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Establishing turnaround potential before commencement of formal turnaround proceedings

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Background: Determining the turnaround potential of a firm has plagued academia and practice. Existing failure prediction tools yield limited insight into turnaround potential and are heavily dependent on financial metrics. This framework made a valuable contribution to research in this field as it added a new perspective for decision-making purposes.

Aim: Practitioners, judges or directors require a quick, efficient framework to aid in developing a reliable opinion on the likelihood of liquidation of a firm intending to commence with reorganisation proceedings. The aim is to speed up the liquidation of economically inefficient firms that attempt to seek shelter in reorganisation.

Setting: The study was conducted in South Africa and made use of experts in the field of turnaround management.

Methods: The indicators were derived from a strong and widely used managerial tool known as the Delphi method. The relative importance of each element was allocated using a powerful mathematical model known as the analytic hierarchy process (AHP).

Results: This study identified key indicators for the nine liabilities with accompanied weights of relative importance for a likelihood of liquidation framework. Anchor scale values are proposed for each indicator to assist in its application. The framework is timely in its application, considers the availability of accurate data, inexpensive to implement and easy to interpret.

Conclusion: The likelihood of liquidation framework was developed to include a broader spectrum of liabilities to assist in deciding the viability of recovery of a firm in reorganisation.

Keywords: turnaround; reorganisation; insolvency; commencement standard; AHP; Delphi technique.

Introduction

In recent years there has been a significant contribution made by researchers and practitioners on the prediction of business failures (Wu, Gaunt & Gray 2010:36). Failure can be defined in various ways, taking into consideration the specific interest or condition of the firm under scrutiny. Reorganisation[1] is often an important vehicle for failing firms and their creditors to pursue intensive turnaround strategies. However, one is often under the impression to conclude that reorganisation has failed if the firm is subsequently liquidated or sold, whereas this may be the desired outcome of an efficient process. Reorganisation is aimed at rescuing an economically viable firm that experiences temporary financial difficulty – financially distressed (Franks & Torous 1992). Critical to the decision to pursue turnaround efforts is the likelihood of the firm succumbing to liquidation. An economically distressed firm will not find any salvation within reorganisation and will simply erode the value of the firm away. Therefore, a commencement standard looks to screen out severely economically distressed firms that will not benefit from reorganisation proceedings. Such a standard may look to failure prediction models; however, traditional prediction models typically rely on financial metrics and have difficulty in considering other crucial elements of economic viability (Deakin 1977; Trahms, Ndofor & Sirmon 2013:1289). Furthermore, there is criticism over the lack of methodological rigour in identifying the turnaround potential of firms on which to conduct such analysis (Pandit 2000:32; Pearce & Robbins 1993:626). A valuable contribution to research in this field must therefore seek to redress this neglect, forming new ways of filtering these phenomena from proceedings. The likelihood of liquidation framework (LOL) was developed to include a broader spectrum

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1.The word 'reorganisation' is occasionally used in a general sense to denote the rehabilitation of a distressed business, but it may also be used more narrowly to refer only to the process of rehabilitation under a formally recognised legal insolvency procedure, whose statutory titles may vary from administration, business rescue or reorganisation.

of liabilities to assist in deciding the viability of recovery of a firm in reorganisation.

The LOL is a basic arrangement of liabilities used to determine the emergence of the firm from reorganisation in a solvent condition and with reasonable prospects of financial stability and success. The framework has been developed using the South African business rescue reorganisation process in a manner that allows adaptation to various other jurisdictions.

This article aims to continue the development of the LOL for its eventual use in practice. To do so, the study (1) identifies key indicators for the nine liabilities, then (2) investigates the relative importance of each liability/indicator, and finally (3) proposes anchor scale values for each indicator. The indicators were derived from a strong and widely used managerial tool known as the Delphi method. The relative importance of each element was allocated using a powerful mathematical model known as the analytic hierarchy process (AHP). The enhanced framework is expected to provide some indication of the reasonable prospect of a firm prior to the commencement of business rescue proceedings. If effective, this framework stands to reduce the number of economically distressed firms from abusing proceedings and ultimately preserve firm value.

