

Financial Distress, Prediction, and Strategies by Firms: A Systematic Review of Literature

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Abstract

The paper is systematic scrutiny of studies on financial distress, prediction, and strategies firms adapt to deal with the difficulty. To this end, the paper offers a dissection and assortment of 72 articles published between 2005 and 2017 in Scopus, Web of Science, and Science Direct. The authors chose the three databases as articles that are published only in indexed journals. The studies were selected based on the key terms "financial distress", "financial strategies", "financial distress prediction", and "financial distress strategies". The selected articles were evaluated based on seven categories: content, methodology, scope, and data analysis techniques, study period, study focus, and data analyzed. The evaluation and assortment of studies identified existing disparities in the literature on financial distress, offering opportunities for future researchers. Exceptional articles on financial challenges, prediction, and strategies adopted by firms were identified. The study finds that most of the studies centered on mature economies, whereas those on emerging markets-focused only on Asian markets. Equally, there are very few qualitative studies on the subject matter. Through the study, the authors paint a picture of existing literature on the subject matter; further, the authors expect the review to stimulate debate and further research among scholars.

Keywords

distress, prediction, strategies, financial

1 Introduction

Dynamic business or economic conditions are a continuous source of either opportunities or threats to business entities, whether large or small. For example, the Great Financial Depression of 2007/8 greatly affected most firms and contributed to an increase in studies on the subject. Many studies have since been carried out to develop and interrogate different models of predicting financial distress. Equally, economic uncertainties have resulted in firms developing strategies such as a complete exit from the industry, in extreme cases, to reorganizing operations. Financial trouble has a significant effect on an entity and stakeholders; managers should undertake substantial corrective action, which may be formal or informal (Couwenberg and de Jong, 2006). For instance, equity providers risk losing their investment, whereas management risk a cut in their incentives.

A prediction model with a high degree of accuracy is preferable for any firm. Sun and Li (2009) note that Financial Distress Prediction (FDP) is critical as it impacts a firm's going-concern and development for both the external investors and creditors' decision. Moreover, FDP assists stockholders to avoid severe capital loss whereas, for creditors, it augments a credit rating score exposing clients that are potential defaulters. Some researchers narrowed down to developing and analyzing models on the prediction of financial distress; (Chi and Tang, 2005; Cleofas-Sánchez et al., 2016; Zhou et al., 2012). Similarly, some studies evaluated the various strategies adopted by firms when in a financial distress dilemma; (Fan et al., 2013; John et al., 2013).

Few studies examine existing literature on the subject matter; however, they are entirely different from the present study. Sun et al. (2014) carried out a literature review

on financial distress and corporate failures; nonetheless, the study focused on definitions, modeling, sampling, and feature approaches. Senbet and Seward (1995) likewise performed a literature survey on the relationship between financial risk, bankruptcy, and reorganization. Despite the few reviews, many new empirical studies targeting varying aspects of enterprise distress are being published. Although the two highlighted reviews relate to the topic at hand, their focal point is entirely different from the current review. Based on the aforementioned, the aims of the study are:

- To identify the most relevant literature analyzing financial distress, its prediction and different strategic approaches by firms;
- To assort and codify characteristics of selected and reviewed studies;
- To give a summary of each paper and examine the dominant research on financial distress, prediction and different approaches used by firms
- To identify the most persuasive articles on the subject
- To provide a structure to address pertinent gaps in the present conversation on financial distress, its prediction, and approaches used by firms to mitigate against such situations.

Therefore, the purpose of this review is to pinpoint any existing gaps in the current literature on the subject. The authors analyze the research from the following three specific aspects: financial distress, its prediction, and various strategies adopted by firms to mitigate distress. The authors anticipate that the outcome of the study will provide useful insights into the field for industry players, policymakers, and academicians.

In subsequent sections, the researchers present the research methodology; the assorting and coding mechanism adopted in the study; a concise analysis of the concept of financial distress, its prediction and relevant strategies (Section 2); the profiles and outcomes of reviewed literature (Section 3), the conclusion, proposed research agenda, and final considerations (Section 4).

2 Research methodology

The article follows the methodology employed by Silva et al. (2017) and Nejad (2016). The paper develops a systematic literature analysis methodology in reviewing articles on financial distress, prediction, and strategies by firms. The method is necessary for structuring the research findings that address rising themes and

offers a comprehensive evaluation of existing literature (Silva et al., 2017). This approach is useful since it characterizes the research field pointing out grey areas or gaps in the existing literature, thus providing a basis for future studies. Some researchers or authors have used such a review method with success (such as Senbet and Seward, 1995; Tchankam et al., 2016). Lage Junior and Godinho Filho (2010) developed research steps in their review study as shown below and which this paper borrows;

- Step 1: Perform a comprehensive literature search on the subject matter;
- Step 2: Develop a detailed assortment structure;
- Step 3: Apply the assortment structure and elaborate structure of the present conversation on the subject matter
- Step 4: Present the characteristics of the reviewed literature, the main results, and the coding system as per the structure
- Step 5: Analyze the gaps and suggestions for future research opportunities.

