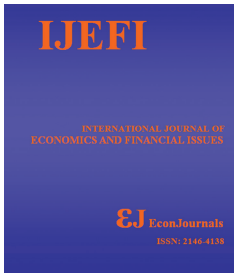

International Journal of Economics and Financial Issues

ISSN: 2146-4138

available at http: www.econjournals.com

International Journal of Economics and Financial Issues, 2017, 7(3), 706-712.

Bankruptcy and Insolvency: An Exploration of Relevant Theories

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ABSTRACT

The essence of the law on bankruptcy is to collect the debt of an entity and distribute such asset among the contending claimholders. It is, also meant to resolve the broad issues of business failure in the context of the imminent or indeed the actual collapse of the indebted entity. The objective of the study is to explore relevant theories guiding the procedure of distribution or entitlement in bankruptcy among a group of agents. The study employed exploratory research method via an extended literature review, to investigate the underlying principles guiding the allocation of a given amount of a perfectly divisible good among a group of agents. The results of this extended literature review indicate that the procedure of distribution or entitlement in bankruptcy is supported by five of the theories reviewed while only value based theory posits the absence of any cogent solution to the financial distress of the debtor. The knowledge of theories is not enough for business survival, the ability to predict the possible occurrence of business failures is necessary. Market based models including the stock market option valuation approach perform better than the earlier models which rely heavily on historical accounting figures.

Keywords: Bankruptcy, Bankruptcy Theories, Exploratory Research, Genetic Programming Model
JEL Classifications: G33, KII, K12

1. INTRODUCTION

The term "bankruptcy" originates from the mixture of *bancus* and *ruptus,* Latin words for "bench or table" and "broken" respectively. This is, said to arise from the inability of a banker, who in the beginning transacted his business in the marketplace on a workbench, to meet his contractual obligations. Symbolically, his bench is, considered broken (New Generation Research, Undated). The term is, also believed to have roots in *banco rotto,* from the medieval Italy, roughly translated to mean "broken bank." Similar speculation on the origin word is, ascribed to the French expression *banque route*, a metaphorical practice of leaving a sign at the site of an abandoned banker's table.

The idea of debt forgiveness can be, traced back to the Bible in the Old Testament wherein once every 50 years, a Jubilee year is, observed. During the holy year, all debts would be, eliminated and those Israelites that had sold themselves into slavery would be freed. In addition, all land that had been, sold to revert to its original owner (The Bible, Leviticus 25. p. 10-13).

The frequency of the debt forgiveness period was indeed increased in provide that all debts are with respect to fellow Israelites, considered cancelled at the end of every 7 years. In effect, the forgiveness of debt is limited to the Jew nationals. In ancient Greece, however debt forgiveness was an unfamiliar concept. A debtor's inability to meet his obligation would mean that he together with all his family members, servants became debt-slaves who must provide physical labour services until the debt is, fully repaid (The Bible, Deuteronomy 15. p. 1-2).

The Quran provides opportunity for the debtor to be given time to offset his debts. The second chapter, Sura Al-Baqara provides that: "And if someone is in hardship, then let there be postponement until a time of ease. But if you give from your right as charity, then it is better for you, if you only knew" (Quran, 2. p. 280). Indeed, al-Maqrizi as cited by Rosenthal (2013), in the documentation of bankruptcy in East Asia mandated the death penalty for anyone who became bankrupt 3 times.

In the United States of America, the initial federal laws on bankruptcy were enacted in response to difficult economic

conditions. The first official bankruptcy act enacted in 1800 dealt with land speculation. The latest amendments to the federal rules of bankruptcy make it costlier for debtors to file for bankruptcy. Such defaulting Americans debtor are made to settle some portion of their indebtedness (Bankruptcy Abuse Prevention and Consumer Protection Act – BAPCA, 2005).

Whereas insolvency and bankruptcy are applicable to individuals and partnership. Liquidation is applicable to companies and is a process of winding up a company because of its inability to meet its obligations as at when due. A corporate body, which is, unable to pay his creditors is termed insolvent. Consequently, its assets may be, deposed to settle its indebtedness (Companies and Allied Matter Act, 1990 s. 409 and Investments and Securities Act, 2007, s. 122).