The likelihood of liquidation framework

The LOL consists of nine liabilities that were derived from existing turnaround literature. For example, the liability of creditor composition is a construct drawn from Ayotte and Morrison (2009), Bergström, Eisenberg and Sundgren (2002) and Campbell (1996). Each liability represents an acute vulnerability of a firm during the formal turnaround process. The framework consolidates all these liabilities to assess the prospect of the firm succumbing to liquidation. Under the evidence of absence, LOL removes the intrinsic variables associated with failure to assume a reasonable prospect at the commencement of business rescue for the recovery of a firm. This however assumes the value maximisation principle remains valid. The framework allows decision-makers to consider the relevant factors before commencing reorganisation proceedings given the limited information and data accuracy associated at that point in time. The nine liabilities include functional business model, reorganisational slack, creditor composition, stakeholder influence, liability of smallness, liability of data, liability of leadership, liability of obsolescence and external legitimacy.

Each liability contributes to the overall likelihood of liquidation. In some circumstances, a liability may be unlikely, while in others it may serve as a 'fatal liability' thereby suggesting liquidation is almost certain. The intensity of each liability is determined by its indicators which were derived using the Delphi study.

Research methods and design

The study utilised a mixed method research design that assisted in completing the LOL framework. In line with

Creswell (2012:543), an exploratory sequential mixed methods design, or two-phase model, is best suited for the task. This method involves the procedure of first gathering qualitative data to explore a phenomenon and then collecting quantitative data to explain relationships found in the qualitative data. Therefore, the researchers were able to identify measures actually grounded in the data obtained from study participants. The study consisted of two primary research techniques, Delphi and AHP, which fell into a sequence of steps as depicted in Figure 1. The use of these two methods in exploratory sequential mixed methods design was reinforced by Khorramshahgol and Moustakis (1988) when they termed the methodology the Delphic hierarchy process.

An initial set of between five and seven indicators were derived for each liability by the researchers from the literature. Each indicator was given a title and definition that were presented to the participants in the first round of the Delphi study. The participants consisted of 11 experts who were purposefully selected based on their knowledge and experience in the field of business turnaround. The sample size was also considered acceptable for both studies as it remains exploratory in nature (Cheng & Li 2002:197; Okoli & Pawlowski 2004:18; Wong & Li 2008:12). These experts were considered eligible to be invited to participate in the Delphi study as they shared related backgrounds and experiences concerning the target issue, were capable of contributing helpful inputs, and were willing to revise their initial or previous judgments for the purpose of attaining consensus. The researchers closely examined and seriously considered the qualifications of participants in addition to their acclaim and respect within the target groups of experts. The participants ranged from academics, business rescue practitioners to corporate recovery consultants. The methodology and findings from the two primary research techniques are described next.

The Delphi method

The Delphi method is a widely used and accepted method for attaining convergence of opinion regarding real-world knowledge solicited from experts in certain fields. The technique can be mostly attributed to Dalkey, Brown and Cochran (1969), who maintained that 'two heads are better than one, or...n heads are better than one' (Dalkey et al. 1969:6). According to Dalkey, there are three features of
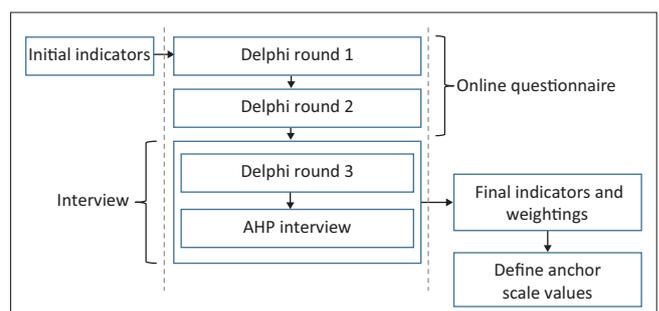

FIGURE 1: An overview of the research process used.

Delphi: (1) anonymity; (2) controlled feedback and (3) statistical group response. Anonymity is preserved by using a questionnaire and thereby lessening the impact of dominant individuals. Controlled feedback is ensured by conducting the study in a sequence of rounds where the results thereof are shared with the participants at the end of each round to promote objectivity. Finally, a broad definition of the response aims to decrease group pressure for conformity as towards the conclusion of the rounds there may still be a significant spread in individual opinions. Keeping this in mind, the inclusive group response is designed to assure that the opinion of every participant is incorporated in the final response.