In fulfilling the study objectives, the authors premise the study on the systematic analysis of different journals, all directly relating to financial distress, prediction, and strategies by firms. The first step in developing the scientific map on the subject was to collect an acceptable sample of articles from peer-reviewed journals. The analysis of various materials was conducted between February and March 2018. The inspection was performed using keywords in the article title and abstract. The words used in the research were "financial distress", "financial strategies", "financial distress prediction", and "financial distress strategies". The three primary databases used to retrieve journals were: Web of Science, Scopus, and Science Direct. Other combinations of the keywords were also utilized to improve the chances of success. Ngai et al. (2008) used journals as they are resources most frequently used in gaining knowledge and new scientific discoveries—based on the same, this article excludes conference proceedings, Master or Doctoral theses, books, and unpublished studies.

Moreover, omitted are articles not in English, those unavailable for full download, and those outside the 2005–2017 review period. In the end, the authors accepted 72 publications for the final analysis after removing duplicates and ambiguous literature. The distribution of the papers was as follows: 7 for Web of Science, 5 for Scopus, and 60 for Science Direct, as shown in Fig. 1. The search for relevant

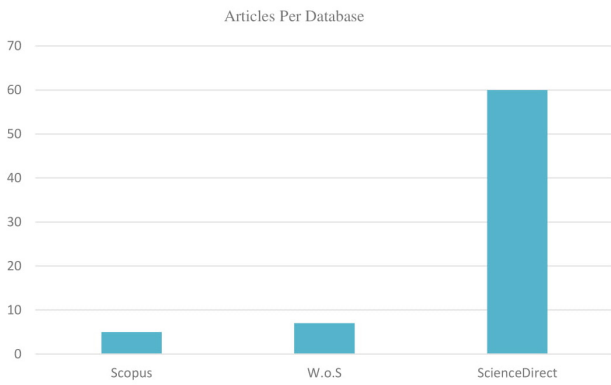


Fig. 1 Articles reviewed per database

literature may not have been exhaustive; this study gives an extensive base for the comprehension of "financial distress, prediction, and strategies by firms" research. Each retrieved article was carefully reviewed before deciding its inclusion in the study. The papers analyzed are more than those considered in previous studies of Chiappetta Jabbour (2013) and Lage Junior and Godinho Filho (2010).

Selected articles were then categorized based on the publication year, as shown in Fig. 2. Period 2005 and 2010 had the least number of publications. Generally, the number of papers kept fluctuating over the years; this may be due to varying economic dynamics in different geographical areas promoting others to undertake such studies.

The study develops an assortment and coding system for selected articles discussed in Subsection 2.1.

2.1 Assortment and coding

Once reviewing the literature was completed, the construction of the assorting method followed, as shown below.

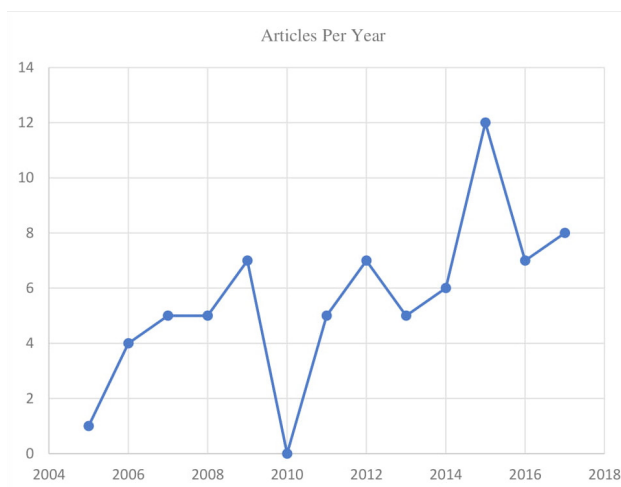


Fig. 2 Reviewed articles published per year

The assortment follows similar works by Silva et al. (2017), Chiappetta Jabbour (2013), and Lage Junior and Godinho Filho (2010). The assortment structure comprises of 7 categories coded with alphabetical letters (such as A, B, C). The assortment and coding used are illustrated in detail in Table 1. The "Country" section, denotes the country that was the focal point for the selected article. Studies focusing on two, more or no states at all, were left unfilled.

- Assortment One: *Context*, coded A, B, and C
- Assortment Two: *Study Method*, coded A to E
- Assortment Three: *Scope*, coded A to E
- Assortment Four: *Data Analysis Technique*, coded A to D
- Assortment Five: *Study period*, coded A to D
- Assortment Six: *Focus*, coded A to H
- Assortment Seven: *Data Analyzed*, coded A to E

Table 1 The structure for assortment and coding reviewed studies

	Context	Encryption
1	Background	A-Developed countries B-Developing countries C-Mixture of A and B
2	Study Method	A-Quantitative B-Qualitative C-Mixture of A and B D-Theoretical/Conceptual E-Survey/Case-study
3	Scope (Country)	A-One economy B-More than one economy C-Trade block/Regional D-Global E-Unspecified
4	Data Analysis Technique	A-Mathematical modelling B-Simulation/Computational C-Statistical/Multivariate/ Econometrics D-Not applicable
5	Study Period (years)	A-Less than two years B-Between 2 and 5 years C-Between 5 and 10 years D-Over 10 years E-Unspecified
6	Focus	A-Financial distress prediction B-Mitigation strategies C-Financial institutions D-Non-financial institutions E-Regulation F-Stock Market G H- Other related aspects - Two or more aspects
7	Data Analyzed	A-From securities market/regulators B-From Databases C-From industry/firm D-From mixed sources E-Not applicable

2.2 A brief conceptual foundation of financial distress, prediction, and strategy

2.2.1 Definition of financial distress, prediction, and strategy

Financially distressed firms are defined in several ways. These are entities with diminished market value due to low achievements, are ineffective producers with substantial financial leverage and liquidity problems (Chan and Chen, 1991). Wruck (1990:p.421) describes financial distress as "a situation where cash flow is insufficient to cover current obligations. These obligations can include unpaid debts to suppliers and employees, actual or potential damages from litigation, and missed principal or interest payments under borrowing agreements (default)". Blazy et al. (2014) detail financial distress as a situation whereby a firm is unable to finance present obligations as they arise; equally, based on the Basel II principle, a business is in "default" if planned payments are deferred for more than 90 days. Purnanandam (2008) defines financial distress as a depressed cash-flow situation whereby a firm incurs losses but remains insolvent.