The main objective of the bankruptcy law is the provision of protection and relief to indebted entities. It is also offers the means of equitable distribution a debtor's assets among all creditors. The law is, also designed to prevent a potentially fraudulent action, which is capable of undermining its objectives.

Bankruptcy may be, categorised into involuntary and voluntary bankruptcy. Insolvency is the inability of an organization/company to pay its debt. When such a company is unable to pay as at when due, an equitable insolvency is said to critalize. A balance sheet insolvency occurs when the assets of a debtor is exceeded by its liabilities which indeed may result in cash crunch and limit the ability of the debtor to meet its obligations.

> The Nigerian Bankruptcy Act 1990 (part A, (1)) provides that a, "debtor commits an act of bankruptcy if a creditor has obtained a final judgment or final order against him for any amount, and execution thereon not having been stayed, has a bankruptcy notice served on him."

The bankrupt status becomes firm if the debtor is unable to comply with the notice provisions, within 14 days after service of the notice. The debtor may willingly presents a bankruptcy petition against himself by filing in the court of competent jurisdiction, a sworn affidavit declaring his inability to pay his debts. The Nigerian Bankruptcy Act (1990) is, designed to provide relief and protection to insolvent debtors and bankruptcy companies whilst providing fair and equitable channel of applying the assets to meet the claims of all creditors, as much as possible. The latest enactment in this regard is the Asset Management Act 2010, which empowers a special purpose vehicle AMCON to buy up debts of defaulting bank customers. However, in the view of Opara et al. (2014), Nigeria lack the enabling bankruptcy regulations, sufficiently robust enough to meet the modern day challenges of the Nigerian environment.

It appears that the theoretical underpinning of the concept have been under explored in the literature, which sees bankruptcy mainly as a practical and legal matter. The objective of the study therefore, is to explore relevant theories guiding the procedure of distribution or entitlement in bankruptcy among a group of agents. The study employed exploratory research method in achieving the stated objective. The first step is the discussion of the bankruptcy problem, which is presented next.

2. THE BANKRUPTCY PROBLEM AND CONSEQUENCES

The bankruptcy problem is an entitlement distribution delinquency concerning the sharing of a perfectly dividable commodity entitled agents. The emphasis in this case is on the situation of insufficiency in satisfying all their demands. The would-be bankrupt firm or individual to be, liquidated would insufficient liquid asset that will go round the creditors. The bankruptcy problem deals with how to divide the asset among all creditors. A bankruptcy problem is a pair (A, d) where $d = (d_1, . ,d_n) \geq 0.0 \leq A \leq \sum_{i=1}^{n} d_i$, d signifies the total estate value and c is the vector of the creditors' claims.

The summation of these claims is, denoted by D.

In order to share the limited assets amongst claimants, there is the need for allocation. The apportionment in such a problem is an n-tuple $x = (x_i,\ldots,x,) \varepsilon R^n$ with $D = \sum_{i=1}^{n} x_i \;\; 0 \leq x_1 \leq d_1, i = 1,.., n.$

In an allocation rule, a function that assigns a unique allocation to each bankruptcy problem denotes the set of all creditors by N.

Aumann and Maschler (1985) identify three practical approaches for resolving bankruptcy problems. However, each method is deficient in one or more ways. The methods are the proportional rule where the available assets are, divided proportionally to each creditor's claim. The first, proportional rule is, symptomatically defined as follows:

$$gP^n(A, d) = AD, \text{ where } AD = A \tag{1}$$

In the second approach, the constrained equal-awards rule shares the assets equally among the claimants, nobody however gets more than their entitlement/claim. The constrained equal award (CEA) rule is, defined as:

$$g^{CEA}(A, d) = x_i \tag{2}$$

Where, $A = \sum_{i=1}^{n} \min(\lambda, d_i)$ and $x_i = \min(\lambda, d_i)$.

A unique solution is arrived at when in equation (2) $d > A$. If $d = A$, any solution A is greater than or equal to the maximum claim. The rule assigns the same sum to all creditors as long as this sum does not exceed each creditor's claims.

