Iranian Journal of Educational Sociology
(Interdisciplinary Journal of Education)
Available online at: http://www.iase-idje.ir/
Volume 6, Number 1, March 2023

Design and Efficiency Measurement of Social Responsibility Model of Companies Active in Capital Market Affected by the Epidemic of Covid-19

Ravanbakhsh Ahmadi[1], Mohammadreza Mehrabanpour[2*]

1. PhD student in finance and accounting, Kish International Campus, University of Tehran, Tehran, Iran.
2. Assistant Professor, Department of Management and Accounting, University of Tehran, Tehran, Iran.

Article history:
Received date: 2022/09/18
Review date: 2022/12/05
Accepted date: 2022/12/20

Keywords:
Social Responsibility, Capital Market, Covid-19.

Purpose: The purpose of this research is to design and evaluate the effectiveness of the social responsibility model of companies active in the capital market affected by the epidemic of the Covid-19 disease.

Methodology: The current research is a mixed research (qualitative-quantitative) and is practical in terms of purpose. In the qualitative part, nineteen members of the expert panel were determined using the snowball method. At the same time, G_Power software was used to determine the size of the statistical sample in the quantitative section, which determined it to be 120 cases. In order to analyze the data to reach the research objectives, Delphi technique was used in the qualitative part. Also, in the quantitative section, structural equation modeling using SmartPLS software was used to measure the efficiency of the model. In the qualitative section, after reviewing the research literature, 19 primary indicators were identified in the form of three main components, and the opinions of the expert panel members were used to measure their effectiveness using the Delphi technique. Finally, after two rounds, this technique reached the saturation stage.

Findings: In the quantitative part, using the PLS technique, it was found that all three main components have a positive and significant effect on social responsibility, and at the same time, in terms of the severity of the order of the factors, it is internal factors, macro factors and company characteristics.

Conclusion: The results of this section show the removal of three indicators from the primary indicators and at the same time the addition of four secondary indicators, which led to the identification of three final components and twenty sub-components.

Please cite this article as: Ahmadi R, Mehrabanpour M. (2023). Design and Efficiency Measurement of Social Responsibility Model of Companies Active in Capital Market Affected by the Epidemic of Covid-19, **Iranian Journal of Educational Sociology.** 6(1): 233-249.

* Corresponding Author: mehrabanpour@ut.ac.it

1. Introduction

The Covid-19 pandemic has highlighted that it is not just a loss of life that we need to worry about but also the impact it can have on businesses, supply chains, economies, and the sustainable development of companies. The pandemic has caused significant disruptions in these areas, making it clear that we need to be better prepared for such situations in the future (McCloskey & Heymann, 2020). According to official global statistics, the effects of the Covid-19 epidemic on global economic activities and financial markets, particularly on organizations' performance, have been unprecedented (Pettenuzzo et al., 2020) and have led to a significant decrease in income for most businesses. (Fahlenbrach et al., 2020).

Global production recorded a general economic recession in 2019, greatly exacerbated by the economic crisis caused by the Covid-19 pandemic (UNIDO, 2020). In this regard, due to the rapid spread of this epidemic in the world market, as an emerging economy, Iran's economy and, consequently, the activities of companies active in the capital market have also been significantly affected. The disease's epidemic has impacted companies' social responsibility activities. The European Commission considers corporate social responsibility as a concept that, in addition to reporting business activities, includes issues such as environmental issues, social reporting, and interactions of companies with multiple stakeholders (Azimi & Arjangi, 2016). Therefore, many companies believe that they use their activities in the field of social responsibility as a source of corporate goodwill as an insulation against the adverse effects of crises (Larimi et al., 2017).

When a company consistently engages in social responsibility and publicly reports its actions, it can positively impact society's psychology. During widespread crises, negative news about company performance becomes more prevalent. However, companies with a favorable social responsibility reputation are less likely to be negatively impacted (Larimi et al., 2017; He et al., 2020). This approach originates from the concept that the purpose of companies to deal with activities related to social responsibilities is to create a suitable image and social reputation in order to attract the opinion of shareholders, investors and stakeholders as a whole (Baatwahm et al., 2022).

At the same time, in the opposite view, existing literature shows that companies use social responsibility as a shield to hide managers' opportunistic behaviors (Maranjory & Alikhani, 2014; Chi et al., 2008; Bahattacharia et al., 2011). It can be assumed that companies that adopt this approach may have a greater need to conceal their poor performance, particularly in the event of various crises that affect their performance. As a result, such companies are likely to be more proactive in performing and reporting social activities. (Lee & Cho, 2022).

The Covid-19 pandemic has caused economic panic among people, governments and businesses. As a result, companies need to prioritize corporate social responsibility in order to alleviate these fears and concerns. Both of the previously mentioned approaches suggest this should be a guiding principle. (Baatwahm et al., 2022).

Based on the existing literature, companies have taken a dual approach when it comes to social responsibility activities in normal situations free from crisis. However, this approach causes uncertainty in the performance of companies in the capital market, especially in social responsibility activities. The emergence of a major global crisis, such as the Covid-19 epidemic, has added to the ambiguity of the quality of companies' performance in the social responsibility field. Therefore, the main objective of this research is to provide a model that identifies and explains the impact of effective indicators on the social responsibility of companies affected by the Covid-19 epidemic.

Based on this, the research questions are explained as follows:

1. What are the most important indicators affecting the social responsibility of companies active in the capital market based on the impact of the Covid-19 epidemic?
2. How is the optimal social responsibility model of companies active in the capital market based on the impact of the Covid-19 epidemic?
3. What is the predictive power of the model?

Literature Review

Based on the review of the literature and research records, it can be observed that there is a significant lack of available information on the indicators that affect the social responsibility of companies in the context of Covid-19. Although this topic is considered under the umbrella of crisis management, its novelty and unprecedented nature make it challenging to examine and understand. The ongoing pandemic has created a new category of crisis, which has not been fully explored yet.

In reviewing the literature on the subject, it is possible to find records of studies that have tried to investigate the impact of various indicators on the company's performance regarding social responsibility.