Hsieh et al. (2012) illustrate how the 2008 global financial turmoil had serious economic outcomes in many countries; the capability to forecast financial failings and their trends is crucial. Financial distress prediction is critical for any entity. For example, in the banking industry, insolvency prediction and credit tallying are two essential criteria for financial distress prediction with different statistical prediction models being developed (Liang et al., 2015). Various financial prediction models exist and continue to be developed, as will be illustrated elsewhere in this article. Chen and Du (2009) demonstrate how a business might manipulate liquidity ratios to conceal its liquidity deficiency that would otherwise be detected as financial distress in the short-term.

There are various strategies for resolving financial distress by firms. They range from agreements to reach unofficial out-of-court restructuring of the entity's capital arrangement to an official insolvency procedure in which a business can seek either liquidation or reorganization under the protection of a bankruptcy court. Distressed firms should opt for informal restructuring as it is inexpensive when compared to an official bankruptcy strategy (Jensen, 1991). John et al. (2013) argue that firms should only reorganize after a cost-benefit analysis of liquidating assets and restructuring privately against the gains of filing for Chapter 11 and offering new equity instruments.

2.2.2 An overview of financial distress, prediction techniques and remedial strategies by firms

Hofer et al. (2009) present how a firm's financial distress can lead to and result from price competition: low market prices may push firms into financial distress and bankruptcy, the latter may, in turn, affect a firm's competitive pricing behavior. The costs associated with financial trouble can arise from various sources. Bhattacharjee and Han (2014) studied the effect of micro and the macroeconomy factors on financially distressed for listed Chinese firms between 1995 and 2006, a period of massive economic transition. The study finds firm business attributes, macroeconomic volatility, and institutional considerations as having an impact on the perilous degree of financial distress. Lian (2017) shows that a supplier's chance of financial difficulty is positively correlated to its primary customer's liquidity situation. John et al. (2013) distinguish between explicit and implicit costs of financial trouble; inherent costs refer to unplanned expenses met due to default such as expenditure on juridical, bookkeeping, and banking (investment) services whereas inherent costs of are all expenses associated with the business's bankruptcy or debt restructuring. One such cost, as Froot et al. (1993) reveal, is that a financially distressed firm with limited hedging options or debt may have to forfeit profitable projects due to costly external financing.

Secondly, financial distress is expensive where a firm's unstable position results in an aggressive action by competitors in snatching the chance to increase market share. Moreover, deeply financed firms tend to surrender considerable market share to more conservatively leveraged rivals in an industry downturn (Opler and Titman, 1994). Additionally, a financially distressed firm has a higher probability of negating on debt agreements or default principal payments without necessarily being bankrupt (Purnanandam, 2008). Richardson et al. (2015b) found financial distress and tax circumvention to have been amplified during the 2008 global financial crisis. López Gutiérrez et al. (2009) note how the type of bankruptcy law determines the valuation of a firm's stocks, equally, a fall in share price is higher in creditor-oriented systems whereas unfavorable returns are lesser in debtor-oriented arrangements. Boubaker et al. (2018) analyzed financial distress (as a systemic risk) and its effect on equity returns and state that; the risk premium for the relative aspect factor is crucial only for the shaky business portfolio(s).

Hsieh et al. (2012) indicate that the capability to produce competent forecasts about financial distress continues to be a significant problem in corporate monetary administration. Cases of economic calamities leading to corporate bankruptcies both in domestic and international stock markets give credence to this fact. Lin et al. (2014) find bankruptcy prediction and credit scoring to be two crucial aspects in the prediction of financial distress for financial institutions with various statistical and machine learning techniques utilized to develop economic prediction models. Chen and Du (2009) find the Artificial Neural Network approach as giving superior prediction certainty as compared to Data Mining clustering techniques. Cao (2012) experimental results show how the addition of an entity's life cycle and Choquet integral in financial distress prediction incredibly improved accuracy of prediction results. Huang et al. (2012) find Support Vector Machines to perform well in pattern recognition but wanting in the utilization of defined training data and interpreted testing data. Besides, Bae (2012) developed a radial model whose experimental results on the Korean manufacturing sector show it has a high degree of accuracy in the prediction of financial distress. Some models combine different approaches, for example, combined cluster techniques with classifier ensembles to forecast economic instability. On application, Geng et al. (2015) used data mining to predict the financial distress of firms in Chinese.