The third method, which is the constrained equal-losses rule divides the difference equally between the aggregate claim and the asset and ensures that no agent is negatively affected. An indirect approach was adopted by Maschler and Tijs (1988). The study applied the cooperative game theory as a means of discovering the allocation rules and analysing their properties. Such solution are usually required to be Pareto efficient, symmetric and invariant to strategic equivalence.

These traditional methods assume that the wealth of the creditor diminishes causes when a firm becomes bankrupt, not all creditors get to recover the whole debt. However, new approaches have

redefined the traditional problem statement by making it applicable to other bankruptcy issues (Bergantiños et al., 2010; and Calleja et al., 2005). The new generalized bankruptcy problem statement as opined in the research by Karpov and Yurkov (2012) integrates the system of inter-creditor debts which makes it a better model of the real world problem than the traditional method.

In summary, the bankruptcy problem is an entitlement distribution system involving the distribution of a given asset, which is inadequate to meet and satisfy all the creditors' demands. Indeed, claims recovery may not be, achieved by all creditors when a company becomes bankrupt because the assets are insufficient to satisfy all the demands. The consequences for the debtor are of course manifest. The theories underpinning bankruptcy is discussed in the next section.

3. BANKRUPTCY THEORIES

The recognition of the bankruptcy problem forms the basis for the various formal bankruptcy theories thereon. It is important however, to separate the causes of distress in the fortunes of a company. The insolvent state may be due to either economic distress and or financial distress.

The former happens when the company is unable to generate enough revenues to cover its costs, apart from the cost of financing operations. In which case, such an entity is, said to manifest a negative economic value.

Financial distress of a company is the situation where such an entity, without the burden of debt financing service would have reported positive earnings. Given that upon the crystallization of insolvency, the debt of a company becomes a sunk cost. This would render question of the continued existence of the entity irrelevant.

3.1. Maximisation of Social Welfare Theory

The theory of bankruptcy provides that social welfare be, maximized when economically distressed firms are, liquidated but financially distressed firms are continued. This is because creditors are more interested in the available of assets and the extent to which the assets can satisfy their claims than the prospect of saving the company. Creditors will attempt to seize all available and assessable assets which in the opinions of Ghosal and Miller (2003) may lead to a piecemeal liquidation. When an entity is undergoing only financial suffering, the maximisation of the creditors' total insolvency-state payoff can only be achieved were the firm continues in existence. The collective resolve and cooperation of all the creditors is a *sine qua non* requirement if the company is to be, saved. In fact, the creditors are required to to coordinate their collection efforts. It should be noted that the coordination costs may be sometimes high. Consequently, reasonable financial equilibria may exist where piecemeal liquidation of economically distraught entities are, conducted, without regulation (Ghosal and Miller, 2003).

Adler (2002) posits that a bankruptcy system can avoid these inefficient equilibria by delaying the collection efforts of the creditors until such a time when the government official decides on the future of the firm. Indeed, the liquidating government official should only auction insolvent firms that are free from current claims. Whatever proceeds obtained including surpluses (if any) should be, distributed to the claimants-creditors.

The position taken by Baird and Rasmussen (2003) is that the liquidator should decide on the option of either piecemeal or bulk disposal. The piecemeal liquidation is the more beneficial option where the economic value of the entity is, maximized where the disposal of individual assets yields greater value than wholesale disposal of the firm. In the alternative, if higher valued offer is, obtained for the firm as a going concern, then the entity could be so disposed of.

3.2. Absolute Priority Rule

The ex post value of a firm could be maximised with an appropriate provisions of an effective bankruptcy law which ensures equitable distribution of recovered value across all claimants. Such a law should give full respect to the claims priority among the different classes of creditors. The supposition of early theorists was that the absolute priority rule should be, strictly followed by a bankruptcy system. In effect, creditors to be, paid in line with the contractual terms or in the absence of documented contract, the settlement should be in the order with which contracts of the entity was, created (Aghion, 1998). Since the residual value of an insolvent entity is worth nothing, the equity shareholders would be the last to be paid. This can only happen where there is anything left after the higher placed priority claimants (government, creditors, preference shareholders, etc.) have been, fully settled. An exception to the provision as in Case v. Los Angeles Lumber Co. (1939) is when the equity holder has contributed money or money's worth to the reorganized enterprise.