Linstone and Turoff (2002) outline the process of a conventional Delphi study as firstly:

> [D]esigning a questionnaire which is sent to a larger participant group. After the questionnaire is returned, the researcher summarises the feedback and, based upon the results, develops a new questionnaire for the participant group. The participant group were given at least an opportunity to re-evaluate its original answers based upon examination of the group response. To a degree, this form of Delphi is a combination of a polling procedure and a conference procedure which attempts to shift a significant portion of the effort needed for individuals to communicate from the larger participant group to the smaller monitor team. (p. 5)

This study made use of an online questionnaire for the first and second round that ran participants through a video tutorial explaining the LOL framework, objective of the study and what their role is in the Delphi process. The participants were asked to evaluate and add indicators in consideration of the SMART criteria (Specific, Measurable, Attainable, Realistic, Time-sensitive).

SMART

The SMART criteria assisted the participants in assessing and suggesting indicators that were relevant in relation to the study's objective. Each of the SMART elements is defined as follows:

- *Specific*: Indicators should be detailed and as specific as possible. Loose, broad or vague indicators are not desirable.
- *Measurable*: In order to clearly determine a value, indicators should not be ambiguous but rather as clear and concrete as possible. It is important that an indicator can be measurable. The measure may be quantitative or qualitative, but measurement should be against a standard of performance and a standard of expectation understood by an industry professional.
- *Attainable and aggressive*: Success or failure is only fairly attributed against practical indicators. Indicators should not be out of reach. They should be reasonable and attainable within the typically hostile and chaotic environment experienced in business rescue. However, setting indicators is a balance between this degree of 'attainability' and challenge and aspiration.
- *Realistic and result-oriented*: Extending the concept of attainability, a goal should be realistic. It is possible that a goal could be set that is attainable, but not realistic in the particular working conditions. Being realistic in the choice of indicators is helpful in examining the availability of resources and selecting indicators.
- *Time-sensitive*: Indicators should be selected in view of the strict timelines afforded in business rescue. Success is dependant on finding information within a few days.

During the first-round, participants were obligated to suggest two of their own indicators before being presented with the initial set compiled by the researchers. Participants then had the opportunity to accept, reject or modify each indicator while providing their reasoning as well. Participants could add new indicators at any point during all three rounds.

To assist the participants the researchers compiled the first set of indicators that were derived from the literature and the researchers' knowledge and experience. These initial indicators ranged from standard to controversial in nature. They aimed to trigger innovative thinking and provide critical mass for the Delphi process to work from. During each round, the participants were asked to accept, modify or reject each indicator with reasoning and with a confidence level. New indicators could be suggested at any point during the study. After each round, the researchers reviewed all the indicators and incorporated all the participants' input based on the sound reasoning and level of confidence. A new set of indicators then emerged and were presented to the group with any modifications being clearly highlighted. Thereafter, each round offered individuals an opportunity to modify or refine their judgments based on their reaction to the collective views of the group.

A satisfactory level of consensus was defined in this study when the participants no longer could add new indicators and accepted the remaining indicators. Minor modifications or rejections with low confidence levels and weak reasoning were regarded insufficient to warrant changes in the last round.

Ethical considerations

This article followed all ethical standards for research without direct contact with human or animal subjects.

Results

The first round of the Delphi study resulted in the most significant amount of changes and additions by the participants. Synthesising new indicators proved difficult because of the varying perspectives of the participants; however, this brought new and intriguing views to the fold. The number of indicators ranged from 56 in round one, 67 in round two and 41 in round three. The first round focused less on consensus and more on exposing all the differing positions advocated and the principal pro and con arguments for those positions. The average level of

confidence increased progressively through the rounds as consensus emerged. A satisfactory consensus level was reached, by incorporating agreement and importance aspects, in round three with the final indicators emerging from the study listed in Table 1.

During the study, participants questioned indicators in their entirety as well as more detailed aspects of the definitions. The inclusion of the SMART criteria certainly helped the participants build consensus faster as it was often referenced during all three rounds. In an interesting turn of events, the participants took a preference to non-financial metrics in describing indicators. This may be the result of data integrity issues, time constraints and data lead times that are typically prone to information at commencement. The 41 indicators in Table 1 provided a non-exhaustive list obtained from numerous experts with domain knowledge that asses the likelihood of liquidation of a firm before commencing with reorganisation proceedings.

