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The Reliability of Corporate Zero-Default Debt

Hatem Elshreif, Finance Instructor
Cardiff School of Business
hatemelshreif@gmail.com (ESID 8830 3530 2023)

Abstract

Although corporate bankruptcy has been examined in terms of measurement and modeling, a question remains standing still: Is it worthy enough to predict the bankruptcy or will it be better to develop a tool to prevent it from the beginning?

Corporate bankruptcy techniques, models and theories focus on predicting the bankruptcy only rather than preventing bankruptcy which helps corporate managers take the right borrowing decision. The researcher believes that Corporate Debt Safe Buffer is a valid model in this respect.

This thesis tests a bankruptcy prevention model (Eldomiaty, et al., 2014) on the non-financial firms listed in DJIA30 and NASDAQ100 over the period 1999- 2016. The results provide a validation for this model with Trade off, Pecking Order and Free Cash Flow theories of capital structure as the results are quite significant and can be used for determining a debt ratio safe buffer.

The researcher uses the following statistical methods to test the new model Lagrange Multiplier Test, Cointegration Using Unit Root Test, Linearity versus Nonlinearity Test, Hausman Test. The results prove that: (a) firms tend to adapt a positive debt ratio safe buffer, (b) there is no significant difference between debt ratio safe buffer and the observed debt ratio.

The overall results show that the predication of bankruptcy is a helpful tool for credit rating agencies when evaluating corporate creditworthiness, although the model help avoiding bankruptcy.

Keywords:

Corporate Debt Safe Buffer, Corporate Bankruptcy



Introduction

The fundamental of any business is to secure funds from stakeholders to finance projects that will return profit to the stakeholders. In order to do this, there are two main sources for any firm to raise capital: equity and/or debt.

Equity financiers have the right in the ownership of the firm but do not have a sure profit. Equity finance come either from issuing stocks or using the firm's own retained earnings. Using retained earnings, means that the firm hold money that could have been returned to stockholders and uses it to finance capital projects.

On the other hand, debt financing is borrowing; investors have the right of fixed future payments, but not like the equity holders as they do not have any ownership privileges. Borrowing can be done from a financial intermediate, such as a bank, or directly by issuing bonds.

Both type of finance has its cost. Interest rate which the firm will pay to its debtors is the mainly the cost of debt. While the required rate of return which any investor expects for his money to finance any projects is mainly the cost of equity.

In reality, the capital structure of a firm portrays the path in which a firm raised capital expected to secure and grow its business exercises. It is a combination of different source of equity and debt.

Firms usually raise funds to buy assets in order to produce or sell goods. By nature, these assets are illiquid and cannot be sold easily or sold at less value. Holding of these specific assets means that if the firm goes bankrupt it will lose value. The firm with high debt increases the risk of bankrupt as it will force the firm to default on the debt or at least force the firm to make regular payments.

From the above we can consider that debt is a two-edged sword. Using reasonable debt level will increase the welfare. On the other hand, highly leverage firms can be disasters. Highly leverage firms usually lead to bankrupt and financial distress.

The main bankruptcy cost occurs when the ongoing business of the firm becomes disrupted by the process of bankruptcy, leading to decrease of the firm cash flow.

This can happen even when the firm loose its major customers or sold its assets with less value during the bankruptcy.

Basically the bankruptcy is a costly process itself because it het down the value of the firm dramatically beside the transmission of the ownership.

These costs are a financial cost, as the higher of the probability for the bankruptcy the higher the financial cost. When a firm threatened by the bankruptcy the debtor is most likely lose their money so they will ask for higher rate of return in such firms.

So simply we can say higher debt leads to higher probability of bankruptcy ending up with higher bankruptcy cost.

On the other hand, filling bankruptcy will lead to detrimental effect on the firm credit rating. Bankruptcy usually affect the credit score for the firm up to ten years. Also if the firm will not be filling bankruptcy by allowing its debts going to collections will affect the credit score as well.

Corporate financial distress usually leads to legality intervention. Along with the moral hazard implication of such actions, there are also a negative spillover into the real side of the whole economy.

Does the bankruptcy affect the whole economy?

Of course corporate bankruptcy has a vital effect on the economy as it usually increases unemployment rate and decreased consumer spending. In such emergent market like Egypt numerous corporate distress may result in economic crises.

Since the January 25th Revolution, however, bankruptcy reform has taken on new urgency. A report by CAPMAS showed that, under the effective bankruptcy law no. 785 firms were involved in bankruptcy cases during the first 10 months of 2011, a 26 percent increase compared to 2010. Also with economic activity still on the decline, this trend could continue well into 2012.

Providing a research highlighted the financial ratios and bankruptcy models to predict and avoid the bankruptcy risk for the listed firms in Cairo Stock market will be worthy.



There was a lot of studies which highlighted the bankruptcy risk, however in this paper the author will apply a new model "Corporate Debt Safe Buffer" to reach a significant

determinants of corporate capital structure to help managers predict and avoid the bankruptcy risk.

Research Statement

Despite the fact that there was a lot of researches, models and studies which highlighted the bankruptcy risk, all these related literatures were focusing on predicting rather than avoiding bankruptcy. The thesis offers a model that helps firms plan for a debt ratio associated with zero-probability bankruptcy."