In this regard, Gul et al. (2021) have conducted a study entitled "social responsibility, CEO Overconfidence and empire building". According to the shareholder theory, their research on American companies shows that social responsibility is related to lower empire-building. These results are strong in endogeneity tests, alternative evidence of social responsibility and imperialism, and the use of alternative methods. In addition, the negative relationship between participation in social responsibility and empire-building is weaker for companies with CEOs with high self-confidence and consistent with the theory of behavioral characteristics. Also, highly self-confident agent managers tend to earn more profits by participating in high social responsibility, especially in companies with low agent manager ownership. Finally, the effect of low evaluation on acquisitions depends on the CEO's overconfidence. Down increases the value of the purchase when the CEO is underconfident but destroys the value when the CEO is overconfident.

Ferrero et al. (2018), in the article "Disclosure of social responsibility, information asymmetry regarding the role of family ownership", investigated this relationship from 2003 to 2009 in international companies. They found a strong two-way relationship between corporate social responsibility and information asymmetry. However, in companies that benefit from higher family ownership, the negative effect of social responsibility on information asymmetry is significantly reduced.

Tang and Singh (2018), in the article titled "How capable managers look at the social responsibility of companies", state that the evidence shows the impact of managers' ability on investment in the case of social activities of companies. They found that higher-ability managers view social activities as desirable investments.

LaRosa et al. (2017) conducted a research titled "The impact of corporate social responsibility on the cost of debt and access to financing through debt in Eastern European non-financial companies". By examining these companies from 2005 to 2012, they concluded that there is a significant negative relationship between the social performance of companies and interest rates. They also found a positive relationship between social performance of companies and debt rating. Therefore, the company's social performance has a positive role in reducing debt costs. In addition, companies with better social responsibility are considered more desirable companies from the point of view of lenders.

In their research, Haslinda et al. (2016) explained the relationship between corporate governance and social responsibility disclosure, emphasizing various aspects of social responsibility. They concluded that continuous improvement in corporate social responsibility disclosure is noticeable. The combined results of their study model show a relationship between corporate governance and disclosure of social responsibility, emphasizing various aspects of social responsibility such as market position, place of activity and society.

Amirhosseini and Ghobadi (2017), in their research titled "Social responsibility reporting, financial performance and institutional ownership", state that corporate social responsibility has been a sensitive and attention-grabbing issue in recent years. Therefore, the present study examines the mediating effect of financial performance on the relationship between corporate social responsibility and institutional ownership. For this purpose, 23 investment companies were tested in two stages as a statistical sample of the research between 2010 and 2013. First, the relationship between corporate social responsibility and financial performance was investigated. Then the relationship between corporate social responsibility and institutional ownership was investigated with the effect of the mediating variable of financial performance. The results indicate the effect of the mediating variable of financial performance on the relationship between social responsibility and institutional ownership.

Foroughi et al. (2017), in an article titled "Management ability, investment efficiency and reporting quality in the field of social responsibility", used Chen's (2011) model to measure investment efficiency. In addition, they used Demirjian et al.'s (2012) model to measure management ability, and the optional accruals model to measure the quality of financial reporting. The study results on 119 companies in 2008-2013 showed that capable managers tend to invest too much. In addition, the quality of reporting in the field of social responsibility causes a positive reduction of managerial ability on excessive investment.

Barzegar and Ghavasi Kanari (2016) studied the relationship between the level of social responsibility disclosure and dividend policy in companies listed on the Tehran Stock Exchange. They used a statistical sample of 324 companies admitted to Tehran Stock Exchange between 2009 and 2014. After controlling the influencing factors on dividend policy used in the previous literature, they concluded that companies with a higher level of social responsibility disclosure have a higher dividend percentage. This result shows that companies active in social responsibility use dividend policy to manage and control their agency problems.

Jahanshad and Torabi (2016), in an article entitled "The impact of social responsibility on the information asymmetry of companies", state that in this article the impact of social responsibility on the information asymmetry of companies has been investigated in 117 companies from the companies admitted to the Tehran Stock Exchange. The most important goal of this research is to investigate the effect of social responsibility on information asymmetry and help joint-stock company managers determine strategies and factors influencing information asymmetry to implement responsibility. The sampling method is systematic exclusion. In this research, the independent variable includes social responsibility, the dependent variable includes information asymmetry, and the control variable includes financial leverage and company size. The results of this research show no significant relationship between social responsibility and information asymmetry due to the lack of corporate governance principles.

However, most of these studies have been investigated in normal conditions. As a result, their efforts to explain the indicators affecting social responsibility have been investigated regardless of the crisis issue. However, some studies have tried to investigate the impact of various crises on social responsibility.

For example, in a research, Teng et al. (2021) tried to explain the sustainable development of companies based on social responsibility based on the financial flexibility of companies during the Covid-19 epidemic. The results show that financial flexibility has a positive and significant effect on sustainable development for the manufacturing companies listed on the Taiwan Stock Exchange, especially in the asset-heavy manufacturing industry. However, financial flexibility does not significantly affect the sustainable development of companies with light assets. This study also shows evidence that the COVID-19 crisis is not conducive to the sustainable development of the studied companies.

Also, Yi (2020), in his research, compared the existing studies in the field of sustainable development (as an evolved topic of corporate social responsibility) and the effective indicators in the models of their interest. Based on his results, many studies have been conducted on the relationship between financial flexibility and company performance in non-pandemic periods. The results of these studies are contradictory because some show that high financial flexibility has a positive effect on sustainable development. Some suggest that the financial and capital structure hurts the company's performance, and some have listed social indicators as the most important development factors.

In this regard, Lozano and his colleagues (2017), in the article entitled "An Analysis of the Contribution of Japanese Business Terms to Corporate Sustainability: Learnings from the "Looking-Glass" of the East", concluded that if a company creates a stable, systematic and comprehensive framework, it can achieve sustainable development. They have understood that the social responsibility of companies has influenced customers' trust and makes the way to achieve sustainable development smoother while attracting their support.

At the same time, Laufer and Coombs (2016), in the article entitled "How should a company respond to a product harm crisis?" concluded that larger companies make a wider effort to provide documents and

evidence for stakeholders in the face of crisis. Although I did, managers are inherently blamed when the company enters a financial crisis, which is weaker in companies with a stronger social position.

At the same time, few domestic studies have tried to find an effective connection between social responsibility and crisis. For example, Nasirzadeh and Marandi (2021) investigated the relationship between responsibility and financial crises concerning the role of political communication. They found a negative and significant relationship between social responsibility and financial crisis, meaning that with the increase in the level of social responsibility, the probability of financial crises in economic units decreases. Other results showed that political communication mainly moderates the relationship between social responsibility and financial crises. Also, Larimi et al. (2015) have investigated corporate social responsibility disclosure in the crisis period. By analyzing the involved companies, this study found that the company's social responsibility during the crisis reduces the attention of the shareholders to the consequences of the crisis, makes the expectations of the company reasonable, and changes the risk assessment for the stakeholders.

