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Impact of Firm Financial Ratios on Financial Distress: Moderating Role of Corporate Social Responsibility

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ABSTRACT

Purpose: Corporations fall into financial distress or even go into bankruptcy due to many reasons; financial factors are one of the most important factors for financial distress. In previous literature, this element is ignored that those companies are engaged in social activities. Therefore, this study invested the moderating effect of CSR actives.

Design and Methodology: This research focuses on non-financial companies that are listed on the Pakistan Stock Exchange (PSX). This study is quantitative and it deals with secondary data. This comprises data from the year 2012 to 2021. Descriptive statistics, correlation analysis, ANOVA, multiple logistic regressions, and multiple moderated logistic regressions are applied.

Findings: In the overall sample, liquidity, profitability, and activity are found significant and leverage are insignificant at firm-level financial variables. Moreover, CSR only moderates the relationship liquidity and financial distress at 10% level of significance but not moderated with other financial ratios.

Implications and Future Direction: The study's findings will help financial institutions evaluate financial distress and estimate minimum capital requirements to lower the cost of financial risk. The most important limitation lies, in this study is that it only includes non-financial firms listed on the Pakistan Stock Exchange, this study measured CSR as a quantitative approach by measuring the CSR spending ratio. However, future research may also use a qualitative approach (CSR index) for better CSR measurement.

Keywords: Corporate Social Responsibility, Bank Default, Financial Ratio, Financial Distress.

1. Introduction

A corporation is experiencing financial difficulties. Financial distress is the mismanagement of a company's long-term operations to achieve its economic goals. According to Wrack (1990) financial distress is a condition in which operating cash flows are insufficient to

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satisfy existing commitments such as trade payables or interest payments. Bankruptcy is a common issue for businesses. Company bankruptcies not only cause suffering, but they also affect both internal and external parties. Andriana and Rusli (2012) on the offended person Due to the bankruptcy of firms with a stake in the company, such as investors and creditors, the government acts as a third party to collect taxes and reduce unemployment. To minimize losses, all stakeholders and potential investors should do a bankruptcy study before investing. As a result, it is critical to discover early indicators of corporate insolvency, particularly via Manage, before it gets too late and unmanageable.

This research focuses on the relationship between financial ratios and financial distress. Furthermore, the moderating effect of corporate social responsibility on financial ratios and financial distress is examined in this research. Classical economics believed that the social obligation of a corporation was to create value for shareholders (Friedman, 1970). According to this perspective, the primary goal for most businesses is to increase profits. There should be no consequences for other stakeholders or society as a whole if this goal is accomplished. Businesses rely on society to achieve their financial objectives and are part of society. A stakeholder theory states that the better a corporation handles its relationship with its stakeholders, the better. It will become more successful as time goes on (Barnett & Salomon, 2012).

Every firm is designed not exclusively to generate profits, but also optimize and sustain them over an unlimited time period. Companies, on the other hand, may fail to meet their objectives owing to both systemic and unsystematic risk cancers. To solve this issue, numerous researches have been conducted to construct several models using various types of variables (firm level, industry level, and nation level). From a methodological standpoint, most of the studies have used MDA and logistic models, which are statistical models. Financial ratio variables (liquidity, leverage, profitability, and activity) are more significant in financial distress research, this study exclusively addresses corporate financial ratio variable. Secondly, this study also examines the moderating effect between financial ratios and financial distress.

Building on the research context and questions related to previous research specifically, the following is the study's goal:

1. What effect does leverage have on financial distress?
2. How does liquidity affect financial distress?
3. What impact does profitability have on financial distress?
4. What is the impact of the activity on financial distress?
5. Is there a moderating effect of corporate social responsibility on the relationship between financial ratios and financial distress?

2. Literature Review

In this section research hypothesis are developed on the bases of empirical evidence and theoretical background.

