead of stock market risk, earning volatility index is used to measure operational risk (Chen and Zhang, 2021). Therefore, this variable is measured based on fluctuations in asset returns (operating profit to total assets ratio) over the past three years.

Control variables:

Following Chen and Zhang (2021), the effect of some financial and accounting variables on regression models is controlled as follows:

- Company size (SIZE): Natural logarithm of total assets at the end of fiscal year.
- Book to market value (BM): Book to market ratio (number of shares multiplied by share price) at the end of faisal year.
- Profitability (ROE): Net profit to total value at the end of fiscal year.
- Financial Leverage (DTA): Total liabilities to total assets ratio at the end of fiscal year.
- Beta coefficient (BETA): Beta coefficient (systematic risk) at the end of fiscal year. Capital asset pricing model is used to measure Beta coefficient.
- Turnover (TURNOVER): The average daily turnover (turnover to total share ratio) at the end of fiscal year.
- R&D Costs (RD): R&D costs to total share holdings at the end of fiscal year.

5. RESEARCH DATA ANALYSIS

Descriptive Statistics:

Descriptive statistics includes a set of methods for collecting, summarizing, classifying, and describing numerical facts. Some concepts of descriptive statistics include mean, median, minimum, maximum, and standard deviation, which are listed in Table (2). The total number of sample is 146 companies during 2014 to 2019 (total of 876 years-firms). Descriptive results show the mentioned variable mean is 4%, which reaches 97%. Its minimum is -15%. Corporate social responsibility has the mean of 1.8, the max of which is 6 and the min is -1, which indicates that the company is weak in social responsibility. Meanwhile, the mean operational risk is 4%, the highmacest of which is 23% and the min is 0.0005%. But the findings related to the control variables show that the size mean is 14 and the largest and smallest

companies have sizes of 20 and 11, respectively. The book value of dividends is 39% of the corporate stock market value, the max of which is 99%. Profitability shows that companies during the review period had an average profitability of 25% of their total equity, which has reached more than 85%. Minimum profitability is -82% and indicates the loss. Financial leverage also shows that companies owe 53% of their total assets, with the max of being more than 98%, indicating the company has a high risk. The average beta of companies, which also indicates systematic risk, is 72%. The turnover is 95%, the max of which is more than 4.9 times. Finally, corporate research and development costs are 0.001% of total corporate balance sheet assets, the max of which is more than 15%. Here we have:

Table 2. Descriptive statistics of research variables

Standard deviation	Minimum	Maximum	Median	Mean	Symbol	Variable
0.109879	-0.151900	0.977735	0.012347	0.042685	COE	Cost of Capital
1.590932	-3.000000	6.000000	2.000000	1.892936	CSR	Corporate social responsibility
0.036810	0.000555	0.232023	0.037191	0.046526	OR	operational risk
1.513387	11.11602	20.18339	14.39877	14.54501	SIZE	size
0.222663	0.006517	0.993655	0.368237	0.390974	BM	Book to market
0.238782	-0.823682	0.852867	0.237657	0.252702	ROE	Profitability
0.190706	0.012733	0.986760	0.545933	0.536939	DTA	Financial Leverage
0.976879	-3.930465	5.484769	0.637539	0.728827	BETA	Beta coefficient
1.142282	0.000696	4.972013	0.473681	0.959050	TURNOVER	Stock turnover
0.010157	0.000000	0.175412	0.000000	0.001005	RD	R&D costs

Regression model estimation (first hypothesis):

Chow test (F Limer) is used to specify the estimation method (combined or panel). Combined data method is used for observations whose test level is more than 5% or in other words their test statistic is less than the table statistic. Panel data method is used for observations whose probability is less than 5%. In addition, panel data method can be performed using two models of random effects and fixed effects. The Hausman test is used to determine which model to be used. Fixed effects model is used for observations with a probability of less than 5%, and random effects model for observations with a probability of more than 5%. The results are shown in Table (3).