2. Methodology

Considering that the research aims to provide a model, the current study is a fundamental type, and in terms of collecting exploratory information and from the perspective of data, it is qualitative-quantitative (mixed). In this research, with qualitative tools and methods, including interviews, qualitative data was collected and analyzed from academic experts, professors, capital market activists, and experts familiar with the concept of social responsibility. Then, it was analyzed quantitatively (structural equation modeling) to complete and use it better and more effectively and make better decisions. By using mixed research methods, a better understanding of the phenomena is provided.

The study's statistical population in the qualitative part is experts, university professors, activists, and capital market experts who are familiar with the concept of social responsibility. In this regard, two panel members with appropriate characteristics were identified using the snowball sampling method. They were then requested to introduce other qualified people with expertise in the subject under investigation. By taking advantage of the opinions of these people, a list of forty experts who have expertise in the field of interest of this research was finally identified. A form was designed and compiled in the next step, including the study's subject, research objectives, duration, and the approximate number of research rounds. This form was given to the mentioned forty experts in the field of social responsibility, and they were asked to express their agreement and willingness to participate in the panel (participants). Finally, among all the people, 29 people showed their willingness and agreement to cooperate in the present study, and their composition is shown in Table 1. It should be noted that the ranking of experts was not discussed in order to prevent the reduction of the number of experts.

Table 1. Panel members information

Field of activity	N	Experience in the field (Year)		
		Less than 2	2 to 5	More than 5
Professors and researcher	16	2	5	9
Capital market experts	13	1	4	8

Notably, the expert panel consisted mostly of men (19 individuals) over 40 years old (13 individuals). Furthermore, most of the panel held a doctorate degree (13 individuals), followed by a master's degree (11 individuals). After identifying the indicators that affect companies' social responsibility in the qualitative part, it is crucial to determine the sample size for the quantitative part. For this purpose, G-Power software has been used, and as shown in figure 1, the sample size was equal to 120. These people are selected from among the managers and experts of companies active in the capital market who have invested in social responsibility. In terms of demographic status, the majority of the statistical sample for the quantitative part were men (112 individuals), with most holding a master's degree (54 individuals). The frequency of individuals between the

ages of 31 to 40 and those over 40 years old was almost identical (49 and 47 individuals, respectively). Finally, most individuals (59 people) had work experience between 10 and 20 years.

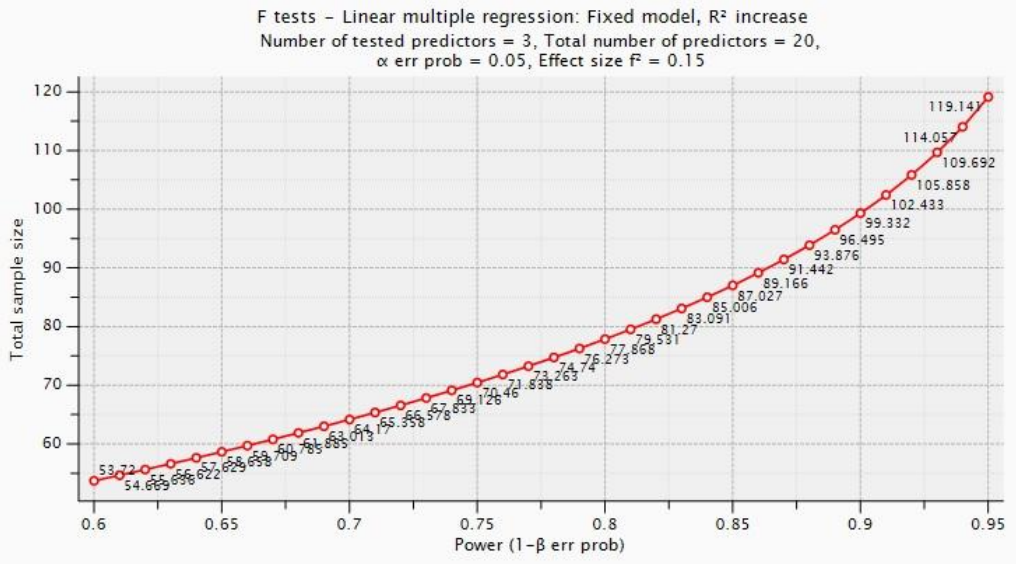

Figure 1. Determining the statistical sample size of the quantitative part using G-Power

In order to collect information regarding the explanation of the research literature, the library method and document studies were used. Also, the main tool for data collection in the qualitative part is semi-structured in-depth interviews, in which the researcher prepares the necessary topics and topics to cover the information, but the questions are open and general; That is, they are not prepared in advance and the flow of the interview relies to a large extent on the questions that arise spontaneously in the interaction between the interviewer and the interviewee. In the qualitative data analysis stage, the interviews were analyzed and the Fuzzy Delphi technique was used. In the quantitative part, the questionnaire created by the researcher, which is the result of the first part of the research, was used.

Finally, in this research, in order to design and test the model, two qualitative and quantitative parts were done. Fuzzy Delphi method was used in the qualitative part. The first step in implementing the current research is to identify effective indicators. In this case, by using a semi-structured questionnaire based on the information obtained by the researcher from the available sources regarding the indicators affecting the topic, the steps of Fuzzy Delphi were followed until reaching the final indicators. Then, they were ranked and prioritized by using the obtained results and identifying important effective factors. Briefly, the steps of this technique are:

Step 1) Collecting experts' opinions in the form of a questionnaire

Step 2) Calculate the fuzzy value of each question

Step 3) Convert the fuzzy value obtained for each of the questions to the defuzzied value

Step 4) Evaluation of questions based on the threshold limit

In the quantitative stage, structural equation modeling was used to explain the model's predictive power. In this section, using SMART-PLS software, the conceptual model of the research was analyzed using the structural equation model. This test includes three sections: measurement model fit, structural model fit, and overall model fit. Therefore, the accuracy of the relationships in the measurement model was first evaluated using validity and reliability criteria. Finally, the relationships in the structural part and the model's overall fit were also examined. It should be noted that at first, the Kolmogorov-Smirnov test was used to ensure the normality of the data. If the data is normal, Pearson's correlation coefficient is used to check the correlation; if it is not, Spearman's correlation coefficient is used.