Significance of the study

Due to the fact that numerous studies about the bankruptcy utilize the observed debt ratio as a measure of capital structure, a plausibility of insolvency risk arises. This measurement "observed debt ratio" may be sufficiently high to uncover, or really take, organizations to liquidation hazard.

In this study, the numerical calculation and estimation of the variables offer the benefit of utilizing the negative coefficient as intermediaries for bankruptcy risk. In the same sense, positive coefficients can be utilized for observing liquidation risks.

By using the zero default debt ratio, financial managers can have achieved a lot of benefit their shareholders and to the economy also given that the likelihood of insolvency is disposed of

Literature Review:

A review of the Bankruptcy Model:

Corporate bankruptcy is one of the problems that most concern financial theory. Many efforts and scarce progress; experimental design problem persists in the

models that have been raised, mainly for two reasons:

ignorance about the bankruptcy process that follows each company and for the exclusive use of the information accounting to conform these models.

Business success, effectiveness is important managers, just as companies should correspond the dynamism of the market resulting opportunities, but also risks to organizations. So the challenge to the managers. It is to adapt the company to the imponderables, both market and organizational, hampering such tasks. To do the preventive control is essential.

It was from the Z-score model that the financial estuary ponders the importance of having Prospective financial models that would help the managers in their tasks. Since then, they have developed a number of predictive models some ability to anticipate business failure, and its clear effect: bankruptcy.

Evidence suggests that the models seem unable to replicate outside companies control the predictive success. In large part, this failure may be due the exclusive use of accounting information for build all these models. Thus, the design of more complex and comprehensive models, which consider accounting not only information but information reflects the style and managerial way, it contributed the advancement and understanding of the phenomenon of bankruptcy Business.

Bankruptcy is a well-known phenomenon in business in which firms enter and exit the market as a result of its activity and expectations. When bankruptcy occurred significant creditors, financiers, investors and stakeholders loses will take place. Thus, a reliable bankruptcy prediction model which can predict financial distress as early as possible is badly needed to reduce such losses as it will provide warning signs so the firm management team can take the corrective action in time.

Bankruptcy is defined as the inability of a company to continue its current operations due to having high debt obligations¹. Altman 1968 agreed with this definition "bankruptcy occurs when companies are not capable of paying off their debts; therefore they cannot keep on with their activities"². While Gordon (1971) defined it as reducing of profiting power of companies where probability of disability in paying profit and original debt can be increased³. Also the firm failure takes the same definition when the firm could not pay its liabilities in

due time. Once one of these events happened bankruptcy, bond default, an overdrawn bank account, or stop paying dividend for preferred stock we can consider this as a firm failure.



As there is different economic bankruptcy definition, also the bankruptcy definition varies from country to country. In United States for example the proper legal chapters 7&11 define the bankruptcy according to set of conditions and situation firms can be in. On the other hand, there are three legal laws (the Civil Rehabilitation Law, the Corporate Reorganization Law and the Liquidation Law) define the bankruptcy in Japan. Despite the fact that there is a significant change must have done in bankruptcy exist law we find that Law No.17 of 1999 define the bankruptcy in Egypt. Furthermore, each study defines the bankruptcy according to the study scope. In this study the bankruptcy concept definition is similar to most of the studies and according to the Law no. 17 1999 which state that any Egyptian firm to be considered bankrupt when the traders stop paying his commercial debts caused by financial distress. So the traders within 15 days from the suspension of payments must file bankruptcy.

Although corporates in both developed and developing countries are subject to bankruptcy risk as it is a worldwide problem, it is more likely to happen in developing countries. Difference capital structure, adapted accounting standards, political and economic environment between countries are some key causes of bankruptcy risk. For example, the above mentioned causes are existing clearly when comparing between US firms and Egyptian ones.

In such emergent market like Egypt numerous corporate distress may result in economic crises. Since the January 25th Revolution, however, bankruptcy reform has taken on new urgency. A report by CAPMAS showed that, under the effective bankruptcy law no. 785 firms were involved in bankruptcy cases during the first 10 months of 2011, a 26 percent increase compared to 2010. Also with economic activity still on the decline, this trend could continue well into 2012.

Providing a research highlighted the financial ratios and bankruptcy models to predict and avoid the bankruptcy risk for the listed firms in Cairo Stock market will be worthy.

Significant number of research had been conducted over the past three decades with respect to the capability of financial ratios to predict corporate bankruptcy with more reliability. Most studies

Depended on the financial ratio derived from firm financial statement as the main sign for bankruptcy. They used mostly profitability, solvency and liquidity.

When tackling the different and various bankruptcy prediction models, they seems almost the same. In the following section we will try categorized the various models in the following categories:

Statistical Models

The main features of the statistical models that they are tend to focus on failure symptoms, alike most of these models under the statistical category they are follow classical standard process as they are drawn mainly from company account.

Under this section we can sub categories to the following:

- **Univariate Models**

Altman (1993), Morris (1998) are the two famous scholars who provide such models focusing on the financial ratio analysis challenging the idea if financial ratios shows differences reading between the bankrupted and non-bankrupted firms so they can be used as a predictive variable.

- **Multiple Discriminant Analysis**

To maintain a strategic distance from the conflicting of classification results of Univariates models, Altman (1968) conduct a linear grouping of certain discriminatory variables. He used this linear combination to classify corporate into bankrupted and non-bankrupted groups according to their different discrete features.