There are exceptions that may justify the violation of the absolute priority rule. First, other distributional objective have become paramount. For example, where a court of competent jurisdiction may direct the abrogation of the absolute priority rule in the interest of fairness. The exception to this rule is however not applicable and cannot be invoked when the estate of a deceased is to be distributed. Jones Day Publication (2007) suggests that senior classes of creditors may prudently give up part of their rights in violation of the absolute priority rule in favour of lower class debtors in order to avoid disputes, which may result in prolonged bankruptcy case. Such protracted litigations may increase administration costs and drain the net available estate for sharing. The next discussion is on the creditors' bargain theory, which according to Baird and Bernstein (2006) appears to be the only rule that satisfies the absolute priority rule.

3.3. Creditors' Bargain Theory

This theory propounded by Jackson (1982) and later expanded upon by Jackson and Scott (1989) propounded the normative concept of what bankruptcy law is supposed to be, rather than offer explanation for the currently operative law of bankruptcy in practice. If both parties being rational and willing are able to negotiate and come into ex ante amicable agreement, they would be better positioned to strategically manage and reduce costs thereby maximizing the outcome.

In the absence of collaboration and sustainable concurrence among the creditors, each creditor would need to, vigorously pursue the strategic option of expedited individual collection of his entitlement ahead of the other creditors. This situation will create the classic example of "common pool puzzle."

The other course of action is the "race to the courthouse" or the race to individual collection. These non-accommodating approaches not only incur high costs but also incur administratively inefficiency. Rather than engage on solo actions, a central administration of the relationship and asset should yield more, efficient results.

The exact value of the available assets and resources of the debtor must be, known. This is under such common arrangements, matched within the context of the nature and extent of superiority and prioritised secured claims. It is however neither easy nor sometimes feasible given the dispersed (in number and time of lending) number of creditors. Indeed, Jackson (1982) argues that creditors face insurmountable transaction costs to actually sitting down and negotiating the entire capital structure of the debtor.

In addition, there are issues militating against the bargaining option arising from the fundamental expectations of the different classes of capital in a firm. When a company issues debt instruments, the settlement of that debt is dependent on the value of the firm in the future. The payment received by a secured creditor is, expected to be up to the face value of its debt (plus interest of course) in the future. The junior (unsecured) creditor however expects to receive the future value that exceeds that face value. In effect, the value of the interest of the junior creditor is the equivalent of a call option. The strike price equals the face value of the senior debt. However, Baird and Bernstein (2006) posit that in bankruptcy, the absolute priority rule destroys the value of that option because all future possibilities are, given present-day values thereby making negotiation in equitable.

The creditors' bargain theory has also been, criticized by Warren (1993) on the grounds, that its explanation and appraisal of the bankruptcy system is not only narrow but is also unrealistic. She contends that that economic value enhancement is only part of the goal of bankruptcy law.

In summary, the essence of the bankruptcy law is the realization of the assets of the debtor for onward distribution among competing creditors and claimholders. The bankruptcy system is, also utilized in managing the wide spectrum of the deleterious effects of business failure especially with the prospect of imminent failure of the defaulting persons or entity. Another bankruptcy management approach, which is an expanded model of the creditors' bargain, is the sharing of risk theory. This is the next presentation.

3.4. Risk-sharing Theory

In order to justify the normative redistribution provisions in bankruptcy law, Jackson and Scott (1989) proposed the modification of the creditors' bargain theory by postulating the risk-sharing theory.

One of the limitations assailing the creditors' bargain theory is the inadequate redistribution of wealth. The risk-sharing theory departs from the creditors' bargain theory in that it seeks to maximise general value of available assets and resources of the debtors. To achieve this objective, it seeks to compel all claimholders to partake in some part of the collective risk of the entity especially as relating to possible business failure. These risks are of two types as identified by Miles (2011). The sources of common risks are exogenously determined and are outside the control of the management. Such risks include economic-wide global downturn, industry specific problems or indeed government policies. The company –specific risks relate to both existential and lower level issues determined from endogenous sources. Such risk of loss may arise from managerial mischief and the managerial predilection for risk bearing.