In the following, the convergence of the items with the corresponding questions was investigated using factor loadings. For this issue, the significant coefficients must be greater than 2.58, which indicates the significance of the factor loadings at the 95% confidence level. Also, Cronbach's alpha and composite reliability were used to confirm the reliability, which should be higher than 0.7. Convergent validity was also examined using the criterion of average variance extracted, which should be higher than 0.5. Also, Fornell and Larcker tests were used to check and confirm the divergent validity. Next, the model's structural fit was examined using R2 and Q2 indices. Finally, the general fit of the model was checked using the GOF index. At the end and after examining the three mentioned models, the significance of the paths was checked using the t-test; If this value is higher than 1.96, the path is considered significant.

3. Findings

A) Qualitative part

A semi-structured questionnaire was designed based on primary indicators identified earlier. This questionnaire is called the primary questionnaire and is essentially the first round questionnaire of the Delphi method. The first questionnaire consists of identified indicators or factors presented in the form of questions. Panel members were requested to express their opinions regarding other possible effective indicators in addition to answering the closed questions. Table 2 summarizes the opinions of the panel members in the first round.

Table 2. Summary of participant's responses to the questionnaire (first round)

Item	Question In your opinion, what is the importance of each of these indicators in the field of social responsibility of companies affected by the Corona epidemic?	Importance range				
		Very low (1)	Low (2)	Medium (3)	High (4)	Very High (5)
1	Company size	0	1	12	13	3
2	Stock price	0	2	4	5	18
3	Company history	0	1	8	15	5
4	Financial performance	0	1	2	16	10
5	Financial leverage	0	1	8	17	3
6	Traded stock volume	1	2	3	13	10
7	Country	3	8	9	9	0
8	Political, social and cultural conditions	0	1	7	14	7
9	Period	2	2	5	15	5
10	Stakeholders' power	0	0	1	5	23
11	Media	0	2	8	14	5
12	Industry type	0	1	11	14	3
13	Macroeconomic components	0	0	5	12	12
14	Board and CEO's attitude	0	0	3	6	18
15	Corporate governance	0	0	1	15	13
16	Decision-making process	1	10	5	12	1
17	Board size	2	7	14	6	0
18	Board independece	0	0	6	11	12
19	Stock held by manager	0	1	8	11	9

It should be noted that the Cronbach's alpha value of the first round questionnaire is equal to 0.86, which is higher than the threshold value of 0.7, which means confirming the questionnaire's reliability.

Next, in this section, the fuzzy value of each research question has been calculated using the panel members' opinions. Then, to determine the importance of each question, the fuzzy values were first converted into fuzzy values so that it is possible to compare with the threshold value (score 3). For this purpose, the following formula is used:

$$S_j = \frac{L_j + 2 \times M_j + U_j}{4}$$

Table 3 presents the fuzzy and defuzzied values of all questions related to the first round of the Delphi technique questionnaire.

Table 3. Fuzzy value and defuzzied value of questions of the first questionnaire

Row	Questions (Indicators)	Fuzzy value			Defuzzied value
		L	M	U	
1	Company size	2	605.3	5	552.3
2	Stock price	2	115.4	5	807.3
3	Company history	2	660.3	5	580.3
4	Financial performance	2	328.4	5	914.3
5	Financial leverage	2	648.3	5	574.3
6	Traded stock volume	1	001.4	5	500.3
7	Country	1	498.2	4	499.2
8	Political, social and cultural conditions	2	791.3	5	645.3
9	Period	1	507.3	5	253.3
10	Stakeholders' power	3	754.4	5	377.4
11	Media	2	747.3	5	623.3
12	Industry type	2	593.3	5	546.3
13	Macroeconomic components	3	313.4	5	156.4
14	Board and CEO's attitude	3	298.4	5	149.4
15	Corporate governance	3	379.4	5	189.4
16	Decision-making process	1	670.2	5	835.2
17	Board size	1	475.2	4	487.2
18	Board independece	3	248.4	5	124.4
19	Stock held by manager	2	087.4	5	793.3

As you can see, questions 7, 16 and 17 have a defuzzied value of less than 3 and are removed from the set of questions. In addition, the panel members introduced a total of four new indicators that may be effective, which were added to the questions of the second round, and the second round of the Delphi technique was implemented.

Thus, the Delphi steps were repeated for new questions and indicators, and the final table of this round was obtained as follows.

Table 4. Summary of participant's responses to the questionnaire (second round)

Item	Questions	Importance range				
1	Company size	0	1	9	16	3
2	Stock price	0	0	6	20	3
3	Company history	0	0	8	20	1
4	Financial performance	0	0	3	16	10
5	Financial leverage	0	1	5	18	5
6	Traded stock volume	1	2	2	17	7
7	Country	0	1	6	20	1
8	Political, social and cultural conditions	0	0	7	15	7
9	Period	0	2	4	23	0
10	Stakeholders' power	0	0	0	1	24
11	Media	0	1	5	15	8
12	Industry type	1	0	8	15	5
13	Macroeconomic components	0	0	2	10	17
14	Board and CEO's attitude	0	0	2	9	18
15	Corporate governance	0	0	0	16	13

16	Decision-making process	0	0	1	12	16
17	Board size	0	4	10	15	0
18	Board independece	0	0	5	11	13
19	Stock held by manager	0	1	4	12	12
20	Company size	0	4	7	18	0

In addition, the table of fuzzy and defuzzied scores can be seen below. As it is clear, all 20 recent questions (indices) have been recognized as effective according to the respondents or the twenty-nine members of the panel.