2.1 Empirical Evidence and Hypothesis Development

Financial ratios are commonly employed in the analysis and have evolved into prediction models for bankruptcy. Financial ratios are a highly helpful indication that can be calculated from financial accounts that indicate past, present, and future situations (Khaliq, Altarturi, Thaker, Harun, & Nahar, 2014). Financial distress is usually an uncomfortable scenario for a business, and it may have a severe influence on both the firm and the global economy (Rafiei, Manzari, & Bostanian, 2011). The current global financial crisis has prompted certain corporations in the United States, Europe, and Asia to face financial difficulties (Bank, 2009)

According to Subramanyam and Kasmir (2010), the capacity to meet short-term commitments is defined as liquidity. Which is determine by cash flow, asset composition, and current liabilities. The capacity of a corporation to raise cash in the short term to meet its commitments is determined by cash flow, asset components, and current liabilities. The greater the ratio, the less likely the organization will face financial difficulties. Will this, however, have an impact on the trading sector? This research will corroborate this.

H1: *There is a significant and negative relationship between liquidity and financial distress.*

A measure of how much of a company's funding comes from debt is referred to as leverage. This ratio measures a company's ability to repay long-term debt. The corporation is required to repay the principal and interest on the loan when these funds are used. A high amount of income is needed for the company to match its debt. Financial difficulties might be a result of this. In a 2003 study, it was found that leverage ratios were associated with a firm's financial distress.

H2: *There is a significant and positive relationship between leverage and financial distress.*

Profitability is a variable that reflects a company's capacity to earn profits over a certain period, according to Munawir and Kasmir (2010). The bigger the profit made, the more efficient the company's asset management is. As a result, the likelihood of the firm experiencing financial trouble is minimized.

H3: *Profitability and financial distress have a significant negative relationship.*

An activity ratio is a ratio used to evaluate a company's capacity to do day-to-day operations such as selling, collecting receivables, and utilizing owned assets (Munawir, 2010).The higher a contrast, the lower the company’s asset turnover rate, the less efficient its asset management. The activity ratio's low asset turnover is also a red indicator for potential investors. This might be a sign of bad corporate performance. The ratio of activity to the indicator variable total asset turnover influence on the likelihood of financially troubled enterprises.

H4: *The activity ratio has a significant and negative relationship with financial distress.*

Companies with high liquidity demonstrate that they have a big amount of liquid asset that can be used to cover the short-term debt; minimizing financial distress. The condition of liquidity is indicated. The company's abilities include financing its operations and paying off short-term debt. This ratio is used for business disclosure Corporate Social Responsibility Overview Impact of Funding Availability (Corporate Social Responsibility). In comparison to the illiquid firm the direct company has a strong financial state and may release more Corporate Social Responsibility Information. In their capital structure, highly leveraged corporations have more debt than equity, whereas low-leverage companies have less debt. Company because greater leverage requires less disclosure of social responsibility information, you may now report bigger profit (reduces disclosure costs). High-profit firms, according to the static trade-off theory, may easily satisfy debt obligators, allowing them to raise new debt. The comparable literature from financial management research, on the other hand, may explain the issue of default prediction in greater depth. Corporate social responsibility has been a major research topic in the financial literature for decades. Previous research has mostly focused on the impact of corporate social responsibility on firm performance. However, although most research suggests that CSR has a positive impact on profitability, some have found an adverse relationship between CSR and profitability. The higher the asset turnover values of a corporation, the more successful asset management is at earning income. In contrast, the lower the asset turnover rate, the less effective the company's asset management. The activity ratio's low asset turnover is also a red indicator for potential investors. This might be a sign of poor company performance.

According to (Simanjuntak & Wahyudi, 2017) the activity-to-total-asset-turnover ratio has a negative impact on the probability of financially distressed forms.

H5: *Corporate social responsibility moderates the relationship between liquidity and financial distress.*

H6: *Corporate social responsibility moderates the relationship between leverage and financial distress.*

H7: *Corporate social responsibility moderates the relationship between profitability and financial distress.*

H8: *Corporate social responsibility moderates the relationship between activity and financial distress.*

2.2 Theoretical Support

Different approaches measure and forecast financial distress in different ways. They agreed that poor financial performance and excessive indebtedness can exacerbate financial distress. This

study includes several suggestions from the perspective of financial distress, some of which are especially studied in the financial literature, as well as certain corporate social responsibility theories.