Firms adopt different strategies to mitigate the effects of financial distress. Nigam and Boughanmi (2017) demonstrate how some economies enhanced bankruptcy listing by empowering creditors, accelerating legal procedures, advocating for an out-of-court settlement, and controlling of insolvency professionals. Kam et al. (2008) state that businesses primarily endure distress by slowing down on capital investments; however, the degree is lower in state-owned firms due to lesser budget restraints and slowing on employment. Restructuring strategies encompass mergers and acquisitions, selling off assets, debt-rescheduling, and management changes. On the contrary, Meier and Servaes (2014) suggest that firms acquiring insolvent entities or their investments earn excess returns of at least 1.6 % points greater than in routine acquisitions. Acharya et al. (2007) detail how defaulting, businesses in distressed sectors have a tendency to reemerge as reorganized entities than being disposed of, liquidated, or engage in lengthy bankruptcy suits.

Furthermore, Campa and Camacho-Miñano (2015) illustrate how firms with greater levels of financial instability exhibit more tendencies of higher earnings management through legitimate transaction manipulation as compared to accruals and vice versa (Ghazali et al., 2015). Blazy et al. (2014) investigated the settlement of financial distress by French firms in default, narrowing on their decisions between insolvency and out-of-court agreements. Empirical studies reveal the disposal of assets whether fixed or intangible and investments in other companies as commonly used by financially distressed firms (Kahl, 2001). Their findings show that, in most situations, acquisitions do not effectively reorganize a distressed target firm. Debt restructuring is a scenario where a firm changes debt levels by either lowering or raising leverage; the approach has positive disciplinary outcomes (Wruck, 1990).

However, other researchers do hold a contrary opinion. Li et al. (2017) find financial distress as creating an incentive for firms to diversify and shifts investment from internal capital expenditure to expansionary acquisitions. The managerial restructuring that encompasses new appointments or independent and involuntary resignation of top management is another strategy whose empirical findings are contradictory. Early empirical studies found excess returns to shareholders on announcements about the exit of senior management of a financially distressed firm (Bonnier and Bruner, 1989); besides, the stock reaction is adverse if management exit is by force (Warner et al., 1988). On the contrary, Dherment-Ferere and Renneboog (2000) found a 0.5 % positive and significant return attributable to the involuntary exit of top management but no price change on voluntary resignations. The probability of bankruptcy and insolvency contracts with increases in liquidity levels; however, capital adequacy ratios are essential only for large banks (Chiaromonte and Casu, 2017). Chi and Tang (2007) find reorganization announcements to have a favorable effect on the distressed firm stocks.

3 Results

Section 3 presents the findings of the reviewed literature and Table 2 shows brief descriptions of some selected studies.

4 Discussion

Table 3 gives a codification breakdown of all reviewed studies in this article.

Table 2 Brief descriptions of some selected studies

Study	Summary
Acharya et al. (2007)	The authors highlight the impact of industry-wide distress on creditor restoration in the U.S for the period 1982–1999; findings; industry situation at the time of default is a powerful and economically significant determinant of creditor restoration.
Annabi et al. (2012)	The authors demonstrate a contingent claims technique for a financially distressed firm with a formal account for renegotiations based on bankruptcy practice in the U.S (Chapter 11).
Airaudo et al. (2013)	The study finds financial turbulence defined by banking distress as usually linked to deep-seated and lengthy downturns than stress associated with securities or external exchange markets.
Bae (2012)	The study develops a model aimed at improving the reliability of financial distress forecasting using financial data of 1888 manufacturing corporations collected from the Korea Credit Guarantee Fund for the 1999–2005 period.
Blazy et al. (2014)	The authors investigate settlement of financial distress for small to medium-sized French enterprises in default. The study finds some banks are better than others at championing fruitful renegotiation process.
Charitou et al. (2007)	The study examines the earnings management behavior of U.S. firms that filed for bankruptcy. There is downwards earnings management one year before the bankruptcy filing.
Chen and Du (2009)	The study illustrates artificial intelligent technique as more appropriate than traditional statistics in the prediction of potential financial distress in an enterprise.
Chi (2009)	The study analyses ramifications of a loanee's reorganization filing on its preferred and second lending bank by evaluating 96 reorganizations registered in Taiwan for the 1995–2006 period. Results show that small banks tend to have lower equity fluctuations than dominant ones.
Chiaromonte and Casu (2017)	The study supports Basel III's guidance on structural liquidity advocating for heightened regulatory emphasis on significant and systemically crucial banks.
Cleofas-Sánchez et al. (2016)	The study presents an alternative technique based on neural network, known as hybrid associative memory with translation for financial distress prediction.
Colvin et al. (2015)	The study reveals why some banks face financial crises whereas others endure and find high-risk banks (highly debt-financed portfolios and vast quantities of deposits) as more likely to flounder.
Couwenberg and de Jong (2006)	The study finds banks to be critical in the restructuring actions of firms. The study focused on small and medium enterprises in the Netherlands.
Demirgüç-Kunt et al. (2006)	The study analyses the banking crisis in 35 countries for the period 1991–2000. There is no correlation between bank crises and a significant decrease in total bank deposits relative to the gross domestic product.
Elkamhi et al. (2012)	The study specifies that where firms absorb even moderate financial distress expense before insolvency, the aggregate present value of such costs wipes away the tax benefit.
Fan et al. (2013)	The study investigates how institutional factors influence the behavior of distressed enterprises in emerging markets. The quality of local government and corporate ownership structure are important determinants of a firm's performance during distress.
Geng et al. (2015)	The study proves why the outcome of neural networks is reliable compared to other classifiers such as probability trees and Support Vector Machines, or ensemble of multiple classifiers combined using majority voting.
Ghazali et al. (2015)	The study finds that the management of entities employ earnings management if the firm is financially sound and profitability high.
Hausch and Ramachandran (2009)	The study demonstrates how in equilibrium combined debts of the business are minimized more offering positive expected residual earnings to the owner-managers, improving inducements to efficiently manage the entity and can lead to a pay-off that is Pareto superior to other bankruptcy approaches.
Hertzel et al. (2008)	It links financial turbulence of bankruptcy procedures to adverse and significant stock price effects for suppliers.
Höwer (2016)	The study particularised the impact of both bank attributes and relationships in scenarios where entities are financially distressed summarising that a significant percentage of non-performing customers offer undesirable incentives.
Hsieh et al. (2012)	The study examines the forecasting power of Support Vector Machines (SVM) method that utilizes the features of a penalty operation to develop financial distress predictions accurately.
Hu (2008)	The study details a unique multiple layer perceptron based on a non-additive decision-making technic, applying the method to the analysis of financial distress.