Table 5. Fuzzy value and defuzzied value of second round questionnaire questions

Row	Questions (Indicators)	Fuzzy value			Defuzzied value
		L	M	U	
1	Company size	2	703.3	5	602.3
2	Stock price	3	019.4	5	009.4
3	Company history	3	695.3	5	847.3
4	Financial performance	3	328.4	5	164.4
5	Financial leverage	2	817.3	5	658.3
6	Traded stock volume	1	967.3	5	483.3
7	Country	2	630.3	5	656.3
8	Political, social and cultural conditions	3	886.3	5	943.3
9	Period	2	607.3	5	553.3
10	Stakeholders' power	4	941.4	5	720.4
11	Media	2	967.3	5	733.3
12	Industry type	1	517.3	5	258.3
13	Macroeconomic components	3	468.4	5	234.4
14	Board and CEO's attitude	3	364.4	5	182.4
15	Corporate governance	4	445.4	5	472.4
16	Decision-making process	3	379.4	5	189.4
17	Board size	2	224.3	4	112.3
18	Board independece	3	298.4	5	149.4
19	Stock held by manager	2	198.4	5	849.3
20	Company size	2	253.3	4	126.3

As shown, the defuzzied value of all the indicators (questions) is greater than the threshold number of 3. Hence, all the recent indicators are recognized as effective, and thus the technique used has reached its saturation stage. In this case, you can be confident about identifying all indicators and effective factors.

b) Quantitative part

In the first step of inferential analysis, it is necessary to examine the correlation between variables, especially between independent and dependent variables. To determine the method of doing the work, first the normality problem is examined to determine the type of correlation test. For this purpose, the Kolmogorov-Smirnov test is used. As shown in Table 6, the significance level for all four variables is lower than 0.05; Therefore, the data are not normal and Spearman's correlation coefficient should be used to investigate the correlation problem.

Table 6. Results of data normality test

Variable	Statistics	p	Distribution
Company characteristics	111.0	000.0	Abnormal
Macro factors	079.0	000.0	Abnormal
Internal factors	196.0	000.0	Abnormal
Social responsibility	088.0	000.0	Abnormal

A positive correlation coefficient means a direct relationship between variables; the closer this positive number is to one, the stronger the relationship. The relationship between two variables is inverse if the correlation coefficient is negative. Therefore, the results of this test can be seen in the table below. As it can be seen, the results of the correlation test confirm the existence of a relationship between the variables.

Table 7. Spearman correlation test results

	Company characteristics	**Macro factors**	**Internal factors**	**Social responsibility**
Company characteristics	000.1	***546.0	***429.0	***724.0
Macro factors	***546.0	000.1	***457.0	***674.0
Internal factors	***429.0	***457.0	000.1	***496.0
Social responsibility	***324.0	***614.0	***796.0	000.1

***: (P<0.01)

Examining factor loadings

One of the important presuppositions of structural analysis is to examine the proper relationship between objects and components. For this purpose, factor analysis is used.

Factor loadings is used on the research's structural model to measure this index's appropriateness. Factor loading coefficients are drawn on the paths between each variable and its questions. Criterion values vary depending on the researcher's level of accuracy to eliminate questions. However, the lowest limit introduced is 0.4 (Holland, 1999).

The result of the first loading shows that all items are appropriate, which can be seen in Figure 2. Therefore, there is no need to delete any of the items.

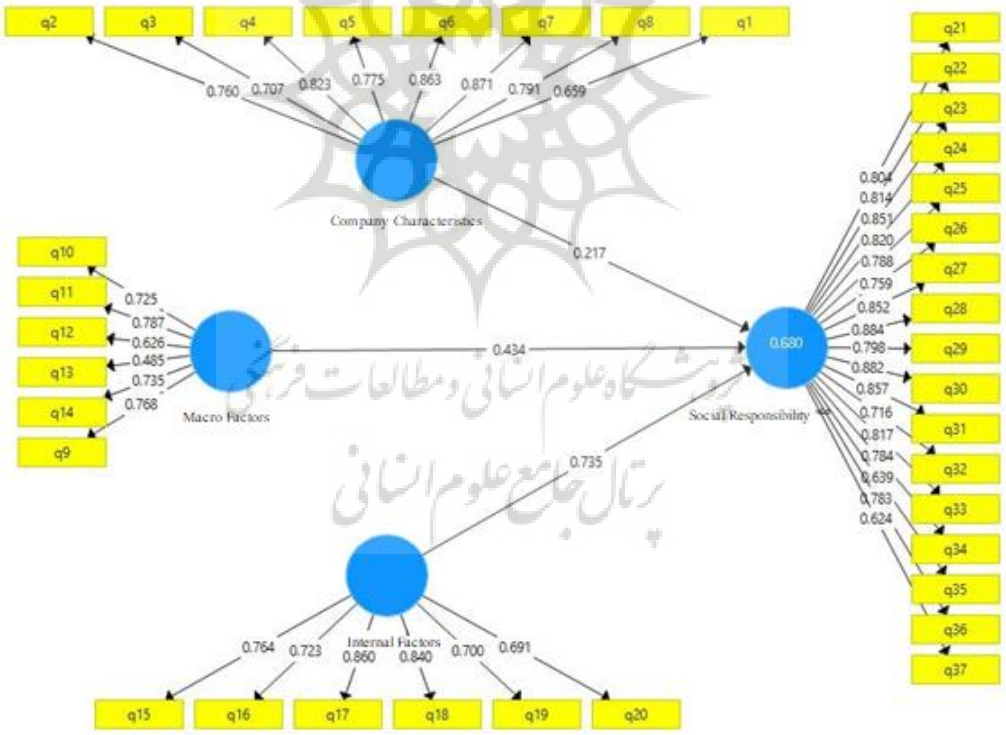

Figure 2. The structural model with factor loadings

Measurement Model Fit

In this case, Cronbach's alpha tests, combined reliability and convergent validity and divergent validity have been used to confirm the appropriate fit quality in the measurement mode, and the results are shown in the following tables. It should be noted that the suitable and acceptable range of each test is displayed in the upper column.

Table 8. The results of Cronbach's alpha and composite reliability criteria

Variable	Alpha	Combined validity
Company characteristics	860.0	869.0
Macro factors	873.0	883.0
Internal factors	832.0	851.0
Social responsibility	889.0	902.0

The traditional criterion for calculating reliability is Cronbach's alpha. Cronbach's alpha is determined based on the amount of data dispersion, and the standard deviation is the main factor of reliability measurement. On the other hand, composite reliability is calculated based on the internal coordination of the questions of each factor, so it is a more accurate measure; the appropriate value for Cronbach's alpha and composite reliability is greater than 0.7 and according to the findings of the above table, this value is higher than this value for all variables; Therefore, the appropriateness of reliability can be confirmed in this research. Also, based on Table 9, the convergent validity of the model is also confirmed.

