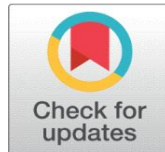
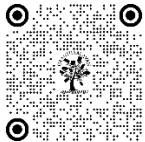


"IMPACT OF MACROECONOMIC FACTORS ON BUSINESS FAILURE: AN EMPIRICAL STUDY OF INDIAN COMPANIES"

Ashley D'Souza¹✉, Dr Chandrashekhar R²✉

¹ Assistant Professor, Department of MBA, Vivekananda College of Engineering and Technology, Nehru Nagar, Puttur, Karnataka - 574203, India

² Assistant Professor, Department of Business Administration, Mangalore University, Mangalagangothri, Karnataka-574199, India



Corresponding Author

Ashley D'Souza, ashley.vcet@gmail.com

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ABSTRACT

The study mainly aimed to analyze the impact of macroeconomic variables on business failures. The study considered inflation, GDP, foreign direct investment, government debt, and listed company data as dependent variables, and Return on Equity as an independent variable. For the study, data from 10 Indian listed companies were considered for the period from 2014 to 2020. The study uses a panel data regression method employing fixed-effect and random-effect models. The regression analysis provides a detailed examination of the relationship between Return on Equity (ROE) and several key economic indicators, shedding light on the intricate dynamics that shape profitability within the studied context. These findings suggest that the current model may not adequately capture the full range of determinants affecting profitability, thus showing that macroeconomic variables are notable in predicting business failures. Further research with more macroeconomic variables and modifications of the model is required to improve its prediction accuracy and explanatory depth, resulting in a more robust framework for understanding and analyzing ROE in the context of the study.

Keywords: Business Failure, Macroeconomic Variables, Indian Companies, Financial Distress, Bankruptcy, Liquidation, India



1. INTRODUCTION

In the complex global economies, India stands out as a shining example of rising potential and resilience. "Business failure, also known as financial distress and bankruptcy plays a crucial role in decision-making in a variety of fields, including accounting, finance, business, and engineering" Sun et al. (2014). Many researches have been conducted to determine the causes of business failures from a global perspective. Many studies have concluded that business failures are caused by a lack of capital, inadequate management, a weak business model, the country's economic situation, and unsuccessful marketing methods, among other things.

Business failure is a crucial topic in decision-making across accounting, finance, business, and engineering. However, its corporate sector has seen both meteoric leaps and abrupt failures. Senapathi(2016) research in India is still in its early stages and is heavily influenced by market conditions. Studies could not be conducted without data on troubled organisations; therefore, academic research has employed rating data available from secondary sources to identify distressed companies. Wilkinson (2009) examined whether business failure were naturally based on an analysis of

individual performance data, primarily financial ratios. Altman's Z-Score model, introduced in late 1960, was the first to use the statistical technique (MDA) to determine whether a company was likely to fail. Understanding the macroeconomic causes of these failures is important for policymakers, investors, and entrepreneurs. This empirical study dives into macroeconomic variables to uncover their association with business failures in the Indian context, a topic that, while studied, has rarely been deconstructed with a focus on this lively economy.

India's distinct economic landscape, defined by its large population, various industry sectors, and fast globalisation provides an ideal setting for investigating how macroeconomic influences shape firm fates. Business failures, which are frequently viewed through the narrow lens of individual organisational shortcomings, are heavily influenced by macroeconomic factors. This paper proposes that understanding these macroeconomic determinants provides a clearer lens through which to predict and potentially reduce patterns of business failure in India. Using a rigorous empirical technique, this study examines several macroeconomic indicators such as inflation rates, interest rates, GDP growth, foreign currency rates, and fiscal policies to determine relationships with company failure rates in various sectors of India. By doing so, it hopes to give a comprehensive understanding of how macroeconomic volatility affects corporate sustainability, providing insights that can drive strategic decision-making for stakeholders across the board. This study is not only a reflection on what causes business failures in India, but also a forward-looking analysis that aims to provide enterprises with the knowledge they need to navigate the stormy waters of the global economy.

2. OBJECTIVE

This study examines how macroeconomic factors impact business failure predictions.

3. LITERATURE REVIEW

Failure prediction, based on the work of (Altman 1968) and (Beaver 1966), investigated the predictive capacity financial ratio combinations (Zmijewski, 1984). This research regularly reveals that a considerable percentage of bankrupt enterprises can be accurately anticipated one year before (Altman, 1968). The ratios to predict failure do not contain information about the intervening economic conditions and the riskiness of a given value of ratios changes with the business cycle.