Study	Summary
John et al. (2013)	The study suggests two mechanisms at a firm's disposal in dealing with financial difficulties: one, recapitalization process, two liquidations depending on a cost-benefit analysis. This study illustrates the reorganization approach of a distressed entity and generates many testable predictions, some innovative while others explain previously documented empirical results.
Kam et al. (2008)	The study states that government ownership has a detrimental outcome on the distress-settlement process by disrupting resource allocation, management inducements and investment arrangements in a liberalized and competitive economy.
Ko and Lin (2006)	The study offers an evolutionary avenue with modularized evaluation operations to predict financial distress by using data of 537 firms obtained from Taiwan Exchange database for the period 1993–2003.
Koetter et al. (2007)	The study examines approximately 1000 mergers in Germany for the period 1995–2001. Results; progressing financial conditions lessen the chances of distressed mergers as compared to non-distressed mergers.
Koh et al. (2015)	The study evaluates strategies chosen by firms when facing financial distress and concludes that declining investment and dividends are linked to the recovery for firms, albeit with little influence on the lifecycle.
Lee (2017)	The author interrogates financial distress in the United States restaurant sector for the period 1990–2008—finds a positive modifying effect of capital magnitude on the relation between leverage and financial distress.
Li et al. (2017)	The study presents origins of the distress puzzle, connecting the negative link between financial distress and equity returns. Distressed entities overinvest, waste value, and drain their cash-flow.
Lian (2017)	The author analyses aspects of customer-supplier interactions on suppliers' financial distress. The author finds a supplier's chances of difficulty to be positively associated with its primary customer's financial distress situation.
Chen (2011)	The study furthers predictability power of financial distress forecasting model, suggesting that an artificial intelligent (A.I.) approach is a more reliable method than traditional approaches.
Migliani et al. (2015)	The study finds causal proof that voluntary acceptance of corporate governance structures results in low levels of financial distress.
Nigam and Boughanmi (2017)	The study points out that many countries enhanced bankruptcy positioning by entrusting creditors, accelerating legal procedures, advocating for out-of-court processes, and monitoring insolvency professionals.
Oliveira et al. (2017)	The study examines how the financial distress of a significant client affects the capital arrangement of suppliers—findings; suppliers improve on leverage in two years preceding the filing date, and lower leverage after the client restructure its liabilities and capital structure based on Chapter 11 procedures.
Opler and Titman (1994)	The authors study corporate risk-administration in light of financial distress expenses. Concludes the existence of a non-monotonic association between leverage and hedging; the impact of leverage on hedging is more significant for entities in deeply concentrated industries.
Pindado et al. (2008)	The study develops a specified model to measure Financial Distress Likelihood (FDL) potent to time and the international background than the measures of FDL grounded on fundamental techniques.
Pryshchepa et al. (2013)	The study considers the power of investors to limit the behavior of management in distressed enterprises—findings; distressed entities pursue aggressive accounting codes and overtimes engage in earnings misstatements.
Richardson et al. (2015b)	The study explores the effect of financial distress on avoidance of tax and finds difficulty to have a significant and positive association with tax avoidance across many proxy measures.
Tamayo (2017)	The study suggests that poorly schemed bankruptcy arrangements can escalate the proportion of firms associated with financial restraints, with substantial negative ramifications for cumulative output and TFP
Tsai (2014)	The study develops an innovative hybrid financial distress technique positioned on blending the clustering approach and classifier ensembles. Advocates for a combination of Self-Organizing Maps (SOMs) with MLP classifier ensembles as it works well, offering greater forecast accuracy and lower Type I & II errors.
Tykiová and Borell (2012)	The study finds private equity investors to choose firms with minimal financial distress than similar non-buyout firms where the distress risk grows after the buyout. The sample was from in the 15 European Union nations.
Willis et al. (2018)	The study suggests that at moderate levels, entities with higher outcomes of financial distress exhibit more predominant signs of improved earnings management through manipulation of genuine transactions as compared to accruals and contrariwise.
Zhou et al. (2015)	The authors explore the effectiveness of various financial distress prediction techniques with features option avenues established on domain knowledge or data mining approaches using data on 287 companies from the Chinese securities market for the 2006–2011 period.