Table 9. AVE results

Variables	AVE
Company characteristics	0.561
Macro factors	0.587
Internal factors	0.536
Social responsibility	0.529

The next criterion in this direction is divergent validity using the Fornell and Larcker criteria. The logic of Fornell and Larcker's method is based on the idea that a variable shares more variance with its determinants than with other variables (Hair et al., 2017). AVE measure calculates the average extracted variance of a variable. Now, suppose we draw the correlation matrix table between the hidden variables of a path model and specify their correlation level. In that case, It can be seen that on the matrix, the correlation of each variable with itself will be one. In this context, if we remove the diagonal numbers of the table and replace the AVE root of the variables, A table is obtained to show us the possibility of comparing the average value of extracted variance with the correlation of other variables with each other. There are two ways to compare this situation:

First, the square of AVE values is compared with the correlations of hidden variables. In this comparison, the root value of AVE of each variable must be greater than the correlations below that variable.

Second, the square of AVE is compared with the square of its correlations with other variables.

In these two comparisons, the diameter of the table or the diagonal line where the square root of AVE is located must be greater than its underlying correlations to confirm divergent validity: for a hidden variable, the common variance of its coefficients is more than the common variance with other hidden variables

.

Table 10. Results of Fornell Larcker index

	company characteristics	macro factors	internal factors	social responsibility
Company characteristics	749.0			
Macro factors	546.0	766.0		
Internal factors	429.0	457.0	732.0	
social responsibility	324.0	614.0	796.0	727.0

As shown in the above table, the square root of the AVE of each variable is greater than the value of its underlying correlations, so this type of validity is also confirmed.

Finally, the last criterion in this direction is to check the validity of the ratio of different to similar characteristics. Recent studies show that the criteria of transverse loads, as well as Fornell and Larcker, are not enough to check divergent validity, and none of these two methods show issues related to divergent validity. In this regard, Hensler, as a solution, offers the validity criterion of the ratio of different to similar characteristics. Based on this, nowadays, this validity has been noticed by researchers as an important criterion for divergent validity tests. The HTMT criterion is equal to the average of all the coefficients of the reagents that measure different variables compared to the average correlation of the reagents that study the same variables. Regarding the value of HTMT, if it is less than 0.9, there is divergent validity between two reflective variables. As you can see, this is true for all cases.

Table 11. Results of divergent validity index

	Company characteristics	**Macro factors**	**Internal factors**	**Social responsibility**
Company characteristics				
Macro factors	657.0			
Internal factors	439.0	642.0		
Social responsibility	781.0	731.0	792.0	

Structural model fit

This category examines the relationship between variables using criteria such as VIF, R2, and Q2. It should be noted that the R2 criterion is an indicator that shows the impact of an exogenous (independent) variable on an endogenous (dependent) variable; Three values of 0.19, 0.33 and 0.67 are considered as weak, medium and strong thresholds for it, respectively (Hensler et al., 2015).

According to Figure 1, this index has been calculated for the dependent variable, and according to the results, it can be seen that it has a favorable level (R2 = 0.680).

Also, the Q2 criterion determines the predictive power of the model. If its value for an endogenous construct is 0.02, 0.15, and 0.35, respectively, it indicates a weak, medium, and strong prediction of that construct (factor) with related exogenous constructs. (Hensler et al., 2015). The results of this test showed that the adopted value is within the desired range (Q2=0.402).

The final criterion examined in this section will be devoted to the issue of checking the absence of collinearity. In structural models, the estimation of path coefficients is based on OLS regression about endogenous latent variables. Therefore, it is necessary to investigate the colinearity of reflective measurement models.

For this index, each variable's VIF variance inflation factor should be less than 5. Otherwise, it is necessary to delete the variables with collinearity, merge them with other variables, or create coefficients with higher orders (Hair et al., 2011; Ghiathund, 2019).

The results of the investigation of this issue are shown in the next table, and as it is clear, the existence of the problem of collinearity in the model is ruled out.

Table 12. Results of VIF criterion

	Social responsibility
Company characteristics	592.1
Macro factors	844.2
Internal factors	169.2

Overall model fit

The last state to be investigated is the model's fit in the general situation, which is measured by the GOF index. Three levels of 0.01, 0.25 and 0.36 are considered weak, medium and strong thresholds for this criterion. The following formula calculates this criterion:

$$GOF = \sqrt{\overline{Communalities} * \overline{R^2}}$$

In this formula, Communalities is the average of communal values:

$$\sqrt{\left(\frac{0.249+0.270+0.342+0.296}{4}\right) * 0.680} = 0.442$$

Considering that the appropriate threshold for this criterion is 0.36, the fact that this criterion (0.442) is higher than this threshold proves the overall appropriate fit of the model.

It is time to interpret the relationships after ensuring the fit is appropriate in all three cases. If a relationship marked with a directional arrow has a significance coefficient higher than 1.96, it is proof of the significance of that relationship. The coefficient related to this relationship is also specified in the figure of coefficients.