Analytic hierarchy process

The AHP was developed by Thomas L. Saaty as a decision-making theory. It is a structural method that helps to elicit preference of expert opinion from decision makers using a multi-criteria decision-making method. Analytic hierarchy process allows decision makers to rank, select, evaluate and benchmark a wide variety of decision alternatives using the systematic procedure (Forman & Gass 2001; Golden, Wasil & Harker 1989; Saaty & Vargas 2012). The model utilises a hierarchical structure which consists of an objective, criteria, sub-criteria and alternatives. Based on pairwise comparison judgments, AHP integrates both criteria importance and alternative preference measures into a single overall score for ranking decision alternatives (Saaty 1990). The versatility of the AHP method can incorporate both qualitative and quantitative approaches to solve complex decision problems (Cheng & Li 2002). Analytic hierarchy process, therefore, offers a holistic analysis of complex relationships inherent in a problem and assists the decision maker in assessing whether the evaluation criteria are of the same order of importance so that the decision maker can compare such homogeneous alternatives accurately.

Analytic hierarchy process harnesses domain knowledge from experts and forms a systematic framework for conducting structured group decisions for a large number of both quantitative (financial ratios) and qualitative (non-financial) criteria (Park & Han 2002:3). This study applies the AHP methodology to exploit domain knowledge in acquiring weights from domain experts. The AHP approach has been applied to a variety of complex decisions in the business domain, including the problem of granting corporate credit, portfolio management and the assignment of sovereign debt ratings, among other business decision problems (Bolster, Janjigian & Trahan 1995; Clark et al. 1997; Lee, Kwak & Han 1995; Levary & Wan 1999).

This study used the AHP method to specify numerical weights representing the relative importance of each liability and indicator in the LOL framework. Participants were asked to consider the importance of one element over the other in consideration of the following objective: 'it's importance in increasing the likelihood of liquidation of a firm on commencement of business rescue'. The LOL framework was integrated within AHP by using the liabilities as criteria and the indicators identified by the Delphi process as sub-criteria. Pair-wise comparison judgments were made concerning the attributes of one level of hierarchy given the attribute of the next higher level of hierarchy – AHP consists of three principles namely, decomposition, comparative judgment and priority synthesis (Saaty 1990).

Using the AHP method for group decision making involves merging responses using geometric means (Lee et al. 1995:4; Saaty 2008:95). Dyer and Forman (1992) highlight three benefits for AHP in group decision making namely, (1) it accommodates both tangible and intangible characteristics, individual values and shared values in the group decision process, (2) assists in structuring a group decision so that the discussion centres on objectives rather than on alternatives and (3) enables the discussion to continue until all available and pertinent information have been considered.

Analytic hierarchy process is also able to solicit consistent subjective expert judgment using a consistency test. The consistency of the results is measured using a consistency ratio (actually 'inconsistency ratio'). The liabilities and indicators were regarded as highly interrelated and therefore a high consistency ratio was allowed. The consistency ratio of less than 10% is considered adequate to interpret the results (Carnero 2005:546). Saaty and Vargas (2012) recommend using a normalised eigenvector approach, which is best implemented by computer software such as AHP-OS.

The group consensus indicator quantifies the level of agreement on the outcoming priorities between participants. The consensus indicator is a derivative from the concept of diversity based on Shannon alpha and beta entropy (Jost 2006). The measure reflects the homogeneity of priorities between the participants and can also be interpreted as a measure of overlap between priorities of the group members. Note though that group decision-making aims to obtain consent, not necessarily the agreement of the participants by accommodating views of all parties involved to attain a decision that will yield what will be beneficial to the entire group (Herrera-Viedma et al. 2014:4). The consensus indicator, however, should be strictly distinguished from the consistency ratio.

The relative importance of the criteria and sub-criteria were rated by the nine-point scale proposed by Saaty (1990:15), as listed in Table 2. The scale distinguishes the levels of relative importance from equal, moderate, strong, very strong, to an extreme level by 1, 3, 5, 7 and 9, respectively. The intermediate values between two adjacent arguments are represented by 2, 4, 6 and 8.

TABLE 1: Final indicators and definitions from round three of the Delphi study.