(Shrivastava et al. 2018) predict corporate distress in India using an extensive panel dataset and using standard Logistic and Bayesian modelling, with Bayesian methodology showing consistently better predictive capability. This structure provides valuable early warnings of failure in the Indian corporate sector. (Constantin 2017) examine the impact of industry-specific effects and intersectional customer-supplier relations on corporate default prediction in US exchange-listed companies from 1997-2015 showed default intensities are related to industry financial health and competition levels. Factors like main commodity suppliers and sectoral network positions also contribute to prediction accuracy. (Tomas, I., & Dimitri, M. 2011) discusses the lack of macroeconomic variables in predicting business failures, highlighting the require for a more comprehensive approach and suggests future research should focus on using macroeconomic aspects in predicting company failures.

(Acosta-González et al. 2017) used econometric models for predict business financial failure in the Spanish construction sector from 1995 to 2011, focusing on macroeconomic variables and financial ratios. The models achieve high predictive success rates, with success rates of 98.5 and 82.5% for in-sample and out-of-sample predictions. (Korol 2017) examines the causes of corporate bankruptcies in Poland and how to predict their scale. The study analyses endogenous and exogenous causes of bankruptcy, considering three phases of crisis. It focuses on 185 companies listed on the Warsaw Stock Exchange, calculating 14 financial ratios for each six years. The author also identifies macroeconomic variables affecting bankruptcy processes and uses a fuzzy logic model to forecast bankruptcy intensity in Poland. The model's effectiveness is 84%. (Rezende et al. 2017) presents a predictive model for predicting financial distress using logistic regression and panel data from Brazilian publicly traded companies. Included macroeconomic and sector variables, and was found to predict financial distress in 96% of companies that went bankrupt. The model showed 89% accuracy when applied to publicly traded companies in Brazil. (Nouri & Soltani 2016) predict failure using data from 53 non-financial companies from 2007 to 2012. The model's accuracy was 91.2% and 82.1%, respectively, using accounting and market variables. However, no significant correlation was found between macroeconomic variables and bankruptcy probability likelihood. (Mare 2015) suggests that bank failure is better captured when considering both national and regional economic conditions using a wider spectrum of information for better default prediction models and countercyclical

capital buffers. (Tinoco and Wilson 2013) examine the use of accounting, market-based, and macroeconomic data to explain corporate credit risk in listed companies. It developed risk models for financial distress and bankruptcy, aiming for predictive accuracy, practical value, and macro-dependent dynamics relevant to stress testing. (Salman et al. 2011) time series co-integration approach was used to examine the relationship between macroeconomic factors and manufacturing firm failure in the Swedish manufacturing sector from 1986 to 2006. The study found that there is a negative correlation between firm failure and industrial activity, money supply, GNP, and economic rate. (Zaki et al. 2011) used the Bank Scope Database and annual reports in UAE during 2000-2008 to estimate a probability distress prediction model. The study finds that fundamentals like cost income ratio, equity to total assets, total asset growth, and loan loss reserve to gross loans positively impact the probability of financial distress in the next year. (Ahmad et al. 2009) examine linkages between corporate failures in Malaysia with macroeconomic variables using the Autoregressive Distributed Lag (ARDL) bound test. Results show that corporate failure rates in Malaysia are significantly positively associated with lending rate, inflation rate, and GDP in the long run. (Liu 2009) showed that macroeconomic aggregates, such as interest rate, credit, profits, inflation, and business births, have differential impacts on business failures in both the short and long run. (Bhattacharjee et al. 2008) examine the impact of the macroeconomic environment on business exit in the UK, considering both bankruptcies and acquisitions as co-determined factors by regression models over 38 years. The findings suggest that the processes of bankruptcies and acquisitions are influenced by the macroeconomic environment. (Nam et al. 2008) reveal how the failure rates of listed companies in the Korea Stock Exchange are affected by macroeconomic environment changes and unique financial characteristics. (Liou and Smith 2006) examined the relationship between corporate failure and macroeconomic factors in the UK manufacturing industry. (Liu 2004) investigated the determinants of UK corporate failures concerning macroeconomic phenomena over the period 1966-1999 and findings indicate that failure rates are linked with interest rates, credit, profits, price, and corporate birth rates both in the short run and in the long run. (Wadhvani 1986) explored the negative impacts of high inflation on the real economy, including increased bankruptcy rates, default premia, and stock market decline. The above studies demonstrated that the impact of macroeconomic variables on failure is determined by numerous macroeconomic variables. The study attempts to examine the impact of macroeconomic variables on predicting business failures of Indian companies.