Agency theory is a belief that describes the link between principle and agent, as well as how to effectively structure the interaction between shareholders (principal) and management (agent) work. One of the management techniques used to keep principals responsible is liquidity. Liquidity demonstrates a company's capacity to fulfill its existing obligations. A high liquidity score suggests that a corporation has a solid ability to service its present liabilities. As a result, the chance that the firm will escape financial distress the agency hypothesis implies that there is a conflict of interest between the company's shareholders and management. Kholidah, Gumanti, and Mufidah (2016) as the value of the liquidity ratio grows, firms may settle their current liabilities when they are due, helping them to escape financial distress more the liquidity, the lower the number of enterprises in financial distress.

According to trade-off theory, corporations should trade off tax benefits and the cost of financial distress. Many corporate leaders believe that moderate borrowing saves taxes, but excessive leverage can lead to financial disaster. Some empirical data, however, undermines this idea, such as Kester's DeAngelo, DeAngelo, and Wruck (2002) discovery that returns on assets is the most crucial component in determining debt ratios. Furthermore, the researchers suggest that if a corporation achieves larger profits, it makes no difference how much debt the company incurs.

Signalling theory discusses how corporations take steps to provide investors with signals about how management perceives the company's future. By creating qualified or consolidated financial statement information, signalling theory can assist corporations (agents), owners (principals), and outsiders in reducing information asymmetry. According to Ross (1977), when a corporation is in financial distress, there is bad news for the company, which is a negative signal to investors and influences the disclosure. Similarly, a firm with "good news" indicates that the company is in good financial health, which will influence management to disclose corporate information that management wishes to share that can boost the company's performance, even if it is not necessary. Liquidity refers to a company's ability to repay current creditors with current assets (Triwahyuningtias & Muharam, 2012).

2.3 Research Model

The research model (figure 2.1) shows the impact of independent variables i.e. liquidity, leverage, profitability, and activity on dependent variables that is financial distress with corporate social responsibility as moderating role.

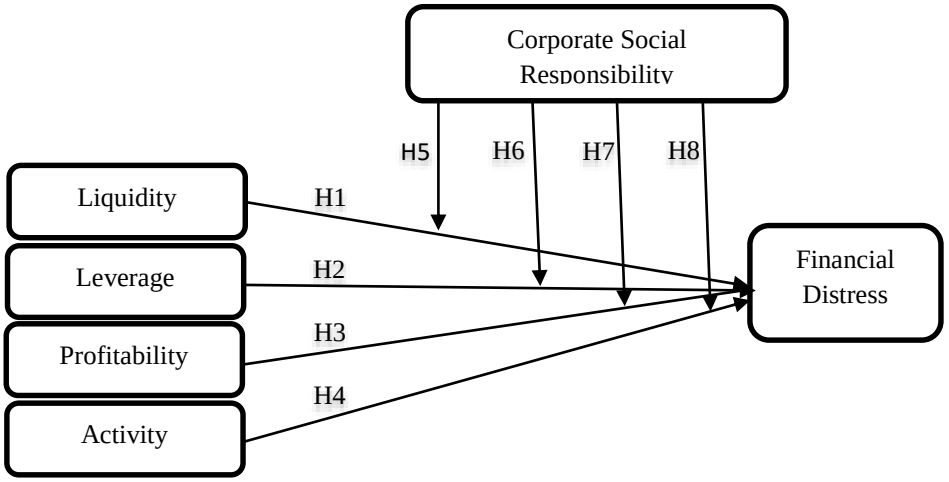

Figure 2.1. Research Model

3. Methodology

3.1 Population and Sample

The current study used a quantitative research technique as opposed to a qualitative one. Secondary data from annual reports and financial statements of enterprises listed on the Pakistan Stock Exchange in various industries and sub-sectors from 2012 to 2021 were utilized in this study. The sample size consists on 80 non-financial firms.

3.2 Research Instruments

In which the financial distresses as dependent variable with liquidity, leverage, profitability, and activity as independent variables that are moderated by corporate social responsibility. This study employed descriptive statistical, correlation analysis, ANOVA, logistic regression, and multiple moderated binary logistic regression by using STATA and SPS software.

4. Data Analysis

In previous section, research hypotheses are tested in accordance with the research topic. This chapter summarizes the data analysis findings to support the study objectives.