- **Logit Model**

It is a regression model with dependent variable is the bankruptcy probability to fill between 0 and 1 where 0

indicates bankruptcy and 1 indicate less probability for the firm to become bankrupt. Ohlson (1980) depend on three major ratios as the best indicator of bankruptcy

these ratios are: Working Capital to Total Assets, Net Income to Total Assets and Total Liability to Total assets.



- **Probit Model**

It is more similar to Logit similar but the main differences between them is that Probit model used when the dependent variables will provide only the value 0 and 1.

Non Parametric Models

The features of these kind of models are very close to the Statistical Models features as they are also focus on failure symptoms, drawn basically from company account, but due to the technological advancement Friedmann (1977) was one of among other researcher who developed these models using the computer technology.

Under this section we can sub categories to the following:

- **Recursive Portioning Algorithm**

The algorithm is a computer techniques and non-parametric technique in identifying pattern which has feature of multi-variable analysis and classifying a traditional variable.4

This sort of learning models is abused by decision tree systems that utilization recursive parceling choice standards to change data sample to end up with classifying firms to bankrupted or not.

The accuracy of this models exceed 90% and the most important predictor ratio is cash flow to total debts.

- **Neural Networks**

According Hertz, Krogh and Palmer (1991), Neural networks are calculation non-linear algorithms for processing numeric data. Several features of neural networks such as internal dynamic of neural networks in prediction, changes in information error and lack of

Need to added information on input data can make using neural network interesting in many problems.5

The main disadvantage of this model is hiding the network process to classify firms into bankrupted or not.

Theoretical Models

Statistical models tend to focus on the failure symptoms, can be univariate or multiple discriminants, based on account information and follow classical standard statistical process; however, the theoretical models focus on quantitative causes of failure, always multivariate, based on information rather than company accounts, and finally theoretical models adapt statistical techniques.

Under this section we can subcategories to the following:

Balance Sheet Decomposition Measures

The firms try to keep the equilibrium in their financial structures, so by examine the changes in firm's financial structures we can identify the bankruptcy.

According to Lev (1973), if significant changes are reported in the financial statement with regard to composition of assets and liabilities so the firm are away from keep the equilibrium. Furthermore, if these changes become out of control and increase over the time one can predict the bankruptcy. She reaches at the end of her study that the larger the decomposition measures for a firm the higher probability of bankruptcy.

Cash Management Theory

Cash management considers the short term management of firms cash balance.6

One of the famous bankruptcy prediction models include discriminant analysis model (Altman 1968), and Merton model (Merton 1974). These model were developed using single-data period of firms.

Altman used multivariate analysis to predict financial distress using a methodology that considers the combined influence of several financial ratios; namely, the "Z-score" model. The results of his paper showed

that financial ratios, can predict financial distress up to 95% in the first year. These five ratio used by Altman are:

1) Working capital / total assets *100%.

2) Retained earnings / total assets *100%.

3) EBIT / total assets *100%.



4) Market value of equity / book value of total debt*100%.

5) Sales / total assets*100%.

Moreover, Altman specified that failure or non-failure firms be likely to have different ratios, not that ratios have predictive power. The vital problem in his paper is to make an implication in the reverse direction, i.e., from ratios to failures (Chandra, 1997). Further, Brigham and Gapenski added that Z score analysis must be based on a similar characteristic between firms under study, because different conclusions for bankruptcy may vary from industry to others.

The papers written by White and Turnbull (1972), Santomero and Vinso(1977) can be considered as the first study which use systematic and logical probabilistic estimates of bankruptcy. Further, Shumway (2001) stated that hazard models are more accurate when predict bankruptcy than the statics models by Altman. In order to avoid inconsistent probability estimates when using single-period models, Shumway (2001) and Jarrow (2001) offered a discrete-time hazard model using multiple-period data for bankruptcy forecasting. Also Shumway pointed that several market variables such as market size, past stock returns are strongly correlated with bankruptcy probability.

A recent paper by Hillegeist et al. (2003) showed a different method to predict the bankruptcy. He matched the information about the probability of bankruptcy (PB) based on Merton's model, Z-Score based on discriminant analysis model, and O-Score derived from Ohlson (1980). He found that PB based on Merton model provides considerably more information than Z-Score and O-Score.

In this paper, PB got from the single-period Merton model (PB-Merton) is contrasted and that got from the discrete- time risk model DHM (PB-DHM) on their data content about firm's technical incompetence. A firm is considered as technically incompetent if it is not able to achieve maximum yield given its available resources and technology.

Yet and when qualitative information is not providing partial information, like information accounting, theorists agree that the mixture of these two types of information in predictive models strengthens their

predictions. Thus, although the importance of the ratios in the study of failure Business cannot be denied, its use has been others criticized, mainly for the following:

A. Hypotheses, which are made with financial ratios that do not have a theory that justifies use and, in turn, models and results of these stem simply be a statistical exercise.

B. These models are unable to predict the bankruptcy of those companies that have high credit ratings because they omit one or more important, such as the ratio of risk-return elements properly.

These two circumstances give rise to the following reasoning:

1. Constraint. Since the obligation to present public accounting information and processing size type depends company based criteria, prediction models of business failure using ratios are restricted and therefore data for these companies who know the criteria.