4. DATA AND METHODOLOGY

The study conducted using cross-sectional time-series data, which was compiled from the financial statements of ten financially distressed companies for each year between 2014 and 2020. The reason for the coverage spanning from 2014 to 2020 is due to data availability, and the data was collected from the website 'www.screener.in'.

4.1 HYPOTHESES OF THE STUDY

The study focuses on analyses the impact of macroeconomic variable on predicting business failure. In this regard the following hypotheses have been developed.

H0: There exists a no significant impact of macroeconomic variables on business failure.

H1: There exists a significant impact of macroeconomic variables on business failure.

4.2 SPECIFICATION OF THE MODEL

The study uses Return on Equity as an independent variable against Macroeconomic variables as dependent. Return on Equity (ROE) is a financial term that measures a company's profitability and efficiency. The linear relationship between the independent and dependent variable is developed. The following panel data regression equation symbolizes this.

$$Y = \alpha + \beta x_1 + \beta x_2 + \beta x_3 + \beta x_4 + \beta x_5 + \beta x_6 + \varepsilon$$

Where,

"Y" represents ROE

" x_1 " represents value of Inflation

" x_2 " represents the value of GDP,

" x_3 " represents value of FDI,

" x_4 " represents value of Central government Debt,

" x_5 " represents number of Listed Companies,
 " x_6 " represents value Stocks Traded,
 " β_1 " value of Inflation,
 " β_2 " value of GDP
 " β_3 " value of FDI
 " β_4 " Central government Debt
 " β_5 " number of Listed Companies
 " β_6 " value Stocks Traded
 " β " represents the alpha intercept of the equation.
 " ε " represents the error term.

4.3 DATA ANALYSIS TECHNIQUE

Panel data regression analysis is used in the study. Panel data regression takes into account the individual heterogeneity of different samples, whereas time series and cross-sectional analyses do not. Panel Data regression includes three models. They are: Panel data regression analysis is used in the study. Panel data regression takes into account the individual heterogeneity of different samples, whereas time series and cross-sectional analyses do not. Panel Data regression includes three models. They are:

1. Pooled OLS Regression Model
2. Fixed Effect Model
3. Random Effect model

Pooled OLS model does not account for the heterogeneity or individuality of data samples. It assumes that all companies are similar in terms of data characteristics. The data in this study is heterogeneous because the sample companies are from various industries. Therefore, Pooled OLS cannot be used. This model assumes that the coefficients are the same across all samples.

The Fixed Effect (FE) Model allows for individual differences in sample data. It assumes that the intercept may vary between companies, but it remains constant over time. On the other hand, the Random Effect (RE) Model also accommodates individual differences. It assumes that the data being analyzed are drawn from a hierarchy of different populations with varying differences related to that hierarchy.

Because the sample is drawn from a variety of industries, it is assumed that it is heterogeneous. Therefore, either the FE or the RE model should be used. The Hausman's Test is used to choose between the FE and RE models.

5. ANALYSIS AND INTERPRETATIONS

5.1 SUMMARY OF DESCRIPTIVE STATISTICS

	INFLATION	GDP	FDI	GOVT. DEBT	LISTED COMPANIES	STOCKS TRADED VALUE	ROE
Mean	6.927666	2.10E+12	1.930688	39.73275	4617.412	47.88161	0.350576
Median	6.623437	2.04E+12	1.784826	49.96472	5112.000	45.33755	0.000000
Maximum	11.98939	3.39E+12	3.620523	59.66673	5835.000	89.61789	31.55617
Minimum	3.328173	9.40E+11	1.312935	0.000000	0.000000	0.000000	-2.451078
Std. Dev.	2.603165	7.17E+11	0.570043	23.00468	1765.080	26.09326	3.675543
Skewness	0.433907	0.120222	1.607079	-1.158841	-2.229014	-0.165973	7.811956
Kurtosis	2.097800	2.011558	5.551966	2.484260	6.265890	2.491833	66.06539
Jarque-Bera	1.110006	0.733006	11.93070	3.993326	21.63253	0.260965	14247.06
Probability	0.574071	0.693154	0.002566	0.135788	0.000020	0.877672	0.000000
Sum	117.7703	3.57E+13	32.82169	675.4568	78496.00	813.9873	28.39662
Sum Sq. Dev.	108.4235	8.23E+24	5.199182	8467.442	49848120	10893.73	1080.769