The creditors can bargain for whichever of the risks. Those with the knowledge and/or capacity to monitor or control particular risks would seek preference for and individually bear such particular risks. The theoretical bargain with respect to the common risk is quite different because the control of common risks is not vested a particular constituted authority. Where all claimants are averse to bearing risks, will select the risk-sharing arrangement with respect to the common risks. This is because such an arrangement lessens the threat and provide each claimant a higher likelihood of suffering a loss of smaller magnitude.

The sharing of risk of bankruptcy is, complimented by the comprehensive manner in which bankruptcy system and stakeholders' interest are, handled in order for its participants to harvest optimum value. This is the focus of the next presentation.

3.5. Value-based Theory

The value-based theory was proposed by Korobkin (1991) explains the emergence of the bankruptcy law as a system with wide-ranging forms, proportions and magnitudes. The value-based theory does not consider the assets of the debtor merely as a pool of static or dead property, available only for sharing. The theory sees life and potentials for increase and loss in such resources. Just like a human debtor, resources available for distribution are, imbued with social, political and moral characteristics. They change with time and circumstances. Indeed, the theory compares such resources with the human life, which grows and diminishes at different rates throughout its life span. It is therefore difficult to proffer the same panacea for issues arising at different stages of the debtor's estate because every financial distress is unique in its historical context. Such issues have the capacity to grow and indeed mutate over its life-time. Korobkin (1991) argues that the bankruptcy law attempts to resolve the issues arising from the financial distress. The issues to be, addressed are multi-dimensional, encompassing social, political, economic and even moral extents. The resolution of the complexity of the problems emanating from financial distress is, better consigned to the diverse participants. These claimants represent the conflicting interests are, better positioned given their knowledge of the historical antecedents and dynamic mutation of the issues at stake. The handling of a bankruptcy matter should be comprehensive manner in order for its participants to harvest optimum value.

The bankruptcy-policy theory which highlights the limitations of the law and indeed, economics was proposed by Warren (1993). This is, discussed next.

3.6. Bankruptcy-policy Theory

The bankruptcy-policy theory provides for the alteration of the parties' non-bankruptcy right. This arises from the fact that wealth redistribution can arise in bankruptcy because bankruptcy and non-bankruptcy law deal with different kinds of defaults. Two prototypes of defaults are, postulated by the Warren (1993) theory. In the first, the single default where only one creditor complains about repayment and the remaining creditors are evidently (even if only temporarily) content with their repayment prospects. In the second type, widespread default occurs the prospects of repaying every creditor are, sharply diminished.

The non-bankruptcy and bankruptcy law deal with different situations and therefore adopt different distributive arrangements. Whereas the non-bankruptcy law provides a collection scheme that handles the first kind of limited default, the focus of the collapse of bankruptcy collection scheme is on the debtor's imminent default. Under the bankruptcy-policy theory therefore, appropriate protection are, provided to the different affected through its specific distribution rules.

The bankruptcy policy theory adopts the distributional scheme under non-bankruptcy law without inquiring into its appropriateness once the creditors' bargain theory is in operation. Warren however asserts that the bankruptcy policy should also takes into account the distributional impact of a business failure on parties who are not creditors. The category of stakeholders including staff members with no formal legal rights to the assets of the business should be, protected. Where feasible, a failing company an opportunity to sell itself as a going concern.

When the greatest claim is larger than or equal to the estate, Aumann (2010) recommends the use of the maximal game. However, when the greatest claim is smaller than the estate, the axioms of efficiency and satiation are difficult to satisfy simultaneously. Some of the claimants may receive more than their claim. This violates the satiation axiom. The minimal overlap rule lends itself to use in which the dictator may also play the unanimity game (Alcalde et al., 2010). de Mesnard (2015) however recommends the unanimity games which is akin to the creditors' bargain rule.

Jos´e-Manuel (2011) provides justification for use of the average of any pair of dual bankruptcy rules (which can be, understood as the proposal of an arbitrator or a mediator) through the definition a double recursive process. In the case of three or more possible sets of competing claims; the CEAs, the constrained equal losses rules and the constrained egalitarian rule and its dual rule are recommended. Moreover, whenever the average of these focal rules fulfills the properties on which the context is, based then the double recursive rule leads to an admissible allocation.