Indicator	Definition
Functional business model	
Customer demand	The likelihood of liquidation is expected to increase as demand diminishes for a firm's product. Does the firm still pose viable communication, distribution and sales channels with its customers? Unless rectified, growth in turnover below inflation or industry norms would increase liquidation likelihood.
Value proposition	A central construct in reorganisation is the firm's ability to produce value adding activities to support the repayment of debts. If the firm's value proposition cannot be established, then the likelihood of liquidation should be assumed high. Indicated by insufficient or decrease in gross margin.
Resource alignment	Are the firm's key resources and capabilities aligned with the demands of the competitive environment and does it possess the ability to realign or acquire the needed resources? Significant misalignment or a lack of resources would signal a higher likelihood of liquidation.
Cash cycle sustainability	Is the cash conversion cycle (including the impact of new credit terms) aligned to the operating model of the company? In other words, can the firm afford the capital cost of its cash flow cycle?
Revenue streams	A clear and defined revenue stream exists for the firm. If clarity on how and through what pricing mechanisms a business generates its earnings cannot be made, then liquidation likelihood will rise.
Reorganisational slack	
Total financial slack	The total slack available of a firm can provide an indication of a firm's capacity to free short-term slack. Businesses with unavailable resources at the time of the turnaround attempt would be more constrained in their ability to initiate appropriate remedial measures. Therefore, firms with more financial slack have a better chance of surviving and staging a turnaround. Slack = (1 - (Total debt/Total assets)) × 100). Firms with lower values have more depleted their debt capacity and therefore increased the likelihood of liquidation.
Free assets	Distressed companies with sufficient free assets are more likely to avoid liquidation because it increases their ability to acquire the additional funds necessary to enact a successful turnaround, and it encourages the continued support of existing lenders as sufficient assets are available to repay loans if required. Free assets percentage = (Total tangible assets - Secured loans)/Total tangible assets.
Operating free cash flow	Operating free cash flow can be used to determine the firm's future slack position. OFCF = EBIT(1 - tax rate) + depreciation - CAPEX - working capital - other assets.
Operational status	If business operations have ceased, accessing short-term sources of slack will be unlikely. Thus, increasing the likelihood of liquidation.
Debt composition	The risk tolerance of current investors can indicate the propensity to fund PCF. The lower the degree of variability in investment returns that an investor is willing to withstand, the less chance of PCF and the higher likelihood of liquidation.
Creditor composition	
Secured creditors proportion	Secured creditors are likely to demand payments or claims equal to the market value of their lien assets in return for supporting the debtor's rescue plan. Further, each secured creditor will favour negotiating individually with the debtor the value of its claim and its treatment under the rescue plan. The additional bargaining costs generated by additional secured creditors are hypothesised to increase the likelihood of liquidation. A higher proportion of secured debt to unsecured debt may favour a risk adverse behaviour and result in a higher likelihood of liquidation.
Average claim size	Where the average claim size is relatively high, proceedings may be manipulated by a small number of creditors and reducing the powers of the practitioner. A fragmented creditor base or supply creditors are less likely to disrupt/manipulate proceedings and therefore decrease the likelihood of liquidation. Average claim size = total value of claims/number of claims.
Over-indebtedness	Likelihood of liquidation is expected to be high with little prospect of a dividend pay-out to unsecured creditors.
Claim age	Long outstanding creditor claims may result in less support for rescue. Accounts payable ageing report could indicate overstretched terms that will hinder creditor support. The older the claims, the greater the likelihood of liquidation.
Stakeholder influence	
Governing stakeholders	The lack of interest/support from governing stakeholders, based on their network position and cohesive/legitimate power, to drive and support proceedings will increase the likelihood of liquidation.
Stakeholder salience	The degree to which managers/practitioners give priority to competing stakeholder claims. Stakeholder salience will increase with influence, legitimacy and urgency. The lack of voting power may aggravate this further. The greater priority given to latent stakeholders, as those having low salience arising from only one attribute, so the likelihood of liquidation increases.
Dangerous stakeholders'	Where urgency and influence characterise a stakeholder who lacks legitimacy, that stakeholder will be coercive and possibly violent, making the stakeholder 'dangerous', literally, to the firm. 'Coercion' is suggested as a descriptor because the use of coercive power often accompanies illegitimate status. Increased dangerous stakeholders will lead to a higher likelihood of liquidation.
Financial institutions	Evaluates how other banks and financial institutions perceive the credibility of the firm. The collateral and other conditions that other banks and financial institutions require from the business can be considered as the criteria. Poor support from financial institutions can increase the likelihood of liquidation.
Conflict of interest	Influential stakeholders with conflict of interests may inhibit turnaround activities and increase the likelihood of liquidation. Cross surety positions, dual shareholder positions or shareholder/management relationship may cause this.
Liability of smallness	
Firm size	Larger companies are more likely to recover than smaller firms because of economies of scale of direct administration costs. As a company's turnover or PI score falls below a viable threshold, so the likelihood of liquidation is expected to increase.
Raising capital	Larger firms have been found to be better equipped to raise distressed finance because of their previous track record or they have a weighted balance sheet to attract distress investment. The prolonged attempts at raising PCF would erode the company value and therefore increase the likelihood of liquidation.
Reorganisation costs	Smaller firms may not be able to absorb the cost of the rescue, in particular, the practitioner and legal fees. If the firm is restricted by any means of its size in absorbing these costs, then the likelihood of liquidation is believed to be high.
Reorganisation complexity	The extent of decline and degree of turnaround complexity could exceed the cost/benefit. The likelihood of liquidation is expected to rise with the severity of distress and complexity.
Liability of data	
Accessibility	This dimension reflects the ease of data attainability. Turnaround is virtually impossible without the timely access to critical information. The longer it is expected to gather the necessary information required to perform a rescue, the greater the likelihood of liquidation.
Completeness	Performing any sort of turnaround or restructuring based on incomplete information is reckless. If sufficient information cannot be obtained timeously, then the likelihood of liquidation should be assumed high.
Data ethics	Acts of upwards earnings management, fraud or any sort of data manipulation by management could suggest an overall lack of data integrity. Such behaviour may bring the integrity of the firm's financials into question leading to a higher likelihood of liquidation.
Tax integrity	Filed income tax returns that correlate to actual financial information. If discrepancies exist this may indicate data integrity issues and result in a higher likelihood of liquidation.
Audit lag	Average audit lag (in months) over the 3-year period preceding rescue may suggest poor accounting systems. The practice of delaying the submission of the accounts may be more widespread and could be one important manifestation of the manipulation of the accounting framework. Such behaviour coupled with qualified audits could indicate that the integrity of data to be low and therefore increase the likelihood of liquidation.
Liability of leadership	
Loss of skills	Loss of key management with institutional memory makes it difficult to resolve issues and run the business. Staff attrition over past 6 months will lead to a higher likelihood of liquidation.
Management competencies	Poor managerial skills have been associated with firm failure. Liquidation likelihood is expected to rise as management ability weakens.
Board composition	The composition of the Board of Directors to include both independent and non-independent directors. The less balanced the board is, the higher the liquidation.