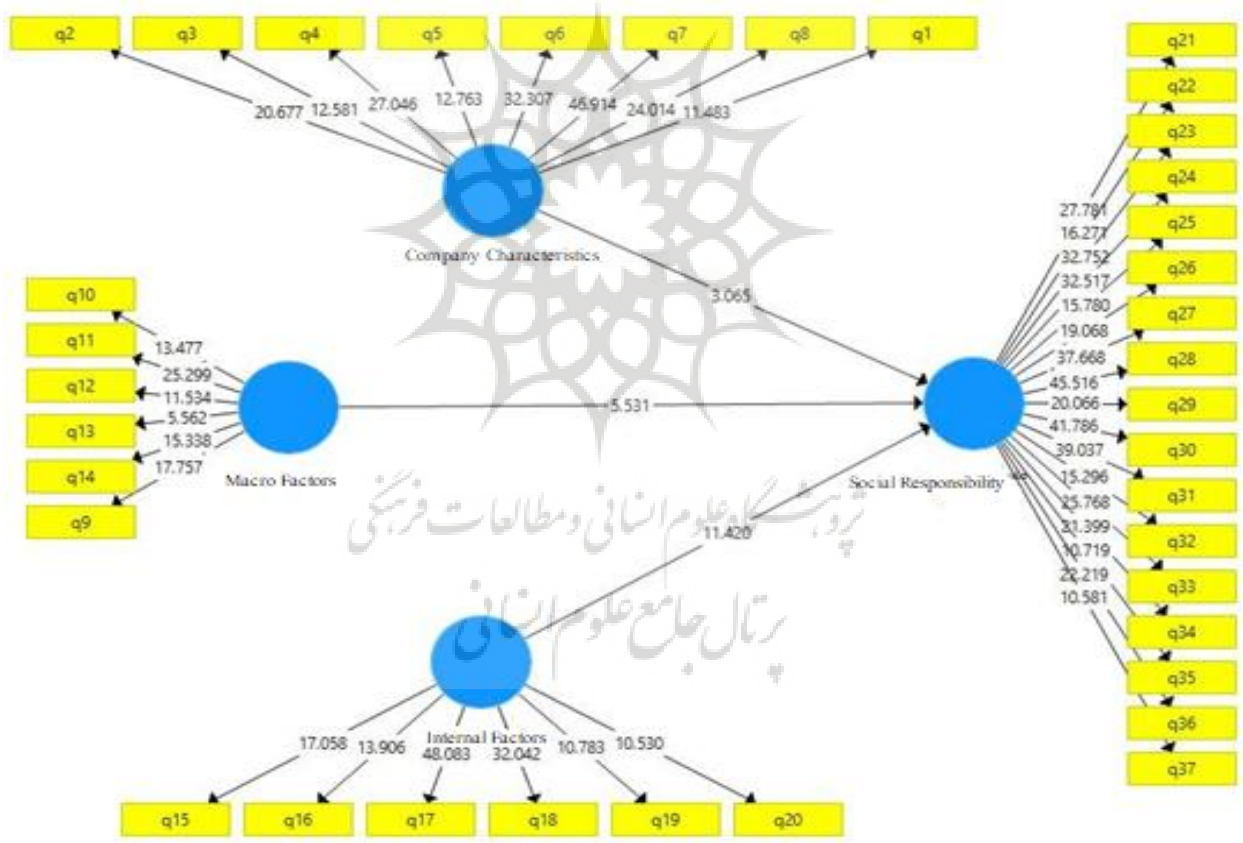

Figure 3. The structural model with significant coefficients

As can be seen from the above figure, all the paths have appropriate statistical significance. In other words, all three independent variables positively and significantly affect the dependent variable.

Examining model paths

After ensuring the optimal fit of the model in all dimensions, the quality of the influence of the independent variables on the dependent variables has been interpreted, summarized in Table 13.

Table 13. The results of research hypotheses

Hypothesis	Coefficients	p	Results
The first path: the effect of company characteristics on the social responsibility of the company affected by the corona epidemic	217.0	065.3	Positive and significant impact
The second path: the effect of macro factors on the social responsibility of the company affected by the corona epidemic	434.0	531.5	Positive and significant impact
The third path: the effect of internal factors on the social responsibility of the company affected by the corona virus epidemic	735.0	420.11	Positive and significant impact

According to the results, all three paths leading to the dependent variable are significant. Therefore, all three main components (independent variables) identified significantly affect social responsibility.

4. Discussion

Analysis of Qualitative Part

The first part of the research was to explain the aim of identifying and prioritizing indicators that affect the quality of social responsibility of companies. Based on this, by studying the existing theoretical bases and records of studies, all indicators affecting social responsibility that have been discussed in the research literature in different periods and studies were identified and listed. In this way, nineteen possible factors were identified and given to the panel of experts. From this list, three decision-making process factors, company size and the country where the company was established, were found to have no effect and needed to be included. It seems that experts are of the opinion that the decision for the quality of social responsibility implementation is not a complicated process and companies have a specific approach in this field according to macro policies. In addition, the reason for removing the board size could be the lack of diversity of this variable in listed companies because most of the companies have five members. On the other hand, considering that the general indicators of Iran are the same for all companies and mostly large companies (especially listed companies) are registered inside the country. Thus, the country of establishment is not an effective indicator in this field.

At the same time, with the addition of experts' opinions and the implementation of the second round of the research, which was also the saturation stage, the research has reached twenty final effective factors, which are divided into the following three main categories: Company characteristics include eight components: company size, stock price, company history, financial performance, financial leverage, traded stock volume, company liquidity, industry type; Macro factors include six components of political, social and cultural conditions, economic macro components, period, power of stakeholders, media, crisis occurrence; and internal factors including six components of board and CEO attitude, corporate governance, cost-benefit analysis in a critical situation, board diversity, board independence and stock held by management.

The final analysis has shown that among the above components, the power of stakeholders is the most important factor. It shows that companies pay more attention to stakeholders' interests in their policy-making regarding social responsibility due to their power. This issue shows that companies are trying to protect the interests of their shareholders and pay more attention to their economic, social and health interests to protect them. In the same sense that Brammer et al. (2021) and Hay and Harris (2020) admit in their studies that the crisis caused by the pandemic causes a change in the way of pursuing the economic, social and environmental goals of companies and gives more importance to the role that companies should play in society. In this new situation, companies must adopt social responsibility strategies to fulfill their business obligations towards society and vulnerable groups, especially those close to them, i.e., stakeholders. In such a situation, the quality of corporate governance mechanisms in companies, which were implemented before such a crisis, is of considerable importance. For this reason, this index is second in importance from the point of view of the panel of experts.

By examining other important prioritized components, it is possible to achieve the variable of the macroeconomic situation and cost-benefit analysis. In addition to the fact that this issue can be interpreted in

line with the findings of the previous section, it shows that companies pay attention to their economic capabilities for investment in the field of social responsibility. Although social responsibility is a long-term investment, it may not be the company's priority in such circumstances. Hessler (2020) also achieved this in his research that companies in such a situation tend to make short-term decisions focused on immediate profits, guaranteeing their survival and thus limiting the funds allocated to corporate social responsibility.

Analysis of Quantitative Part

In the first part (qualitative part), the indicators affecting the quality of social responsibility of companies affected by the coronavirus crisis were identified. As stated, the obtained result was categorized in the form of 3 main components, i.e. company characteristics (with eight effective sub-components), macro factors (with six effective sub-components) and external factors (with six effective sub-components). Finally, a preliminary model was established. In the second part, PLS technique was used to measure the efficiency of this model and determine the intensity of the effect of the identified variables. The sub-components in the form of items and the main components in the form of exogenous (independent) variables were embedded in the model, and the effect of exogenous variables on the dependent variable (social responsibility) was investigated.