Table 3. Chaw and Hausman test results

Result	Significance level	Degrees of freedom	Test statistics	Test
Panel (the Panel)	0.0003	(145,747)	1.505658	Chow (F Limer)
Fixed effects	0.0000	8	72.840882	Hausman

Model fitting tests:

Adjusted determination coefficient is used to evaluate the goodness of the model and the significance of the model is evaluated using F-statistic. Also, the independence and heteroscedasticity (Bruch-Pagan test) of the error components are measured. Finally, the variance inflation (VIF) test is used to investigate the lack of colinearity between the independent and control variables. The results indicate the adjusted coefficient of determination is equal to 0.35, which means that the explanatory power and model fitness are at a good level. F statistic is 9.81 and the probability is 0.000. Since probability value is less than 0.05, the significance of the model is confirmed. Finally, since variance inflation is less than 10, it is accepted as a result of the lack of co-linearity between the research variables. Here we have:

$$COE_{it} = \beta_0 + \beta_1 CSR_{it} + \beta_2 SIZE_{it} + \beta_3 BM_{it} + \beta_4 ROE_{it} + \beta_5 DTA_{it} + \beta_6 BETA_{it} + \beta_7 TURNOVER_{it} + \beta_8 RD_{it} + \varepsilon_{it}$$

Table 4. Results regression model estimation for the first hypothesis:

variance inflation	Significance	T student	Beta	symbol	Variable
-	0.0005	3.484550	0.224425	C	Fixed value
1.018686	0.0005	-3.483994	-0.012323	CSR	Corporate social responsibility
1.451354	0.0000	4.401505	0.019534	SIZE	Size
1.048125	0.0000	-21.83893	-0.442456	BM	Book to market
1.097604	0.0014	-3.198642	-0.028914	ROE	Profitability
1.111095	0.0000	-15.69616	-0.483688	DTA	Financial Leverage
1.043749	0.0000	4.810426	0.028048	BETA	Beta coefficient
1.463560	0.0001	-3.884247	-0.370530	TURNOVER	Stock turnover
1.018158	0.4159	0.813605	0.450633	RD	R&D costs
0.353950				Adjusted coefficient of determination	
9.810415				F Statistics	
0.000000				Significance level	
2.029963				Durbin- Watson	
5.506216				Bruce-Pagan Statistics	
0.9389				Significance level	

The significance level of independent variable of corporate social responsibility (CSR) is less than 5% error, which shows that there is a significant relationship between social responsibility and cost of capital in companies listed on Tehran Stock Exchange. In addition, the coefficient obtained for the independent variable of corporate social responsibility is negative, which indicates that with increasing social responsibility, cost of capital has decreased (confirming the first hypothesis of the research). In addition, the results obtained for the control variables show that there is a positive and significant relationship between firm size and beta coefficient with firm capital cost and there is a negative and significant relationship between book to market, profitability, financial leverage and stock turnover with capital cost.

In addition, there is no relationship between research and development costs and cost of capital
Regression model estimation (second hypothesis):

Chow test (F Limer) is used to specify the estimation method (combined or panel). Combined data method is used for observations whose test level is more than 5% or in other words their test statistic is less than the table statistic. Panel data method is used for observations whose probability is less than 5%. In addition, panel data method can be performed using two models of random effects and fixed effects. The Hausman test is used to determine which model to be used. Fixed effects model is used for observations with a probability of less than 5%, and random effects model for observations with a probability of more than 5%. The results are shown in Table (5).

Table 5. Chaw and Hausman test results

Result	Significance level	Degrees of freedom	Test statistics	Test
Panel (the Panel)	0.0004	(145,745)	1.491436	Chow (F Limer)
Fixed effects	0.0000	10	73.359426	Hausman

Model fitting tests:

Adjusted determination coefficient is used to evaluate the goodness of the model and the significance of the model is evaluated using F-statistic. Also, the independence and heteroscedasticity (Bruch-Pagan test)

of the error components are measured. Finally, the variance inflation (VIF) test is used to investigate the lack of colinearity between the independent and control variables. The results indicate the adjusted coefficient of determination is equal to 0.35, which means that the explanatory power and model fitness are at a good level. F statistic is 9.81 and the probability is 0.000. Since probability value is less than 0.05, the significance of the model is confirmed. Finally, since variance inflation is less than 10, it is accepted as a result of the lack of co-linearity between the research variables. Here we have:

Table 6. Results regression model estimation for the second hypothesis:

$COE_{it} = \beta_0 + \beta_1 CSR_{it} + \beta_2 OR_{it} + \beta_3 CSR_{it} * OR_{it} + \beta_4 SIZE_{it} + \beta_5 BM_{it} + \beta_6 ROE_{it} + \beta_7 DTA_{it} + \beta_8 BETA_{it} + \beta_9 TURNOVER_{it} + \beta_{10} RD_{it} + \varepsilon_{it}$					
variance inflation	Significance	T student	Beta	symbol	Variable
-	0.0003	3.606209	0.238146	C	Fixed value
2.710002	0.0001	-4.008207	-0.023104	CSR	Corporate social responsibility
1.923202	0.0415	2.043648	0.579408	OR	operational risk
3.291597	0.0080	-2.651299	-0.227616	CSR*OR	corporate social responsibility* operational risk
1.457089	0.0000	4.634584	0.020592	SIZE	size
1.088658	0.0000	-22.18897	-0.457783	BM	Book to market
1.099382	0.0008	-3.339808	-0.030190	ROE	Profitability
1.158729	0.0000	-16.26894	-0.511553	DTA	Financial Leverage
1.047957	0.0000	4.856053	0.028348	BETA	Beta coefficient
1.464193	0.0001	-3.971343	-0.378609	TURNOVER	Stock turnover
1.018231	0.4369	0.777398	0.430241	RD	R&D costs
0.361814	Adjusted coefficient of determination				
9.784584	F Statistics				
0.000000	Significance level				
2.029855	Durbin-Watson				
14.01801	Bruce-Pagan Statistics				
0.1722	Significance level				

The significance level of modifier variable of corporate social responsibility* operational risk (CSR*OR) is less than 5% error, which shows operational risk effects the relationship between social responsibility and cost of capital in companies listed on Tehran Stock Exchange. In addition, the coefficient obtained for the modifier variable of corporate social responsibility* operational risk is negative, which indicates that operational risk has an inverse effect on the relationship between social responsibility, and cost of capital (confirming the second hypothesis of the research).

In addition, the results obtained for the control variables show that there is a positive and significant relationship between firm size and beta coefficient with firm capital cost and there is a negative and significant relationship between book to market, profitability, financial leverage and stock turnover with capital cost. In addition, there is no relationship between research and development costs and cost of capital.

6. CONCLUSION AND SUGGESTIONS

The first hypothesis examines the relationship between social responsibility and cost of capital of companies listed on Tehran Stock Exchange. The findings show that with increasing social responsibility, cost of capital has decreased. It should be noted that corporate social responsibility can adversely affect corporate capital cost in a number of ways. First, companies with higher disclosure in social responsibility fulfill their social obligations to various communities (including investors, customers, financiers, creditors, etc.) and as a result they can create a positive attitude towards financial reporting activities in these

groups. This issue is especially considered by financiers and it facilitates companies' access to external financing and reduces its costs. Second, increasing social responsibility means creating a better work environment in the company, this benefits both production and employees. As a result, it is associated with increasing efficiency and improving production and services, which can also lead to a positive attitude in employees and consumers. Finally, social responsibility can reduce information asymmetry, which is considered positive from a capital market perspective; Because it leads to better and more accurate forecasting of companies' activities. As a result, all of these factors can reduce various costs, including the cost of corporate capital. Thus, policy makers and decision-making institutions are suggested to lay the necessary groundwork for social responsibility disclosure in companies. Expanding the education and culture of sustainable social performance in Iranian companies and creating the necessary incentives and motivations in companies along with the development of appropriate requirements and regulations by relevant institutions (including Securities Exchange Organization) and institutions active in the social and cultural spheres to meet the expectations of society are among what should be considered. These findings are consistent with Mohammadzadeh Saleteh et al. (2020), Norouzi et al. (2015), Abdoli et al. (2015), Hajiha and Sarfaraz (2014), Chen and Zhang (2021), Garzón et al. 2020), Ye et al. (2020), Ishaq and Hussein (2018) and Dhaliwal et al. (2014).