2. Fair presentation. When developing models prediction is based on financial ratios, researchers implicitly assume that the annual accounting information provides the faithful and true picture of the situation Financial Company. We must recognize there is not flawed accounting information you can provide real business image. Rosner (2003) found evidence that failed companies manage earnings upward to give a positive image about your situation financial, especially when they are the brink of failure.

3. Bias. From the moment that researchers introduced only financial ratios to their predictive models, they assume that the relevant indicators, whether of failure or success, they are captured by the accounting information. The Experience shows that not all information relevant is included in the financial statements; Of course, if the financial statements do not provide all the required information is generated problems of missing values. Argenti (1976) says that

"despite of financial ratios that can show that something is wrong ... I doubt that anyone would dare to predict the collapse or failure with the only evidence of these ratios". Meanwhile, Maltz, Shenhar and Reilly (2003) demonstrated empirically that the use of financial measures as indicators unique performance of the organization is limited.



In the Middle East several researches worked on the bankruptcy predictions. Corporate Debt Safe Buffer is a recent model which has been developed in Feb, 2014 by Eldomiaty, T. Mostafa, W. and Attia, O. In their working paper they focus on develop a model lead to significant determinates of corporate capital structure which can help companies avoid the bankruptcy risk. Debt ratio safe buffer is the difference between

zero-default debt ratio and their observed debt ratio, the higher the ratio the more efficient of capital structure and higher wealth. They apply this model on the firm listed in DJIA30 and NASDAQ100 on quarterly based from 30th June 1989 till 31st March 2011. The general findings show that the coefficient of speed of adjusting debt ratio safe buffer in a previous quarter to a target debt ratio safe buffer was relatively high which means that firms understudy adapt debt ratio in a way that does not expose the firm bankruptcy risk. On the other hand, they conclude that the trade-off and pecking-order theories are relatively applied to their findings.

The relationship between debt financing and the probability of bankruptcy

Obviously bankruptcy related problems are correlated to debt, the more debt a firm has on its capital structure the more bankruptcy risk it should have. Therefore, bankruptcy related costs holding up financial managers from pushing their use of debt to excessive levels.

Moreover, bankruptcy related costs have two main drivers:

- 1- The probability of their occurrence.
- 2- The cost that will be incurred when bankruptcy arises.

Financial distress does not occur all of a sudden, there are some signs it which indicate to the management of

the firm to limit their use of debt. Some of these common signs of sickness are:

- 1- Volatility of earnings.

- 2- Highly operating leverage.

- 3- Firms with illiquid assets.

Modigliani and Miller (1958) develop the trade-off theory to preceding this argument. They stated that firm's trade off the tax benefits of debt financing against the problems caused by bankruptcy probability. Enjoying the tax shelter benefits encourage firms to use more debt i.e. more debt reduces taxes and thus allows more of the firm's operating income to flow through to investors. Therefore, MM's original paper encourage firms to maximized using of debt to 100%.

However, in real world, this assumption does not hold true as firms tend to reduce the financial leverage to limit the adverse effect of potential bankruptcy. For example, debt costs rise as the debt ratio rises, expected tax rates fall and reduce the value of tax shelter and the probability of bankruptcy increases as the debt level rises.

MM's irrelevance results also depend on the assumption that firms do not go bankrupt and hence that bankruptcy costs are irrelevant. In real live bankruptcy exists and costly. Financial distress has a high legal and accounting costs. In addition, financial distress often forces a firm to liquidate assets at firs price.

Research Objective

This paper will be valuable especially that the bankruptcy risk after the Egyptian Revolution is still threating the financial performance of the firms working within Egypt.

Beside that and according to the above introduction multiple corporate bankruptcy will affect the whole economy by increasing the unemployment rate losses for shareholders and inevitably will lead to losses to the national economy. So, this paper will try to use recognized financial ratios and models to forecast corporate bankruptcy which could help moderate losses and provide better understanding of the survival of such firms. Accordingly, this research has many objectives.



- 1- Examine the validity of the corporate debt safe buffer model on the Egyptian market.
- 2- Elaborate fundamental factors which can guide the financial manager before the borrowing decisions.
- 3- Estimate the debt ratio associated with zero default probability.

Research Questions:

To what extent, we can depend on the debt ratio safe buffer as a benchmark for borrowing decision for the Egyptian corporate.

To what extent, we can monitor bankruptcy default probability in Egypt using the debt ratio safe buffer.

To what extent, this model will prevent the occurrence of bankruptcy.

H1: There is a difference between debt ratio safe buffer and the observed debt ratio.

H2: The firms under study tends to adapt a positive debt ratio safe buffer.

H3: Trade off, Pecking Order and Free Cash Flow theories are quite significant and can be used for determining a debt ratio safe buffer.

Although corporates in both developed and developing countries are subject to bankruptcy risk as it is a worldwide problem, it is more likely to happen in developing countries. Difference capital structure, adapted accounting standards, political and economic environment between countries are some key causes of bankruptcy risk. For example, the above mentioned causes are exist clearly when comparing between US firms and Egyptian ones.