Table 3 Assortment and coding of the reviewed studies

Study	Country	Context	Method	Scope	Technique	Period	Focus	Data
Acharya et al. (2007)	United States	A	A	A	C	D	B	B
Annabi et al. (2012)	United States	A	A	A	A	D	A	B
Avramov et al. (2013)	United States	A	A	A	C	D	F	C
Al-Salem et al. (2009)	Korea	B	D	A	A	C	A	C
Besancenot and Vranceanu (2009)		C	C	E	A	E	F	E
Bhattacharjee and Han (2014)	China	B	A	A	A-C	D	D	B
Blazy et al. (2014)	France	A	A	A	C	D	B	C
Boubaker et al. (2018)	France	A	A	A	C	D	F	D
Bruynseels and Willekens (2012)	United States	A	A	A	C	D	B	B
Campa and Camacho-Miñano (2015)	Spain	A	A	A	C	A	B	B
Cao (2012)	China	B	D	A	A-C	C	A	A
Cardarelli et al. (2011)		A	B	B	D	D	C	D
Charitou et al. (2007)	United States	A	A	A	C	D	B	B
Chi and Tang (2005)	Taiwan	B	E	A	C	D	F	D
Chi and Tang (2007)	Taiwan	B	A	A	C	D	E	D
Chi (2009)	Taiwan	A	A	A	C	D	C	D
Chiaromonte and Casu (2017)		A	A	C	C	D	E	C
Cleofas-Sánchez et al. (2016)		C	D	B	A	E	A	B
Colvin et al. (2015)	Netherlands	A	A	A	A	D	C	D
Constantin et al. (2018)		A	E	C	A-C	C	C	E
Couwenberg and de Jong (2006)	Netherlands	A	C	A	C	D	B	C
Demirgüç-Kunt et al. (2006)		C	C	D	C	D	C	D
Fan et al. (2013)	China	B	C	A	C	D	B	A
Fisher et al. (2016)		C	A	A	A	E	B	E
Geng et al. (2015)	China	B	A	A	A-C	C	A	A
Ghazali et al. (2015)	Malaysia	B	C	A	C	D	B	A
Hausch and Ramachandran (2009)		C	E	E	A	E	B	E
Hertzel et al. (2008)	United States	A	C	A	C	D	F	B
Höwer (2016)	German	A	A	A	C	D	C	B
Hsieh et al. (2012)	Taiwan	B	E	A	A-C	C	A	D
Hu (2008)	United States	A	A	A	A-C	D	A	B
Huang et al. (2012)	Taiwan	B	A	A	A-C	C	A	A
Iqbal and French (2007)	United States	A	A	A	C	C	H	B
John et al. (2013)		C	A	E	A	E	B	E
Kam et al. (2008)	China	B	C	A	C	E	B	B
Kapadia (2011)	United States	A	A	D	C	D	F	D
Ko and Lin (2006)	Taiwan	B	D	A	A-B	D	A	D
Koetter et al. (2007)	German	A	A	D	C	D	E-F	C
Koh et al. (2015)	United States	A	A	A	C	D	B	B

Study	Country	Context	Method	Scope	Technique	Period	Focus	Data
Lee (2017)	United States	A	A	A	C	D	A	B
Li et al. (2017)	United States	A	A	A	C	D	E	B
Lian (2017)	United States	A	A	A	C	D	H	D
Liang et al. (2015)		C	D	C	A-C	E	A	D
Lin et al. (2014)	Taiwan	B	D	A	A	C	A	E
Lohe and Calabrò (2017)	Norway	A	E	A	C	A	H	D
López Gutiérrez et al. (2009)		A	C	D	C	D	E	D
Chen (2011)	Taiwan	B	D	B	A-C	C	A	D
Manzaneque et al. (2016a)	Spain	A	C	A	C	C	D	C
Manzaneque et al. (2016b)	Spain	A	C	B	C	C	D	D
Migliani et al. (2015)	Australia	A	A	A	C	C	B	B
Miller et al. (2015)	United States	A	A	A	C	C	C	D
Moreno-Bromberg and Vo (2017)		C	A	E	A	E	B	E
Nigam and Boughanmi (2017)		C	B	D	D	D	B	E
Oliveira et al. (2017)	United States	A	A	A	C	D	H	D
Pindado et al. (2008)		A	A	B-C	A	C	A	D
Pryshchepa et al. (2013)	United States	A	E	A	C	D	B	B
Purnanandam (2008)		C	C	E	A-B	E	F	B
Richardson et al. (2015a)	United States	A	A	A	B	B	B	B
Richardson et al. (2015b)	Australia	A	A	A	C	B	B	C
Piñeiro Sánchez et al. (2013)	Spain	A	A	A	C	D	D	C
Sheaffer et al. (2011)	Israel	C	A	A	C	C	B	C
Sun and Li (2009)	China	B	D	A	A	C	A	D
Sun et al. (2011)	China	B	D	A	A	D	A	A
Tamayo (2017)		C	A	E	A	E	B	E
Tsai (2014)		C	D	E	A	E	A	E
Tykvová and Borell (2012)		A	A	C	A	C	B-F	B
Chen and Du (2009)	Taiwan	B	D	A	A	C	A	A
Zhang (2017)	United States	A	A	A	C	B	B	D
Zhang (2015)	United States	A	A	A	A	D	B	D
Zhou et al. (2012)		C	A	C	A-C	C	A	D
Zhou et al. (2015)	China	B	D	A	A-C	C	A	A

4.1 National context

The item is summed up in Fig. 3. The item was grouped into three categories: *developed country-* "A", *developing country-* "B" and *mixed or general-* "C". Category "C" was used for articles that were not region/country-specific and or was a mix of both "A and B". Over 50 percent of the papers focused on developed economies—this may be linked to advances in these economies,

financial systems as well as a large pool of qualified financial researchers. However, one interesting fact is that some articles on developed economies were authored by researchers from developing nations mostly from Asia. Equally important is that studies on developing economies focused mainly on Asian countries with not even a single notable study on the African continent. The least researched aspect was on the mixed economies.