The second hypothesis investigates the moderating effect of operational risk on the relationship between social responsibility and capital cost of capital in companies listed on Tehran Stock Exchange. The results indicate operational risk has an inverse effect on the relationship between social responsibility and cost of capital. It should be noted that like the first hypothesis, corporate social responsibility can reduce firm risk in various ways. Social responsibility can reduce systematic risk and increase firm value by differentiating products. Social responsibility can reduce information asymmetry and increase the outsider's access to information. Social responsibility activities can increase stakeholders' trust and reduce the companies' risk. Thus, it can be assumed that companies with less social responsibility experience more risks. This means that social responsibility can affect cost of capital through operational risk. Therefore, operational risk plays an moderating role in this relationship. Therefore, it is suggested that investors, analysts and all capital market participants pay special attention to the role of operational risk and its impact on this relationship when examining the relationship between social responsibility and the cost of capital. The findings of the second research hypothesis are consistent with the results of Chen and Zhang (2021).

RESERENCES

- Abbaspour, Saeed. Rahmatollah Mohammadi-Pour. (2019). Investigating the feasibility of risk-based internal audit system in Islamic Azad University of Iran. *Quarterly Journal of Financial Accounting and Auditing Research*. 11 (41): 262-229.
- Abdoli, Mohammad Reza. Heidarizad, Mohsen. (2017). Corporate Social Responsibility Disclosure and Corporate Capital Costs: The Role of Shareholder Orientation and Financial Transparency. *New Research in Management and Accounting Summer*. 17(26): 120-99.
- Aguilera, R. V. Rupp, D. E. Williams, C. A. Ganapathi, J. (2007). Putting the S Back in Corporate Social Responsibility: A Multilevel Theory of Social Change in Organizations. *Academy of Management Review*. 32 (3): 836-863.
- Ahangari, Mahnaz. Amini, Seyed Abbas. (2019). Study of the effect of operational risk on profitability, ownership and managerial short-sightedness in large and small companies. *Quarterly Journal of New Applied Studies in Management, Economics and Accounting*. 2(3): 15-1.
- Ailawadi, K. L. Neslin, S. A. Luan, Y. J. and Taylor, G. A. (2014). Does Retailer CSR Enhance Behavioral Loyalty? A Case for Benefit Segmentation. *International Journal of Research in Marketing*. 31 (2): 156-167.

- Albuquerque, R., Durnev, A., and Koskinen, Y. (2013). Corporate Social Responsibility and Firm Risk: Theory and Empirical Evidence. *CEPR Discussion Papers*. 21(2): 265-365.
- Attig, N. Ghoul, S. E. Guedhami, O. Suh, J. (2013). Corporate Social Responsibility and Credit Ratings. *Journal of Business Ethics*. 117 (4): 679-694.
- Baker, M. P. Bergstresser, D. Serafeim, G. and Wurgler, J. (2018). Financing the Response to Climate Change: The Pricing and Ownership of U.S. Green Bonds. *National Bureau of Economic Research*. 11(3): 456-521.
- Banker, R.D. Mashruwala, R. (2007). The Moderating Role of Competition in the Relationship between Nonfinancial Measures and Future Financial Performance. *Contemp. Account. Res.* 24 (3): 763–793.
- Bouslah, K. Kryzanowski, L. M'zali, B. (2013). The Impact of the Dimensions of Social Performance on Firm Risk. *Journal of Banking and Finance*. 37 (4):1258-1273.
- Breuer, W. Müller, T. Rosenbach, D. Salzmann, A. (2018). Corporate Social Responsibility, Investor Protection, and Cost of Equity: A Crosscountry Comparison. *Journal of Banking and Finance*. 96(4): 34-55.
- Chang, Y. Hsieh, C. H. Wang, T. C. Hsieh, T. Y. (2014). Corporate Social Responsibility, Cost of Equity and Cost of Bank Loans (Vol. 6). *International Review of Accounting, Banking and Finance*. 22(6): 258-147.
- Chen Bo. Aojie Zhang (2021). How Does Corporate Social Responsibility Affect the Cost of Equity Capital through Operating Risk?. 14(3): 47-89.
- Chollet, P. Sandwidi, B. W. (2018). CSR Engagement and Financial Risk: A Virtuous Circle? *International Evidence. Global Finance Journal*. 38(2): 65-81.
- Cox, P. Wicks, P. G. (2011). Institutional Interest in Corporate Responsibility: Portfolio Evidence and Ethical Explanation. *Journal of Business Ethics*. 10(1)143-165.
- Cui, Jinhua. Hoje, Jo. Haejung, Na. (2018). Does Corporate Social Responsibility Affect Information Asymmetry?. *Journal of Business Ethics*. 148 (2): 549–572.
- Dhaliwal, D. S. Li, O. Z. Tsang, A. Yang, Y. G. (2011). Voluntary Nonfinancial Disclosure and the Cost of Equity Capital: The Initiation of Corporate Social Responsibility Reporting. *The Accounting Review*. 86 (1): 59–100.
- Durnev, A. Albuquerque, R. Koskinen, Y. (2013). Corporate Social Responsibility and Firm Risk: Theory and Empirical Evidence. *CEPR Discussion Papers*. 15(7): 423-374.
- Edmans, A. (2011). Does the stock market fully value intangibles? Employee satisfaction and equity prices. *Journal of Financial Economics*. 101(8): 621–640.
- El Ghoul, S. Guedhami, O. Kwok, C. C. Mishra, D. R. (2011). Does Corporate Social Responsibility Affect the Cost of Capital?. *Journal of Banking and Finance*. 35 (9): 2388-2406
- Faraji, Omid. Jannati, daryakenari. Fateme, Mansouri Kefsan. Younesi Moti, Fatemeh. (2020). Corporate Social Responsibility and Firm Value: The Mediating Role of Earnings Management. *Social Capital Management*. 7 (1): 58-25.
- Feng, Z. Y. Wang, M. L. Huang, H. W. (2015). Equity Financing and Social Responsibility: Further International Evidence. *The International Journal of Accounting*, 50 (3): 247-280.
- Flammer, C. Luo, J. (2017). Corporate social responsibility as an employee governance tool: Evidence from a quasi-experiment. *Strategic Management Journal*. 38(2): 163-183
- Galbreath, J., and Shum, P. (2012). Do Customer Satisfaction and Reputation Mediate the CSReFP Link?. Evidence from Australia. *Australian Journal of Management*. 37 (2): 211-229.