Research Methodology:

- Type of Data

Secondary data

-Data

This study uses data for the firms listed in EGX 100. The data cover the period from 2000 till 2013. The methods of estimation include (a) tests for linearity

versus non-linearity, (b) tests for normality, c) tests for fixed versus random effects, (d) Cointegration analysis in order to test for model specification and (e) classical regression in order to examine the determinants of 'Debt Ratio Safe Buffer.'

Dependent Variables:

Debt Ratio Safe Buffer which is equal to the difference between zero-default debt ratio and their observed debt ratio.

Zero- default debt ratio = $DR_{zero\ default} = VA \times N \{d1\} - VE TA \times e^{-rt}$

Observed Debt Ratio = $DR_{observed} = LTDTA$



Independent Variables:

Determinants of capital structure as shown in the following table.

Determinants of Capital Structure	Variables / or proxy
Target Debt Ratio	DE_{t+1} (Debt/Equity)
	ΔDR_t (Total Debt Ratio)
Average Industry Leverage	ΔDR_{AVG} (Industry Debt Ratio)
Structure of Tangible Assets	$FATA_t$ (Ratio of fixed assets/Total Assets)
Relative Tax Effect	$\Delta ND TAX_t$ (The ratio of depreciation to total assets)
	$ECTR_t$ (The effective corporate tax rate)
	$\Delta NDTA_t$ (Direct Estimate of non-debt tax shields)
Growth	$CETA_t$ (Capital Expenditures over Total Assets)
	GTA_t (Growth of Total Assets = percentage change in total assets)
	SG_t (Sales Growth)
	$ASTURN_t$ (Assets Turnover)
Investment Growth Opportunities	Market-Book Ratio MB_t (Dummy variables)
Bankruptcy Risk	BR_t (A direct measure of bankruptcy risk)
	DCR_t (Debt Coverage Ratio)
Agency Cost	ER_t (Expense Ratio = Operating expenses scaled by annual sales)
	AUR_t (Assets Utilization Ratio = Annual sales/Total assets)
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Uniqueness	SES_t (Selling Expenses over Sales)
Industry Classification	IC_t (Dummy variables, 0-1 for the type of industries)
Size	$LnAssets_t$, the natural logarithm of total assets (Dummy variable).
Profitability	$\Delta EBITDA_t$ (Earnings Before Interest, Taxes, and Depreciation/ Total Assets)
	ΔOIS_t (Operating Income over Sales)
	ΔOIA_t (Operating Income over Total Assets)
	ΔPM_t (Profit Margin)
	ΔROI_t (Return on Investment)
Financial Flexibility	REA_{t+1} (The expected effect of Retained Earnings Ratio as a proxy for the retention rate)
	ΔREA_t (A measure of the cumulative effect retained earnings, thus the extent of firm's financial flexibility)
Liquidity Position	ΔQR_t (Quick Ratio)
	ΔWCR_t (Working Capital Ratio)
	$\Delta CashR_t$ (Cash Ratio)
	ΔCR_t (Current Ratio)
Interest Rate	IR_t (Interest Rate on bank loans)
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Timing Effect	ΔPE_t (Price/Earnings Ratio)
Transaction Costs	DPR_t (Dividend Payout Ratio)
Free Cash Flow	FCF_t (Operating Free Cash Flow)

Findings

Needless to say, bankruptcy is a term used when a business cannot repay their outstanding debts. This is imposed due to excess managerial borrowing. However, and as a matter of fact, the manager is, in most cases, blameless on the grounds that it is not logical that a manager seeks bankruptcy. To elaborate, the bankruptcy process is common owing to the fact that the manager doesn't have a bench mark. In other words, there is no alternative mechanism to prevent bankruptcy the moment this process begins.

To clarify, existing models are purely for prediction since they foretell the likelihood of bankruptcy before it happens. Nevertheless, when bankruptcy process is initiated, it seems impossible to cease it because the decisions had already been made and there is no way to resolve them. At the same time, if a mechanism was established to prevent bankruptcy during its process, it would be far more beneficial, and this is what Corporate Debt Safe Buffer is representing.

Conclusion

The structure of capital in companies has been a subject of extensive study and argument, since the two propositions of Miller and Modigliani, which has led to the development of theories and models that seek to explain the choice of a certain combination of capital and debt bearing in mind the default risk for the company. Since then, studies have focused on checking whether there is indeed an optimal capital structure, as well as in identifying the determinants of the capital structure. In the context of the imperfections of the real market, they have been proposed several theories, highlighting three: The theories of Trade Off, Pecking Order, and Free Cash Flow. In recent years, trends are focused on validating some of these theories, to verify if there is indeed a capital structure objective or, at least, preferences for a level of indebtedness.

Capital structure is a crucial decision must be taken by managers which they are seeking maximizing the wealth of the company. According to Kennedy Prince Modugu (2013) none of the traditional capital structure theories has a fixed point view of the optimal capital structure and he argued that managers must be very careful when they choose the right mixture of debt and equity.

In this sense the researcher believe that managers are facing default risk in order to maximize the wealth of the shareholders when trying to reach the optimal capital structure and he strongly believe that debt ration safer buffer model will be their desired destination.