Table 1 continues on the next page →

TABLE 1 (Continues...): Final indicators and definitions from round three of the Delphi study.

Indicator	Definition
Leadership orientation	The inability of the leadership of the company (CEO/Entrepreneur/Top management) to acknowledge distress and restructure responsibly towards a new vision to rescue the firm will increase liquidation likelihood.
Liability of obsolescence	
Government policies, taxation and regulation	Changes in legislation or tax reforms may render the firm unviable. If these changes affect the firm directly, then the likelihood of liquidation should be adjusted accordingly.
Urgency of decline	The urgency of decline looks at the rate of decline caused by environmental degradation. A rapid descent may indicate an inability to adapt to the external environment and liquidation likelihood will be high.
Technology adoption	Does the firm possess the ability to adapt to the technological disruptions in the external environment? If the company cannot absorb new technologies in time the likelihood of liquidation in deemed high.
Product relevance	Changes in the external environment may result in the product becoming obsolete. As the relevance of a product in a market decline, so the likelihood of liquidation increases.
External legitimacy	
Process integrity capacity	This is the alignment of the firm's moral awareness, deliberation, character and conduct on a sustained basis so that reputation becomes a major intangible asset to be carefully nurtured and protected. The more individuals and groups in the firm exhibit these moral processes, the stronger the aggregate business process integrity capacity will become and the smaller the likelihood of liquidation.
System integrity capacity	This is the aligned implementation of organisational policies that institutionalise ongoing moral improvement within and between organisations and enable extra-organisational contexts to provide a morally supportive framework for integrity-building environments through statistically measured performance improvements. Collective commitment work cultures, for example, emerge by the regular practice of principled moral reasoning in everyday business decision-making, but they are sustained only if system integrity capacity processes are institutionalised.
Supplier experience	Will key suppliers continue to support the firm during rescue based on their experience? If the relationship with key suppliers is too badly damaged, then the likelihood of liquidation is higher.
Internal credibility	Measures how employees of the firm perceive the company itself. If the consensus of employees is very negative, it may lessen the external legitimacy of the firm and result in a higher likelihood of liquidation.
Public perception	Negative public perception of the firm or their product resulting from rumours, court proceedings or fraud allegations may hamper recovery efforts and increase the likelihood of liquidation.