Garzón-Jiménez, Renato. Ana, Zorio-Grima. (2020). Corporate Social Responsibility and Cost of Equity: Literature Review and Suggestions for Future Research. *J. Bus. Account. Financ. Perspect.* 2 (3): 15-1.

Gómez, Juan Diego. Alzate, Diógenes. Lagos Cortés. Percy, Marquina Fieldman. (2020). Corporate Social Responsibility Practices and Economic Performance in Colombia: The Moderating Effect of Family Control. *International Journal of Economics and Financial Issues.* 10 (1): 6-18.

Hajiha, Zohre. Sarfaraz, Bahman. (2014). Study of the relationship between corporate social responsibility and equity costs in companies listed on the Tehran Stock Exchange. *Empirical Accounting Research.* 4 (14): 123-105.

Hui, Kam Yan. Jane Sarah. (2019). Market Risk and Operational Risk Towards Company's Profitability. 29(20): 159-247.

ISHAQ, Muhammad. Ch. Mazhar HUSSAIN. (2018). CORPORATE SOCIAL RESPONSIBILITY AND COST OF EQUITY: Mediating Role of Financial Performance. *Pakistan Journal of Applied Economics: Special Issue.* 15(6): 211-255.

Jo, H. Harjoto, M. A. (2015). Legal vs. Normative CSR: Differential Impact on Analyst Dispersion, Stock Return Volatility, Cost of Capital, and Firm Value. *Journal of Business Ethics.* 128 (1): 1-20.

Kurdistani, Gholamreza. Qaderzadeh, Seyed Karim. Haghghat, Hamid. (2015) "The Impact of Social Responsibility Disclosure on Accounting and Economic Criteria and Corporate Performance Evaluation Market". *Accounting Advances.* 10(1): 210-181.

Lou, X. Bhattacharya, C. B. (2010). The Debate over Doing Good: Corporate Social Performance, Strategic Marketing Levers, and Firm-idiosyncratic Risk. *Journal of Marketing.* 73 (6): 198-213.

Luo, X. Bhattacharya, C. B. (2009). The debate over doing good: Corporate social performance, strategic marketing levers, and firm-idiosyncratic risk. *Journal of Marketing.* 73(6): 198-213

Matthiesen, M. L. Salzmann, A. J. (2017). Corporate Social Responsibility and Firms' Cost of Equity: How Does Culture Matter?. *Cross Cultural and Strategic Management.* 24 (1): 105-124.