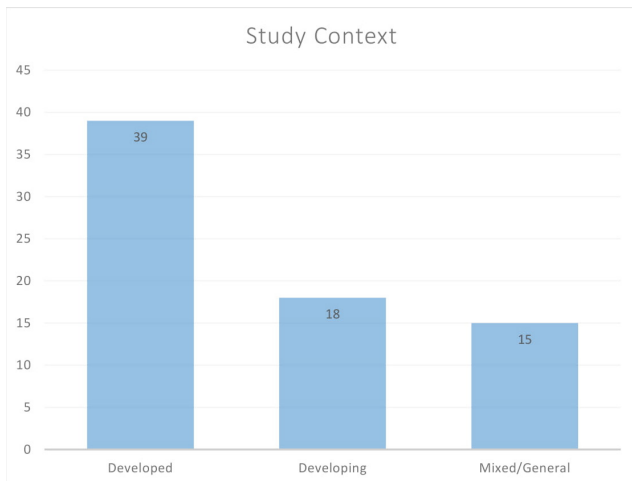


Fig. 3 Distribution of context

4.2 Study method

The second item was the methodology of reviewed articles; the item was classified, as shown in Fig. 4. Analysis of the results demonstrates that most studies on financial distress, prediction, and adopted strategies were quantitative ($N = 41$), a combination of both quantitative and qualitative ($N = 12$); theoretical/conceptual ($N = 11$). Surveyor case studies were minimal ($N = 6$), whereas purely qualitative studies had the least number of reviewed literature ($N = 2$).

4.3 Scope

Fig. 5 summarizes the item coded from "A" through to "E". Where; A- one country, B- more than one state, C-trading block/region, D-global, and E- unspecified. Fig. 5 shows that most of the articles focused on one specific country with those on unspecified countries being a distant second. There was no significant difference in studies focusing on more than one country, trading block/region, and an international perspective. Nevertheless, few studies centered on both cross-border and economic blocks.

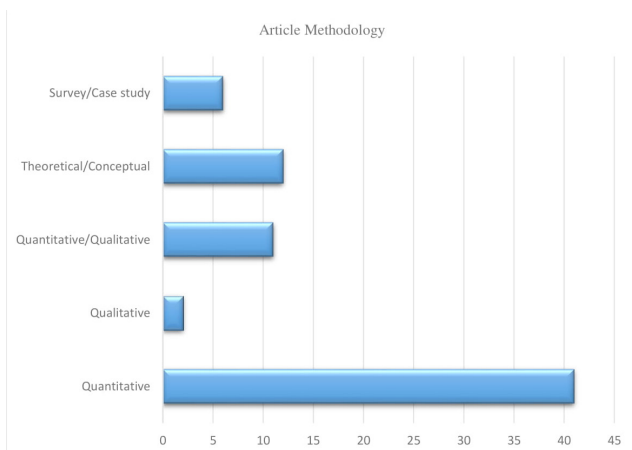


Fig. 4 Frequency distribution for methodology

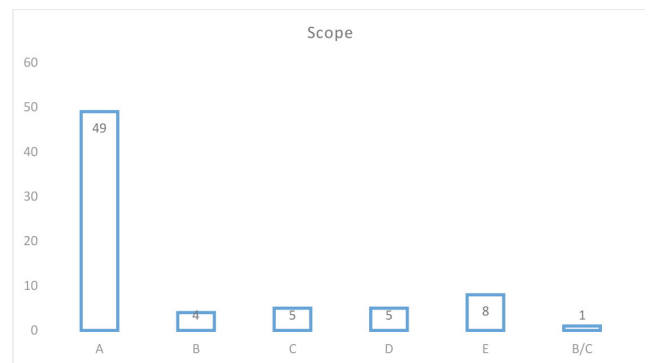


Fig. 5 Frequency distribution for scope

4.4 Data analysis technique

Table 4 summarizes the item. Predominance was given to statistical, multivariate, and econometrical analysis approaches ($N = 48$). Mathematical modeling techniques were a distant second ($N = 19$) whereas, simulation or computational approach ($N = 3$) received the least attention from authors. Studies with no data analysis were ($N = 2$).

4.5 Period of study

Fig. 6 summarizes the item coded as follows; A- under two years, B- between 2 and five years, C- between 5 and 10 years, D- 10 years and above whereas E- unspecified. Most of the studies, as demonstrated by the graph, were for a period higher than ten years; this is because of the sufficiency in time to track the effect of financial distress and the effectiveness of mitigating strategies adopted by firms. Equally, articles covering a range of 5 years to

Table 4 Assortment according to the data analysis technique

Method used	Number of articles
Mathematical modeling	19
Simulation/Computational	3
Statistical/Multivariate/Econometrical	48
Not applicable	2

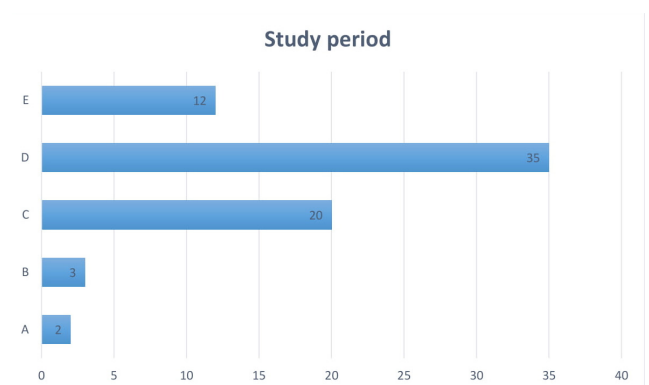


Fig. 6 The spread of articles according to the period

10 years and those unspecific on duration were considerable. However, studies on short-term spans of less than five were somewhat minimal.