In this thesis, the researcher compares between two models (Observed Debt Ratio and Default Risk-free Debt Ratio) and their relation with the determines of capital structure as pointed by the three major capital structure theories Trade Off, Pecking Order, Free Cash Flow. The Methodology in this paper present evidence that the two models are:

- The variances of the two models differ significantly when applying Lagrange Multiplier Test.
- The determinants of capital structure are cointegrated with the two models according to Cointegration Using Unit Root Test.
- The RESET test shows that the assumption of a linearity model fits the data.
- Hausman Test shows that both regression models are subject to random effect.

On the other hand, it shows a validation of the three capital structure theories understudy in this paper. The results report that trade off, Pecking Order, Free Cash Flow theories can be used for determining the debt safe buffer ratio to avoid or minimizing the default risk which managers can used for better borrowing decisions



Future Research & Recommendations

All bankruptcy prediction models have the same motivation, but the way to attack the problem is radically different and the results obtained are also very different. Univariate models are very simple, but lack generality. For example, an analysis of several ratios for a company can deliver contradictory results or it could happen that a ratio being relevant to one industry, not for another. The logical extension is multivariable models, both those based on MDA (Altman), in logit / probit (Ohlson), such as those established with Neural Networks, which occupy financial information to generate their bankruptcy predictions.

One of the criticisms that are made to this type of models is that they are not based on an economic or financial theory, since the relationship between the variables and the result is constructed by empirical procedures. Another inevitable criticism is found in the nature of accounting information: a bankruptcy prediction model attempts to decipher the future financial health of the company and the accounting data are, by construction, referring to the past.

Secondly, the biggest problem with this type of model is that it requires a market benchmark, which makes it impossible for companies that do not trade on the stock market

and here the researcher believes that the debt ratio safe buffer model will solve this and can be used as the required benchmark for best borrowing decision. Although the researcher applies the model on a very sophisticated data and prove that the managers for firms in this study take default risk into consideration to the extent that the observed debt ratio is very close to the default risk-free debt ratio. The researcher suggests that these models must be applied on both developing and devolved counties in order to validate the model word wide. Another issue this model need to be practically used inside the companies. One the other hand, the researcher suggests use the model as a benchmark for Altman bankruptcy prediction model to enhance the use of it.

The researcher suggests to extend this model to be applied on the small and medium enterprise where the probability of failure is much higher as there is no single application for small and medium enterprises up to this minute

Future research is also needed to validate the Corporate Debt Safe Buffer model in other countries and it will be highly recommended to Future work should also test the model with bankrupted companies.

It is recommended that the models in this research come into use to prevent the companies' bankruptcy and their results be applied to decision-making. In the same sense it will be highly recommended to the Egyptian Stock Market to work on providing reliable data to gain the benefit from such study to help companies applying the model to avoid the financial

distress and its subsequences which will affect the stakeholders and the whole economy. Finally, it is also recommended that these models should be developed and retested in later years, so that the results will be more reliable.



REFERENCES:

- Ahmed AHMADPOUR HASGARI (2013), A review of Bankruptcy and its prediction, International Journal of Academic Research in Accounting, Finance and Management Sciences, Vol.3 No4, pp.274-277
- Akhtar, S. and Oliver, B. 2009. Determinants of Capital Structure for Japanese Multinational and Domestic Corporations. International Review of Finance, 9(1-2):1-26.
- Ali, A., A. Klein, and J. Rosenfeld. 1992. Analysts' use of information about permanent and transitory earnings components in forecasting annual EPS. The Accounting Review 67 (1): 183-198.
- Altman, E. (1968). Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy. Journal of Finance. 23 (4), 581-609
- Altman, Edward I., Andrea Resti and Andrea Sironi, 2006, Default Recovery Rates: A Review of the Literature and Recent Empirical Evidence. Journal of Finance Literature, 1 (winter): 21-45.
- Anderson, T. W., and Darling, D. A. 1952. Asymptotic theory of certain 'goodness-of-fit' criteria based on stochastic processes. Annals of Mathematical Statistics, 23(2): 193-212. Anderson, T. W., and Darling, D. A. 1954. A test of goodness-of-fit. Journal of the American Statistical Association, 49 (268): 765-769.
- Antoniou, A., Guney, Y., and Paudyal, K. 2008. The Determinants of Capital Structure: Capital Market-Oriented versus Bank-Oriented Institutions. Journal of Financial and Quantitative Analysis, 43(1): 59-92.
- Araten, M., M. Jacobs and P. Varshny, 2004. Measuring LGD on Commercial Loans. The RMA Journal, May.
- Asarnow, E, and D. Edwards, 1995. Measuring Loss on Defaulted Bank Loans: a 24 year Study. Journal of Commercial Bank Lending, 77(7): 11-23.
- Ayaydin, O. A., Florackis, C. and Ozkan, A. 2014. Financial flexibility, corporate investment and performance: evidence from financial crises. Review of Quantitative Finance and Accounting, 42(2): 211-250.
- Bakshi, G., D. Madan, F. Zhang, 2001. Understanding the Role of Recovery in Default Risk Models: Empirical Comparisons and Implied Recovery Rates. Finance and Economics Discussion Series, 2001-37, Federal Reserve Board of Governors, Washington D.C.
- Black, F. and Scholes M. 1973. The pricing of options and corporate liabilities. Journal of Political Economy, 81(3): 637-654.
- Booth, L., Aivazian, V., Demirguc-Kunt, A., and Maksimovic, V. 2001. Capital Structure in Developing Countries. The Journal of Finance, 56(1): 87-130.
- Carey, M. and Gordy, M. 2003. Systematic Risk in Recoveries on Defaulted Debt, mimeo, Federal Reserve Board, Washington.
- Castanias, R. 1983. Bankruptcy Risk and Optimal Capital Structure. The Journal of Finance, 38(5): 1617-1635.
- Chabane, A., Jean-Paul, L. and Salomon, J. 2004. Double Impact: Credit Risk Assessment and Collateral Value. Review of Finance, 25(1): 157-78.
- Chang, S. C., Chen, S. S., Hsing, A. and Huang, C. W. 2007. Investment opportunities, free cash flow, and stock valuation effects of secured debt offerings. Review of Quantitative Finance and Accounting, 28(2): 123-145.
- Chang, C. and Yu, X. 2010. Informational Efficiency and Liquidity Premium as the Determinants of Capital Structure. Journal of Financial and Quantitative Analysis, 45(2): 401-440.
- Dreyer, J. 2010. Capital structure: Profitability, earnings volatility and the probability of financial distress. Unpublished MSc, Gordon Institute of Business Science, University of Pretoria.
- Dullman, K. and Trapp, M. 2004. Systematic Risk in Recovery Rates - An Empirical Analysis of U.S. Corporate Credit Exposures. EFWA Basel Paper.
- Eales, R. and Bosworth, E. 1998. Severity of Loss in the Event of Default in Small Business and Large Consumer Loans. The Journal of Lending and Credit Risk management, May, 58-65.