Source: Compiled from E-views Output

The statistical summary offers a detailed glimpse into the multifaceted dynamics of an economy, revealing nuanced patterns across various critical indicators. Inflation, averaging 6.93%, shows a distribution slightly skewed to the right,

suggesting a tendency towards moderate price increases. Conversely, the GDP, with an average of \$2.10 trillion, presents a relatively stable and symmetric distribution, reflecting a robust economic output. Foreign Direct Investment, at an average of 1.93, exhibits a right-skewed distribution, indicating variations in investment flows with some notable peaks. The average government debt stands at 39.73, showcasing instances of fiscal prudence alongside potential debt burdens, with some instances recording no debt at all. The number of listed domestic companies, averaging 4617.41, skews heavily to the left, indicating potential market concentration or regulatory constraints. Total stock value traded, with an average of 47.88, displays a marginally left-skewed distribution, while Return on Equity, at an average of 0.35, signifies potential profitability but also substantial variability, evidenced by significant right skewness. Notably, several indicators exhibit deviations from normality, as indicated by the Jarque-Bera test, underscoring the complexity of their distributions and the need for cautious interpretation. This broad analysis illuminates the intricate economic landscape, providing valuable insights for policymakers, investors, and analysts alike to navigate and understand the underlying forces shaping the economy.

5.2. TEST SUMMARY OF POOLED OLS REGRESSION MODEL

The regression analysis provides a nuanced understanding of the complex dynamics influencing Return on Equity (ROE), yet its explanatory capacity appears constrained by several factors. While the model elucidates relationships between ROE and various independent variables, such as inflation, foreign direct investment, and government debt, their effects are modest and often fail to reach statistical significance. Notably, variables like GDP, the number of listed domestic companies, and the total value of stocks traded exhibit negligible impact on ROE, implying that they may not be key drivers of profitability within the studied context. The model's overall significance, as gauged by the F-value (0.879172), suggests a weak fit, indicating potential inadequacy in capturing the intricate interplay of factors shaping ROE. Moreover, the negative adjusted R-squared (-0.010618) raises concerns regarding potential over fitting or the limited explanatory power gained from additional variables. Despite this, the Durbin-Watson statistic (1.992229) provides assurance of no significant autocorrelation in residuals, bolstering confidence in the model's reliability. Consequently, there exists a clear imperative for further refinement, necessitating a critical reevaluation of variable selection, potential inclusion of additional relevant factors, and investigation of alternative model specifications to enhance the predictive accuracy and explanatory depth of the analysis.

5.3. TEST SUMMARY OF FIXED EFFECT AND RANDOM EFFECT MODEL

	Co-efficient	t – value	Prob
C	5.837217	0.147009	0.8836
INFLATION	-0.087882	-0.064977	0.9484
GDP	1.22E-12	0.134015	0.8938
FDI	0.528020	0.129360	0.8975
GOVT. DEBT	-0.055288	-0.900002	0.3715
LISTED COMPANIES	-0.000398	-0.110392	0.9124
STOCKS TRADED VALUE	-0.105384	-0.759503	0.4504
Model Summary			
F-Value			0.879172
S.E. of regression			3.950500
R- Square			0.077262
Adj. R-Square			-0.010618
DW Statistic			1.992229
Source: Compiled from E-views Output			

	Fixed Effects Model			Random Effects Model		
	Co-efficient	t – value	Prob	Co-efficient	t – value	Prob
C	5.837217	0.147266	0.8835	5.837217	0.147266	0.8834
INFLATION	-0.087882	-0.065091	0.9483	-0.087882	-0.065091	0.9483
GDP	1.22E-12	0.134250	0.8937	1.22E-12	0.134250	0.8936
FDI	0.528020	0.129587	0.8974	0.528020	0.129587	0.8973
GOVT. DEBT	-0.055288	-0.901581	0.3713	-0.055288	-0.901581	0.3707
NO. OF LISTED COMPANIES	-0.000398	-0.110585	0.9124	-0.000398	-0.110585	0.9123