4.6 Focus of the study

The item is summarized in Fig. 7 coded as follows; *A*- financial distress prediction, *B*- mitigation strategies, *C*- financial institutions, *D*- non-financial institutions, *E*- regulation, *F*- stock market, *G*- two or more aspects, *H*- other related aspects. Most of the studies focused on strategies to mitigate financial distress ($N = 24$). Secondly, were articles concentrate entirely on the prediction of financial difficulty ($N = 19$); studies in the category are divided into those that endeavored to develop, build on existing or test the reliability of available models. The high number of articles in the two groups is due to continuous improvements to better the accuracy of prediction techniques. Financial institutions and stock markets had the same number of reviewed articles ($N = 7$). Most of the papers on financial institutions focused on banking entities due to the importance of the financial industry in any given economy.

Besides, in equity markets, the stability of any securities market is crucial in instilling investor confidence. Further, there was no much difference in the number of articles on non-financial institutions, regulations, and other related aspects. Non-financial institutions such as in the service and manufacturing sector are crucial but prone to cyclical changes in the regional and global business environment; this could be an explanation for the number of studies. Regulation is critical for both financial and non-financial industries, given cases of corporate failures attributed to weak laws. The least researched aspects are on two or more areas relating to the subject matter.

4.7 Data analyzed

The item is summarized in Table 5—which illustrates that most of the studies relied on data obtained from mixed sources and various databases. The complexity, varying,

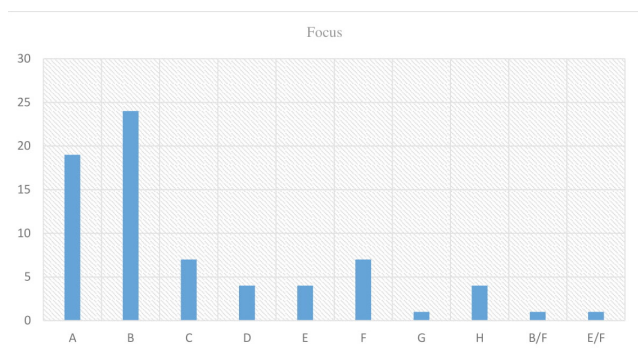


Fig. 7 Frequency distribution for focus

Table 5 Assortment according to data analyzed

Data type	Number of articles
Stock markets/Regulators	8
Databases	21
Industry/Firm	11
Mixed sources	22
Not applicable	11

and voluminous nature of the data required may explain why the use of diverse sources. Equally, a significant number of articles analyzed data obtained from industry or firm-specific sources. Studies relying on data from the stock market or regulators were few, probably due to bureaucracies associated with such institutions. Equally, some studies relied on data generated by computers/models or used no data at all, as shown under the "Not Applicable".

5 Conclusion and future research proposals

Findings on nation and context give a worrisome perspective; for example, most of the studies focus on developed economies, and those on emerging economies are mostly from Asia. Interestingly, some authors focusing on developed economies are descendants of developing nations. Most notable is the fact that not a single study focused on the African continent or the Middle East, a pointer to how the researchers have neglected some regions. Given the interconnectedness of the global economy, firms in these geographical areas face financial challenges equally; therefore, it could be an opportunity for future researchers. Moreover, there are multinationals with operations in the neglected but emerging economies. On research methodology, few studies were qualitative, case studies, or surveys. There are too many quantitative studies, whereas qualitative ones, necessary for explaining various phenomena or build on existing theoretical literature are the missing link. The question then is, why are we having fewer qualitative articles on the subject? Besides, the focus was predominately on a "single country" with few studies analyzing the issue from a global or economic block perspective.

Moreover, on methodology, few articles used simulation and or computational approaches. Similarly, combinations of methods such as mathematical modeling used along with statistical, econometrics, or multivariate analysis were few. Thus, most researchers preferred using tried and tested methods in their researches. Moreover, most researchers chose the long-term period for their studies with few studies on short-term periods. Short term articles could offer exciting findings on how firms respond immediately to financial distress. Finally, few publications

focused on the securities market, an essential institution in any given economy. Therefore, the gaps highlighted offer opportunities for future researchers.

On limitations, the authors appreciate those that arise from the methodology used. For example, the criterion for article selection was subjective and could have resulted in some articles being included, and others excluded from the sample. However, the study endeavored to strike a balance as much as possible. Additionally, the sample size may not be exhaustive as articles from other databases were not included. Besides, the assortment can be

modified based on the author's approach. Also, the review period, which is twelve years, may not be sufficient enough. Nevertheless, of importance is that the findings mirror the current literature and can be a point of reference for authors and policymakers keen on financial distress, prediction, and mitigation strategies.

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