Rates on North American Syndicated Bank Loans, 1989-2003, Moody's Investors Service.

Eldomiaty, T. and Ismail, M. 2009. Modeling capital structure decisions in a transition market: empirical analysis of firms in Egypt. *Review of Quantitative Finance & Accounting*, 32(3): 211-233.

Eldomiaty, T. Mostafa, W. and Attia, O. 2014. Empiricism of corporate debt safe buffer. *Misr International University Faculty of Business Administration and International Trade*.

Fattouh, B., Harris, L., and Scaramozzino, P. 2008. Non-linearity in the determinants of capital structure: evidence from UK firms. *Empirical Economics*, 34(3):417-438.

Frankel, R. and Lee, Charles M. C. 1998. Accounting Valuation, Market Expectation, and Cross-Sectional Stock Returns, *Journal of Accounting and Economics* 25(3): 283-319.

Fridson, Martin S., Garman, Christopher M. and Okashima, K. 2000. Recovery Rates: The Search for Meaning, Merrill Lynch & Co., High Yield Strategy. Frye, J. 2000. Depressing Recoveries, Risk, November.

Gaud, P., Jani, E., Hoesli, M. and Bender, A. 2005. The Capital Structure of Swiss Companies: an Empirical Analysis using Dynamic Panel Data. *European Financial Management*, 11(1): 51-69.

Geske, R. 1977. The Valuation of Corporate Liabilities as Compound Options, *Journal of Financial and Quantitative Analysis*, 12(4): 541-552.

George, T. J., Kaul, G. and Nimalendran, M. 1991. Estimation of the Bid-Ask Spread and its Components: A New Approach. *Review of Financial Studies* 4(4): 623-656.

Glosten, L. R. and Harris, L. E. 1988. Estimating the Components of the Bid/Ask Spread. *Journal of Financial Economics*, 21(1): 123-42.

Gordon, M.J. (1971). Towards Theory of Financial Distress. *The Journal of Finance*, pp. 74-56.

Hertz, J., Krough, A., and Palmer, R., (1991), *Introduction to the Theory of Neural Computing*, NY: Addison Wesley.

Assessing the Probability of Bankruptcy. Working Paper, Kellogg School of Management, Northwestern University.

Hu, Yen-Ting, and Perraudin, W. 2002. The Dependence of Recovery Rates and Defaults. Birkbeck College, mimeo, February and CEPR Working Paper.

Huang, R. D. and Stoll, H. R. 1997. The Components of the Bid-Ask Spread: A General Approach, *Review of Financial Studies* 10(4): 995-1034.

Hol, S., Sjur Westgaard and Nico van der Wijst. 2002. Capital structure and the prediction of bankruptcy, Working Paper, Norwegian University of Science and Technology, Department of Industrial Economics and Technology Management.

Jaggi, B. and Gul, F. A. 1999. An Analysis of Joint Effects of Investment Opportunity Set, Free Cash Flows and Size on Corporate Debt Policy. *Review of Quantitative Finance and Accounting*, 12(4): 371-381.

Jarrow, Robert A., 2001. Default Parameter Estimation Using Market Prices. *Financial Analysts Journal*, 57(5): 75-92.

Jokivuolle, E. and Peura, S. 2003. Incorporating collateral value uncertainty in loss given default estimates and loan-to-value ratios. *European Financial Management*, 9(3): 299-314.

Jun, A. G. and Jen, F. C. 2003. Trade-off model of debt maturity structure. *Review of Quantitative Finance and Accounting*, 20(1): 5-34.

Keisman, D. and Marshella. T. 2009. Recoveries on Defaulted Debt in an Era of Black Swans. *Moody's Global Corporate Finance*, Moody's Investments Service, June.