4. RELEVANCE OF BANKRUPTCY THEORIES IN BANKRUPTCY PREDICTION

Arising from the various theories of bankruptcy is the pragmatic need to be able to predict the outset of bankruptcy. Indeed, the prediction of bankruptcy has caught the fancy of several scholars. The use of accounting ratios in bankruptcy prediction has found prominent application starting from Beaver (1966) who applied the t-test to gauge the importance of individual accounting ratios within a similar pair-matched sample. In 1968, Altman deployed the multiple discriminant analysis in a pair set of samples and the Z-score financial analysis tool. A comparable analysis of the Altman Z-score accounting ratio-based ideal and a pre-set structural distance to default model was, conducted by Miller (2009). The result shows that the structural distance default model possessed more resilient bankruptcy signal but produces more unstable ratings than the Altman Z-score.

Other early set of predictive models included logit regression (Ohlson, 1980), probit (Jones and Hensher, 2004) multivariate discriminant analysis (Black and Scholes, 1973). Other models formulated to derive the factors associated with the probability of business default included neural networks, option pricing and contingent claims analysis. The genetic programming technique put forward by Lensberg et al. (2006) is set to minimizes the amount of pre-set structure associated with traditional functional forms. This model was, deployed in the review of 28 potential bankruptcy variables. The research reports provide support prior bankruptcy results that company size reduces bankruptcy risk when profits are positive. One of the factors determining the predictive ability of a model according to Bellovary et al. (2007) is the nature of the derivation of the data sample. The results obtained from the estimated sample tend to be greater than those from hold-out samples because the model is calculated based on such samples.

The predilection for complex modelling was, considered irrelevant by Pervan et al. (2011). Calculated simple financial ratios based on information obtained from published financial statements were however, found useful in effectively used for prediction of 78 bankrupt companies in Croatia. Similar financial ratio analysis in concert with the Bianco and Yohai (1996) estimator and maximum likelihood logistic regression was, deployed in comparing, classifying and predicting bankrupt firms by Hauser and Booth (2011) with robust predictive results.

Another rule-based model canvassed by Zhang et al. (2013) proposed a four-stage procedure which in essence consists of sequential forward selection of the most important features and fitting the dataset into meaningful categories. This study supports the findings of Jackson and Wood (2013) which evaluated 15 popular models from the literature. The conclusion drawn was that market data based models, which includes the stock market option valuation methodology, perform better than the earlier models, which rely heavily on historical accounting figures.

5. SUMMARY AND CONCLUSIONS

The bankruptcy problem as a distribution dilemma involves the apportionment of a given amount of inadequate resources belonging to an indebted entity among claimholders. Two of the world's major religions – Christianity and Islam recognise the possible inability by individuals to meet contracted obligations and prescribed panacea. The bankruptcy laws enacted modern states provided guidelines for addressing the bankruptcy problem and the rights of stakeholders (both debtors and non-debtors).

In exploring relevant theories guiding the procedure of distribution or entitlement in bankruptcy the study examined five theories. Maximization of social welfare theory advocates that piecemeal liquidation option should be adopted in maximizing economic value. The absolute priority rule advocates an appropriate distribution of the value across claimants on priority of claims basis. Creditors bargain theory and risk sharing theory anchors on the position of bargaining between the rational debtor and its debtor in adopting a mandatory and collective bankruptcy procedure.

Risk sharing theory further posit that bargaining arrangement to share the common risk lessens the risk and warrants to each claimant a lower probability of loss. The value based theory object to the above submissions and submit that the debtor should not be considered as a mere poll of assets and that there is no fixed answer or method to distribution and ranking of creditors in bankruptcy. The bankruptcy-policy theory provides for the alteration of the parties' non-bankruptcy right. Indeed, five of the theories examined has the principles guiding the procedure of distribution or entitlement in bankruptcy while one of the theories profound that there is no fixed answer or method to distribution in bankruptcy.

The knowledge of theories is not enough for business survival, the ability to predict the possible occurrence of business failures is necessary. Models based on market data including stock market option valuation approach perform better than the earlier models which rely heavily on historical accounting figures.

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