4.1 Descriptive Statistics of Independent Variables

The descriptive statistics were utilized in the study to introduce some of the variable's essential qualities. This section gives a detailed descriptive study of the organizational variables of Pakistan's listed companies. The summary includes the mean, standard deviation, lowest and highest levels of overall financial distress. Table 4.1 gives descriptive information for 80 companies, from which 17 are considered financially distressed and 63 of which are considered non-distress, for a total of 800 observations. It was discovered that among the financial variables at the company level.

However, the average liquidity ratio of non-distressed firms (1.5170) is greater than that of distressed companies (.8196) but the standard deviation of distressed companies (.8000) is less than what could be a cause of financial distress in Pakistan. Furthermore, the mean leverage ratio of non-distressed firms (2.5231) is greater than that of distressed firms (1.0649), which indicate that highly leveraged firms in Pakistan are low chances of financial distress. Second, the debt used by highly leveraged firms is rapidly changing, as the standard deviation (33.4493) is larger than that of non-distressed firms (15.1286).

The mean value of profitability of non-distressed firms (7.0834) is greater than distressed firms (-5.5146) indicating that non-distressed companies had higher financial performance than distressed companies. Which was comparable to distressed companies' standard deviation (17.1045) greater than non-distressed companies (9.5790) also supports this argument that non-financial firms are more stable than distressed firms. Finally, the average activity ratio of non-distress and distressed companies is (1.2145) and (.5658), respectively, demonstrating that non-distressed firms use their assets more efficiently than distressed firms in Pakistan.

To summarize, the mean value of non-distressed enterprises is greater than that of distressed firms based on an overall study of firm-level financial indicators. That is, the enterprises that rely on borrowing are in distress. The standard deviation shows that financially distressed enterprises have the greatest variance in profitability, followed by indebtedness. Non-distressed enterprises, on the other hand, have the least diversity.

In the current study, corporate social responsibility is a moderating variable. The descriptive statistic for moderating variable is shown in Table 4.2. The mean values of corporate social responsibility for non-distressed and distressed enterprises in the whole sample of selected companies were 5.1279 and 1.1180, respectively. The standard deviations for non-distressed and distressed enterprises' corporate social responsibility are 12.3620 and 10.8941, respectively. Furthermore, the change in the corporate social responsibility of non-distressed enterprises is significantly bigger than that of distressed firms.

Table 4.1: Descriptive Statistics of Independent Variables (Overall Sample)

Financial Distress	Liquidity	Leverage	Profitability	Activity

on-Distress	N	629	629	629	629
	Minimum	.0001	-20.69	-19.14	-13.000
	Maximum	11.0164	371.24	67.59	18.480
	Mean	1.5170	2.5231	7.0834	1.21455
	Std. Deviation	1.1941	15.12869	9.57900	1.134611
Distress	N	171	171	171	171
	Minimum	.0068	-411.27	-156.68	.000
	Maximum	7.2131	81.92	41.55	2.360
	Mean	.8196	1.0649	-5.5146	.56580
	Std. Deviation	.8000	33.44937	17.10455	.534801
Total	N	800	800	800	800
	Minimum	.0001	-411.27	-156.68	-13.000
	Maximum	11.0164	371.24	67.59	18.480
	Mean	1.3679	2.2114	4.3906	1.07588
	Std. Deviation	1.1570	20.45255	12.69149	1.069347

Table 4.2: Descriptive Statistics of CSR Spending Overall Sector

Financial Distress	N	Minimum	Maximum	Mean	Std. Deviation
Non-Distress	629	-46.1342	97.5578	5.1279	12.3620
Distress	171	-66.7850	58.9901	1.1180	10.8941
Total	800	-66.7850	97.5578	4.2708	12.1684

4.2 Correlation Analysis

Correlation analysis was utilized in this study to assess the relationship between the variables. The correlation matrix for the corporate data between the independent variables and the moderator factors is shown in Correlation Table 4.3. In this table, profitability is positively significant with liquidity, and activity is positively significant with liquidity or again activity is positively significant with profitability. Furthermore, leverage negative or insignificant correlated with each other based on corporation data.