Mishra, Dev R. Sadok, El Ghouli. Omran, Guedhami. Chuk C. Y. Kwok. (2011). Does Corporate Social Responsibility Affect the Cost of Capital?. *Journal of Banking and Finance.* 35(9): 2388- 2406.

Mohammadzadeh Saletah, Haidar. Abyazi, Eisa. Mohabelipour, Mehdi. (2020). The effect of social capital on cost of capital with emphasis on information asymmetry. *Financial Accounting and Auditing Research.* 12 (46): 231-203.

Müller, R. D. Wang, G. X. Liu, G. Cui, C. C. (2018). The Effect of Corporate Social Responsibility on Cost Reduction. *Journal of Business Ethics.* 100 (5): 765-578

Norouzi, Mohammad. Shahabi, Maryam. (2015). Investigating the Impact of Corporate Social Responsibility Disclosure on Capital Costs: Evidence from Tehran Stock Exchange. *National Conference on New Research Achievements in Accounting and Management.* 4 (2): 116-58.

Potin -Girerd, I. Jimenez-Garces, S. Louvet, P. (2014). Which dimensions of social responsibility concern financial investors?. *Journal of Business Ethics.* 121(4): 559-576.

Roberts, G. S. Goss, A., (2011). The Impact of Corporate Social Responsibility on the Cost of Bank Loans. *Journal of Banking and Finance.* 35 (7): 1794-1810.

Roberts, P.W. Dowling, G.R. (2002). Corporate Reputation and Sustained Superior Financial Performance. *Strateg. Manage. J.* 23(2): 1077–1093.

- Rosa, Fabio La. Giovanni, Liberatore. Francesco, Mazzi. Simone, Terzani. (2017). The impact of corporate social performance on the cost of debt and access to debt financing for listed European non-financial firms. *European Management Journal* (17): 1-11.
- Sen, S. Bhattacharya, C. B. (2001). Does Doing Good always lead to Doing Better? Consumer Reactions to Corporate Social Responsibility. *Journal of Marketing Research*. 38 (2): 225-243.
- Slzmn, N. C. (2017). The Relationship between Corporate Social Responsibility and the Cost of Capital, *Journal of Business Ethics*. 112 (3): 789-456.
- Vermander, B. (2014). Corporate Social Responsibility in China: A vision, an Assessment and a Blueprint. *World Scientific*. 110(4): 456-685.
- Wang, T. C. Chang, Y. Hsieh, C. H. Hsieh, T. Y. (2014). Corporate Social Responsibility Cost of Equity and Cost of Bank Loans. *International Review of Accounting, Banking and Finance*. 6(5): 259-368.
- Weber, J. L. (2018). Corporate Social Responsibility Disclosure Level, External Assurance and Cost of Equity Capital. *Journal of Financial Reporting and Accounting*. 16 (4): 694-724.
- Xu, S., Liu, D. Huang, J. (2015). Corporate Social Responsibility, the Cost of Equity Capital and Ownership Structure: An Analysis of Chinese Listed Firms. *Australian Journal of Management*. 40 (2): 245-276.
- Yawar, S. A. Seuring, S. (2017). Management of Social Issues in Supply Chains: A Literature Review Exploring Social Issues, Actions and Performance Outcomes. *Journal of Business Ethics*. 141 (3): 621-643.
- Ye, K. Zhang, R. (2011). Do lenders value corporate social responsibility? Evidence from China. *Journal of Business Ethics*. 104(2): 197.
- Yeh, Chin-Chen. Fengyi, Lin. Teng-Shih, Wang c. Chia-Ming, Wu. (2020). Does corporate social responsibility affect cost of capital in China?. *Asia Pacific Management Review*. 25 (20): 1-12.
- Zhang, M. Ma, L. Su, J. Zhang, W. (2014). Do suppliers applaud corporate social performance? *Journal of Business Ethics*. 121(4): 543-557

PROFILE OF THE AUTHORS



R. Sotoudeh:

Assistant Professor of Accounting

Holds a doctorate in accounting

Islamic Azad University of Nik Shahr

Researcher in the fields of auditing, management accounting and government accounting