The obtained results showed that among the three main factors, in such conditions, more than other factors, these internal factors have a significant effect on the quality of social responsibility. Indicators such as the attitude of managers, the quality of corporate governance mechanisms, board independence, the amount of ownership of managers, etc. are all factors that are usually decided before the crisis regarding the quality of their implementation in the company. Therefore, such companies have a logical and positive view towards these principles by creating dynamic and flexible mechanisms. They can manage and implement their social responsibilities well, even in a crisis, by increasing their ability to monitor, control, and respond.

Also, based on the results, it was found that macro factors are ranked second in terms of intensity of impact on the quality of social responsibility. Macro environmental factors such as economic conditions caused by large crises such as Corona, political and social conditions and stakeholder pressures are of high importance and oblige companies to respond and perform properly regarding their social responsibilities. However, if the companies benefit from the internal indicators mentioned earlier, the impact of macro factors will be of secondary importance.

Finally, it can be seen that the last effective indicator in terms of the intensity of the impact on the issue of dealing with the social responsibilities of companies is the company's characteristics. Indicators such as size, history, financial leverage, financial performance, etc. are of great importance in corporate investment in social responsibility. Nevertheless, based on the findings of this research, it has been determined that in a situation where companies and the country's economy are involved in epidemic crises such as Corona, these indicators are at the lowest level of importance and effectiveness. This could be because these indicators are rigid and less flexible factors that are either impossible or extremely difficult to change in the short term. For example, companies will not be able to change the company size in the short term when faced with a large, urgent and epidemic crisis such as Corona. Also, the history and age of the company cannot be changed. Therefore, these less flexible components will have the least effect in such a situation.

According to the results obtained from this research, the following are suggested:

-1Managers of companies active in the capital market are advised to continuously and regularly ensure the proper implementation of corporate governance mechanisms in an era when the company faces large and macro crises. Therefore, the necessary flexibility for investment regarding social and environmental responsibilities is provided.

-2Also, according to the important priorities obtained from this research, investors, creditors and shareholders are advised to support non-compulsory managers as much as possible in determining the composition of the board members. As a result, they can ensure the favorable quality of dealing with social responsibilities by the company, which is a type of long-term investment. The higher independence of the

board is one of the guarantees of paying attention to social responsibilities. This issue can be achieved by demanding this range of company managers regarding the optimal implementation of other corporate governance mechanisms.

-3Managers of companies are also advised to use cost-benefit analysis to determine whether to transfer investment in the field of social responsibility to the future or reduce the intensity of investment when facing crises such as COVID-19, and to inform stakeholders with transparency information because the pressure from stakeholders to address social responsibilities is one of the most influential factors in this area.

-4Finally, controlling the level of liquidity and capital in circulation and having assets with high liquidity power at hand is an important policy recommended to company managers so that they can leave their hands open for emergency spending in times of crisis.

Acknowledgments

In this research, the ethical standards including obtaining informed consent, guaranteeing privacy, confidentiality, etc. are observed, and the participants are hereby thanked.

References

Azimi M, Ganji Arjangi S. (2016). The Impact of Corporate Social Responsibility (CSR) on Financial Reporting Quality. Accounting and Auditing Studies. 5(17): 96-111. [Persian]

Baatwahm S, Qadasi AA, Shehri AM, Imen D. (2022). Corporate social responsibility budgeting and spending during COVID–19 in Oman: A humanitarian response to the pandemic, Finance Research Letters. 11: 202-218.

Bahattacharia C, sen S, Kurshun D. (2011). Leveraging corporate responsibility: The stakcholder route to maximizing business, new York: Cambridge university press.

Barclay D, Higgins C, Thompson R. (1995). The partial least squares approach to causal modeling: personal computer adoption and use as an illustration. technological studies. 2(2): 285-309.

Chi H, Shen C, Kang F. (2008). Corporate social responsibility, investor protection and earning management, jornal of business ethics. 79(1): 179-198.

Davari A, Rezazadeh A. (2013). Structural equation modeling with PLS software, first edition, Jahad Daneshgahi Publications. Tehran. [Persian]

Fahlenbrach R, Rageth K, Stulz RM. (2020). How Valuable is Financial Flexibility When Revenue Stops? Evidence from the COVID-19 Crisis; Fisher College of BusinessWorking Paper No.

He P, Sun Y, Zhang Y, Li T. (2020). COVID–190s impact on stock prices across different sectors—An event study based on the Chinese stock market. Emerg. Mark. Financ. Trade. 56: 2198–2212.

Larimi J, Norouzi M, Imani Khoshkho O. (2017). Disclosing Social Responsibility in an Age of Financial Crisis. Accounting and Auditing Studies. 6(22): 70-81. [Persian]

Laufer D, Coombs N. (2016). How should a company respond to a product harm crisis, business horizons. 49(5): 379-385.

Lee Y, Cho. (2022). Socially stigmatized company's CSR efforts during the COVID-19 pandemic: The effects of CSR fit and perceived motives, Public Relations Review. 48(2): 123-133. [Persian]

Lozano R, Suzuki M, Carpenter A, Tyunina O. (2017). An Analysis of the Contribution of Japanese Business Terms to Corporate Sustainability: Learnings from the "Looking-Glass" of the East. Sustainability. 9(2): 188.

Maranjory M, Alikhani R. (2014). Social Responsibility Disclosure and Corporate Governance. Accounting and Auditing Review. 21(3): 329-348. [Persian]

McCloskey B, Heymann DL. (2020). SARS to novel coronavirus—Old lessons and new lessons. Epidemiol. Infect. 148: 22.

Nasirzadeh F, Marandi Z. (2021). The Relationship Between Corporate Social Responsibility And Financial Distress by Emphasizing the role of political connections. Stable Economy Journal. 2(2): 81-108. [Persian]

Pettenuzzo D, Sabbatucci R, Timmermann A. (2020). Dividend Suspensions and Cash Flow Risk during the Covid-19 Pandemic; CEPR Discussion Paper No. DP14921; CEPR Centre for Economic Policy Research: London, UK, 2020.

Teng X, Chang BG, Wu KS. (2021). The Role of Financial Flexibility on Enterprise Sustainable Development during the COVID-19 Crisis—A Consideration of Tangible Assets. sustainability. 13: 1–16.

United Nations Industrial Development Organization (UNIDO). World Manufacturing Production Statistics for Quarter II; UNIDO: Vienna, Austria, 2020.

Yi J. (2020). Financial flexibility, dynamic capabilities, and the performance of manufacturing enterprises. J. Res. Emerg. Mark. 2: 19–32.