Table 4.3: Correlation Matrix (Overall Sample)

		Liquidity	Leverage	Profitability	Activity
Liquidity	Pearson Correlation	1	-.015	.285**	.261**
	Sig. (2-tailed)		.681	.000	.000
	N	800	800	800	800
Leverage	Pearson Correlation	-.015	1	.032	.033
	Sig. (2-tailed)	.681		.359	.358
	N	800	800	800	800
Profitability	Pearson Correlation	.285**	.032	1	.223**

	Sig. (2-tailed)	.000	.359		.000
	N	800	800	800	800
Activity	Pearson Correlation	.261**	.033	.223**	1
	Sig. (2-tailed)	.000	.358	.000	
	N	800	800	800	800

** Correlation is significant at the 0.01 level (2-tailed).

4.3 Independent Variables Difference by Means of ANOVA

This section builds on the previous section by performing an analysis of variance (ANOVA) on the observed variations in means. This strategy is used to test the null hypothesis, which assumes that the means of the groups are equal. Deviations are divided into between-group and within-group variances by the model. The between-group variance indicates the treatment's effect, whereas the within-group variance often represents the variety of random variations. The study used one-way ANOVA with sector dummy variables to investigate how sector categorization influences several forms of variability in Pakistan. Dummy variables are used to compare variations between sectors for this purpose. Table 4.4 shows the ANOVA in both non-distress and distress cross-sector variables. One-way ANOVA is used to compute the sum of squares, degrees of freedom, mean squares, f-values, and p-values. At the 5% level of significance, differences in averages across groups suggest that industry categorization has a significant impact on all forms of financial distress. The ANOVA analysis revealed significant variations between industries in Pakistan. Except for financial leverage, factors are significant. As a result, logit analysis was utilized in the study to predict variations in group determinants across industries.

Table 4.4: One Way ANOVA of Independent Variables (Sectorial factor)

		Sum of Squares	df	Mean Square	F	Sig.
Liquidity	Between Groups	8.900	1	8.900	17.208	.000
	Within Groups	102.404	198	.517		
	Total	111.305	199			
Leverage	Between Groups	51.684	1	51.684	.072	.789
	Within Groups	142973.161	198	722.087		
	Total	143024.845	199			
Profitability	Between Groups	2333.299	1	2333.299	48.884	.000
	Within Groups	9450.785	198	47.731		
	Total	11784.084	199			
Activity	Between Groups	9.435	1	9.435	6.534	.011
	Within Groups	285.921	198	1.444		
	Total	295.356	199			
CSR Spending	Between Groups	953.530	1	953.530	5.445	.021

	Within Groups	34673.799	198	175.120
	Total	35627.329	199	

4.4 Analysis Based on Multiple Binary Logistic Regression

This section begins with a multiple logistic analysis used to estimate the impact of firm-level factors. From 2012 to 2021, the study applies a binary logistic regression model as an inference test on data from Pakistani listed non-financial firms. Profitability (PROF), liquidity (LIQ), leverage (LEV), and activity (ACT) are the four independent variables listed in Table 4.5 (AVG).

Table 4.5: Estimation Result of Logit Analysis for Firm-level Variables

Financial distress	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
liquidity	-0.515	0.186	-2.77	0.006	-0.880	-0.151	***
leverage	0.002	0.005	0.30	0.760	-0.008	0.012	
profitability	-0.149	0.018	-8.28	0.000	-0.184	-0.114	***
activity	-0.853	0.173	-4.93	0.000	-1.193	-0.514	***
Constant	0.256	0.252	1.02	0.310	-0.238	0.751	
Mean dependent var		0.214	SD dependent var			0.410	
Pseudo r-squared		0.303	Number of obs			800.000	
Chi-square		251.606	Prob > chi2			0.000	
Akaike crit. (AIC)		588.607	Bayesian crit. (BIC)			612.030	

**** p<0.01, ** p<0.05, * p<0.1*

The model's contribution to these three independent variables is statistically significant and therefore cannot reject the hypothesis. Furthermore, table 4.5 shows that liquidity is a negative and significant impact on financial distress with a p-value 0.006. And profitability also has a negative and significant impact on financial distress with p-value 0.000. And the activity is a negatively significant effect on financial distress with h p-value 0.000. Lastly, the leverage is a positively insignificant impact on financial distress with a p-value 0.760. In other words, the size of the DER value is insufficient to predict a company's financial distress. A firm with a high DER value is not always categorized as one in financial distress, nor is a company with a lower DER value necessarily classified as one that is not.