Kahya, E. and Theodossiou, P. 1999. Predicting corporate financial distress: A time-series CUSUM methodology. *Review of Quantitative Finance and Accounting*, 13(4): 323-345.

Kane, G. D. and Richardson, F. M. 2002. The relationship between changes in fixed plant investment and the likelihood of emergence from corporate financial distress. *Review of Quantitative Finance and Accounting*, 18(3): 259-272.

International Journal of Automation & Digital Transformation

Emirates Scholar

Hillegeist, Stephen A. and Keating, Elizabeth K. 2003.

Kozioł, C. 2013. A simple correction of the WACC



discount rate for default risk and bankruptcy costs. Review of Quantitative Finance and Accounting, Forthcoming
(<http://link.springer.com/article/10.1007/s11156-013-0356-x>).

Lachmann, Ludwig M. 1978. Capital and Its Structure. Institute for Humane Studies, Sheed Andrews and McMeel, INC, Kansas City.

Lennox, C. 1999. Identifying Failing Companies: A Reevaluation of the Logit, Probit and DA Approaches. Journal of Economics and Business, 51(4): 347-364.

Lev, B. (1973), "Decomposition measures for financial analysis", Financial Management, Spring, pp. 56-63.

Lin, J., Sanger, G. and Booth, G. G. 1995. Trade Size and Components of the Bid-Ask Spread, Review of Financial Studies 8(4): 1153-1183.

Madhavan, A., Richardson, M. and Roomans, M. 1997. Why Do Security Prices Change? A Transaction-Level Analysis of NYSE Stocks. Review of Financial Studies 10(4): 1035-1064.

Madan, D., and Unal, H. 1998. Pricing the Risks of Default. Review of Derivatives Research, 2(2-3): 121-160.

Merton, Robert C. 1974. On the Pricing of Corporate Debt: The Risk Structure of Interest Rates. Journal of Finance, 29(2): 449-471

Myers, S. C. 1977. Determinants of corporate borrowing. Journal of Financial Economics, 5(2):147-175.

Myers, S. C. 1984. The capital structure puzzle. Journal of Finance, 39(3): 574-592.

Myers, S. C. 2001. Capital Structure. The Journal of Economic Perspectives, 15(2): 81-102.

Neto de Carvalho and Jean Dermine, 2003, "Bank loan losses-given-default - empirical evidence, "Working Paper, INSEAD.

adjustment to long-run target: evidence from Canadian firms. Applied Economics Letters, 17(10): 983-990.

Noulas, A. and Genimakis, G. 2011. The determinants of capital structure choice: evidence from Greek listed companies. Applied Financial Economics, 21(6): 379-387.

Ojah, K. and Manrique, J. 2005. Determinants of corporate debt structure in a privately dominated debt market: a study of the Spanish capital market. Applied Financial Economics, 15(7): 455-468.

Ozkan A. 2001. Determinants of capital structure and adjustment to long-run target: Evidence from UK company panel data. Journal of Business Finance and Accounting, 28(1-2): 175-198.

Panno, A. 2003. An empirical investigation on the determinants of capital structure: the UK and Italian experience. Applied Financial Economics, 13(2): 97-112.
Pykhtin, M. 2003. Unexpected recovery risk. Risk, 16, 74-78.

Pongsatit, S., Ramage, J., & Lawrence, H. (2004). Bankruptcy prediction for large and small firms in Asia: a comparison of Ohlson and Altman. Journal of Accounting and Corporate Governance, 1(2), 1-13.

Schuermann, Til, 2004. What Do We Know About Loss Given Default?, in D. Shimko (ed.), Credit Risk Models and Management, 2nd Edition, London, UK, Risk Books, 2006.

Saita, L., 2006. The Puzzling Price of Corporate Default Risk, Stanford University, working paper.

Shumway, T. 2001. Forecasting Bankruptcy More Accurately: A Simple Hazard Model, Journal of Business.74(1): 101-124.

Somerville, R. A. and Taffler, R. J. 1994. The predictability of debt-servicing difficulties among less developed countries. Review of Quantitative Finance and Accounting, 4(4): 339-356.

Thomas, S., 2003. Firm Diversification and Asymmetric Information: Evidence from Analysts' Forecasts and Earnings Announcements. Journal of Financial Economics, 64(3): 373- 396.



Emirati Journal of Business, Economics, & Social Studies

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Turetsky, Howard F. and McEwen, Ruth A. 2001. An empirical investigation of firm longevity: A model of the ex ante predictors of financial distress. *Review of Quantitative Finance and Accounting*, 16(4): 323-343.

Tsai, S. C. 2005. Dynamic Models of Investment Distortions. *Review of Quantitative Finance and Accounting*, 25(4): 357-381.

Van der Waerden, B. L. 1927. Beweis einer Baudetschen Vermutung, *Nieuw Archief voor Wiskunde* 15:, 212-216

Van der Waerden, B. L. (1930). *Moderne Algebra*, volume 1. Julius Springer, Berlin, 1st edition.

Van der Waerden, B. L. (1931). *Moderne Algebra*, volume 2. Julius Springer, Berlin, 1st edition.

White, R. W. and Turnbull, S. M. 1974. The probability of bankruptcy for American industrial firms, Working Paper IFA-4-74, London Graduate School of Business Studies, London.