STOCKS TRADED VALUE	-0.105384	-0.760835	0.4501	-0.105384	-0.760835	0.4496
Model Summary				Fixed Effects Model	Random Effects Model	
F-Value				0.967652	0.882259	
S.E. of regression				3.943582	3.943582	
R- Square				0.211849	0.077512	
Adj. R-Square				-0.007082	-0.010344	
DW Statistic				2.361812	1.998905	
Hausman's Test						
Test Summary		Chi-Sq. Statistic		Chi-Sq. d.f.	Prob.	
Cross-section random		4.2773		6	0.3698	
Source: Compiled from E-views Output						

The dataset provides a detailed comparison between Fixed Effects and Random Effects models in predicting ROE using various independent variables. Across both the models, the coefficients offer nuanced insights into the impact of each variable on ROE. For instance, in the Fixed Effects model, the coefficient for inflation (-0.087882) suggests that a one-unit increase in inflation is associated with a decrease in ROE by approximately 0.088 units, while the coefficient for FDI (0.528020) indicates a positive effect on ROE. Similarly, in the Random Effects model, these coefficients remain consistent. However, despite the precision in estimating individual variable effects, both models exhibit relatively low adjusted R-squared values (Fixed Effects: -0.007082; Random Effects: -0.010344), implying limited overall explanatory power. Interestingly, the Hausman's Test, with a Chi-Square statistic of 4.2773, suggests that the Fixed Effects model might be more appropriate, given its lower p-value (0.3698). Nonetheless, the absence of significant autocorrelation in residuals, indicated by the Durbin-Watson statistic (Fixed Effects: 2.361812; Random Effects: 1.998905), bolsters confidence in the reliability of both models.

6. RESULTS AND FINDINGS

The regression analysis provides a detailed examination of the relationship between ROE and several key economic indicators, shedding light on the intricate dynamics shaping profitability within the studied context. Despite the comprehensive inclusion of variables such as Inflation, GDP, Foreign Direct Investment, Central Government Debt, Listed Domestic Companies, and Stocks Traded Total Value, the findings reveal a notable lack of statistically significant relationships with ROE. Each coefficient's respective t-values and p-values suggest that none of the independent variables exert a discernible impact on ROE at conventional levels of significance. This underscores the complexity of factors influencing profitability, suggesting that the variables considered in this analysis may not fully capture the nuanced interplay of economic forces at play.

Moreover, the model's overall descriptive power, as indicated by the F-values and Adjusted R-Square, is notably low across all specifications. The negative Adjusted R-Square values for the initial model and the Random Effects model further highlight the inadequacy of the regression models in explaining variations in ROE. While the Fixed Effects model yields a slightly positive Adjusted R-Square, suggesting a marginal improvement in explanatory power, it remains insufficient to provide a comprehensive understanding of the factors driving ROE. Despite these limitations, the Durbin-Watson statistic provides assurance of no significant autocorrelation in the residuals, bolstering confidence in the reliability of the models' estimates. However, the Hausman's Test results suggest no significant difference between the Fixed Effects and Random Effects models, indicating that both specifications may exhibit similar performance in capturing the relationship between the independent variables and ROE.

Furthermore, the insignificant coefficient estimates for each independent variable underscore the need for further exploration and improvement of the model. Potential avenues for improvement may include the contemplation of additional relevant factors not included in the current analysis, such as industry-specific variables, regulatory frameworks, or macroeconomic trends. Additionally, alternative modelling approaches, such as non-linear models or dynamic panel data techniques, could be explored to better capture the complex and dynamic nature of the relationship between economic indicators and ROE.

7. CONCLUSION

The findings of this study give evidence of the inability of the current model to explain the effect that selected macroeconomic variables might have on ROE for Indian listed companies during the period from 2014 to 2020. Common indicators like inflation, GDP, foreign direct investment, government debt, and listed company data are insignificantly statistically related to ROE, thus showing that the determinants of business profitability are complex. The negative values of the Adjusted R-Square in most of our models further point to variability in explanatory power and, therefore, reconsideration of the model variables and approach. Further research may develop predictive accuracy either through the addition of new factors such as industry-specific elements or influences by regulation or the use of nonlinear and dynamic panel data models.

CONFLICT OF INTERESTS

None.

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