4.5 Prediction Power of Logistics (Model-1)

This section will examine Model-1's prediction power when only firm-level data are used as independent variables. Classification tables, pseudo R2, and chi-square may all be used to evaluate model performance (see Table 4.6), but so can Type I and Type II error rates. As a result, the same holdout samples were used in this study for further analysis. The receiver operating

characteristic curve (ROC) analyses the diagnostic test's accuracy in discriminating between distressed and non-distressed firms by using each logit score value as a possible cut-off point for this purpose. The research provides use of a ROC curve of sensitivity (the percentage of true pain results that are appropriately assigned) vs. diagnostic test 1-specificity (percentage of incorrectly assigned false distress results). Based on the model established by the logistic regression predictions, the area under the ROC curve will be determined. The higher the area under the ROC curve, the greater the predictive capacity of the model, and the steeper the diagonal slope, the stronger the model. As shown in Figure 4.1, the ROC value for multiple logistic model predictive power is 0.8581.

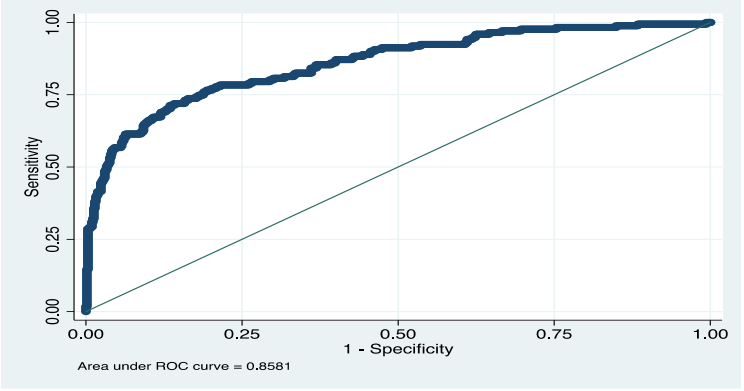

Figure 4.1. Receiver Operating Characteristic Curve (ROC) without moderating effect

Profitability (PROF), liquidity (LIQ), leverage (LEV), and activity (ACT), are the four independent variables listed in Table 4.6. These four independent variables make a statistically meaningful contribution to the model. Each predictor or independent variable's contribution or relevance is represented by beta, standard error (SE), and p-value in the table. As shown in Table 4.6, the model has only one statistically significant variable. In table csr×liq is negatively significant impact on financial distress with p-value 0.057. To put it another way, corporate social responsibility moderates the relationship of liquidity and financial distress. When CSR moderating factors are used, profitability and leverage show a negative and insignificant relationship with financial distress. However, activity is positively associated with financial distress but don't moderate.

Table 4.6 Estimation Result of Logit Analysis for Moderating Variables

Financial distress	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
liquidity	-0.469	0.189	-2.49	0.013	-0.838	-0.099	**

leverage	0.005	0.005	0.87	0.385	-0.006	0.016	
	-0.143	0.018	-7.80	0.000	-0.179	-0.107	***
profitability							
activity	-0.892	0.179	-4.98	0.000	-1.242	-0.541	***
CSR	0.021	0.027	0.75	0.452	-0.033	0.074	
spending							
csr liq	-0.047	0.025	-1.90	0.057	-0.095	0.001	*
csr lev	-0.002	0.002	-0.72	0.473	-0.006	0.003	
csr prof	-0.002	0.003	-0.51	0.613	-0.009	0.005	
csr act	0.020	0.022	0.88	0.382	-0.024	0.063	
Constant	0.303	0.258	1.18	0.240	-0.202	0.809	

Mean dependent var	0.214	SD dependent var	0.410
Pseudo r-squared	0.311	Number of obs	800.000
Chi-square	257.991	Prob > chi2	0.000
Akaike crit. (AIC)	592.222	Bayesian crit. (BIC)	639.068

*** *p<0.01*, ** *p<0.05*, * *p<0.1*

4.6 Prediction Power of Logistics (Model-2)

When the firm-level variables are analyzed together in Model 2, the ROC value is given as 0.8581, as illustrated in Figure 4.2. As shown in Figure 4.1, Model-2's ROC value is same that Model-1's value of 0.8581. This result demonstrates that the model's predictive capability is not growing.

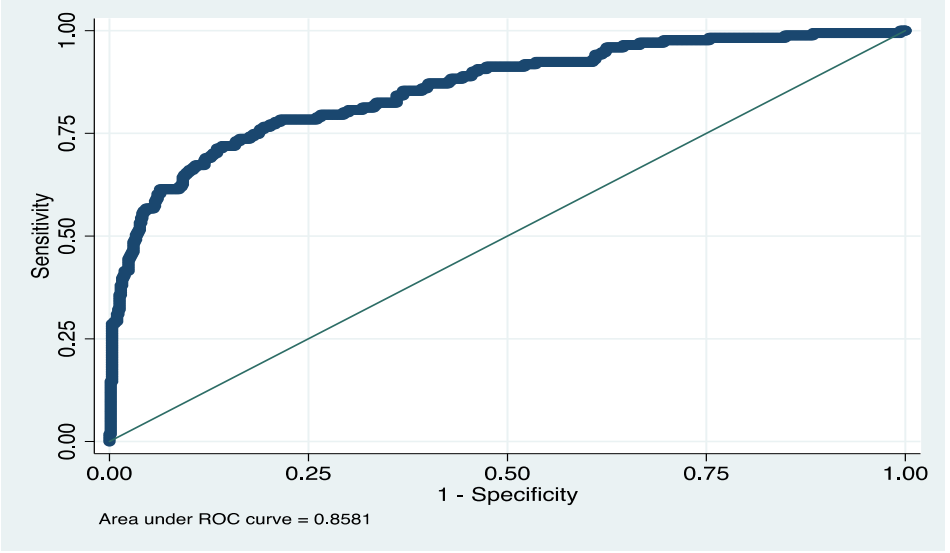

Figure 4.2. Receiver Operating Characteristic Curve (ROC) with moderating effect

5. Discussion

The research focuses on the impact of several financial ratios and independent variables on the financial distress of non-financial firms listed on the Pakistan Stock Exchange (PSX). In the first step, the study used group descriptive statistics to examine the behavior of independent variables by categorizing enterprises as distressed or non-distressed. The correlation matrix between all independent and moderating variables was then investigated. For both firms and sectors, descriptive, correlation matrix, and ANOVA analyses are performed in the initial analysis group. The behavior of independent variables and moderating variables are reported differently, especially when these are evaluated at different levels across different sectors. Nevertheless, the influence of the distinctive nature of each sector is on firms' financial decision-making; it is undeniable that firm-level characteristics hold the primary position in the determination of financial distress of Pakistani listed firms.

Determinants of financial distress were identified by using multiple logistic regression and moderated multiple logistic regression was used to investigate the moderating effect of corporate social responsibility of firm-level financial variables on financial distress. In the overall sample, liquidity, profitability, and activity are significant and leverage are insignificant at firm-level financial variables. In moderation analysis, corporate social responsibility moderates the relationship liquidity and financial distress at 10% level of significance. Moreover, CSR not moderated with other financial ratio and financial distress in the overall sample.

6. Future Recommendations

The findings of this study pose a great and complex challenge to researchers in the area of credit risk evaluation and financial distress prediction by examining the literature in depth and breadth. Several future research fields are in high demand. In start with, a larger sample period is required to confirm the findings. In line with the importance of financial distress studies, different statistical and theoretical models can be employed to validate the research. Moreover, the artificial neural network approach can also be used as an alternative approach to address financial distress. This study measured CSR as a quantitative approach by measuring the CSR spending ratio, however, future research may also use a qualitative approach as a CSR index for better capturing CSR measurement. Finally, predictive ability of logistic regression is not improved by considering CSR as moderating variable in existing model.

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