TABLE 2: The analytic hierarchy process pairwise comparison scale.

Intensity of importance	Definition	Explanation
1	Equal importance	Two indicators/liabilities contribute equally to the objective
3	Moderate importance	Experience and judgment slightly favoured one indicator/liability over another
5	Strong importance	Experience and judgment strongly favour one indicator/liability over another
7	Very strong importance	An indicator/liability is favoured very strongly over another; its dominance demonstrated in practice
9	Extreme importance	The evidence favouring one indicator/liability over another is of the highest possible order of affirmation

Source: Saaty, T.L., 1990, 'How to make a decision: The analytic hierarchy process', *European Journal of Operational Research* 48(1), 9–26. https://doi.org/10.1016/0377-2217(90)90057-I
Note: 2, 4, 6, 8 values in-between.

A comparison matrix is created by comparing pairs of criteria and sub-criteria (Saaty 1990:12). The pairwise comparison assists in judging independently the contribution of each criterion to the objective. The priority synthesis computes a composite weight for each alternative, based on preferences ascertained through the comparison matrix. Alternatives in this study took the form of various variables obtained from a distressed firm. Using the composite weight, the relative priority of each alternative can be obtained. A sensitivity analysis is applied to show how criteria weighting deviations can affect the changes of ranks of alternatives.

A questionnaire-based field survey was used to collect the participants' ratings. Through individual interviews with participants the data was concurrently transferred into an online application to test, in real time, the consistency of the data (Goepel 2017). This was done for several reasons, first, to reduce the time burden on participants as the number of pairwise comparisons were substantial. Secondly, the participant was alerted to when they exceeded the maximum consistency ratio and could make the necessary alterations without being influenced by the software's recommendations. During the interview, participants were allowed to re-examine their comparisons, calculated weights and the final results derived from their initial and subsequent responses. They were also allowed to assess the results and inspect the reasonableness of the rankings until they were completely satisfied with the outcomes. Finally, the interview also allowed the researchers to capture deeper insights into the participant's choices which lead to some fascinating findings.

Discussion

The output showcased in Table 3, Table 4 and Table 5 represent the final judgments of the group. Obviously, these tables were the results of many debates, persuasions and discussions. For example, there were occasions when some participants debated the meaning of their high inconsistency of choices which gave researchers deeper insight. It became obvious early on that AHP could contribute significantly more than just prioritising elements.

To analyse the survey findings, the judgment matrices were pair-wise compared and computed using the use of a software package (Goepel 2017). The AHP calculations therefore have been omitted in line with the recent articles (Chen et al. 2017; Herrera-Viedma et al. 2014; Okwir et al. 2017; Raviv, Shapira & Fishbain 2017). The local priority weights of all the liabilities and indicators were first calculated and then combined with all successive hierarchical levels in each matrix to obtain a global priority vector. A list of the global priorities for each indicator is presented in Table 3. The higher the mean weight of global priority vector, the greater the relative importance. Therefore, this serves to distinguish the more important indicators from the less important ones. Beyond the global priorities, the AHP survey revealed a number of interesting and unexpected results.

TABLE 3: Consolidated group weightings and ranking for the liabilities from analytic hierarchy process.

Liability	Priority (%)	Rank
Functional business model	10.0	5
Reorganisational slack	14.7	2
Creditor composition	9.1	7
Stakeholder influence	8.4	8
Liability of smallness	9.3	6
Liability of data	11.2	4
Liability of leadership	14.5	3
Liability of obsolescence	16.1	1
External legitimacy	6.6	9

TABLE 4: Consolidated priorities for the sub-criteria with respect to liability of leadership.

Liability	Priority (%)	Rank	Global priority (%)
Loss of skills	25.3	2	3.67
Management competencies	43.8	1	6.35
Board composition	11.3	4	1.64
Leadership orientation	19.7	3	2.85
-	100	-	14.51

Surprisingly, participants considered external legitimacy (6.6%) to be the least important liability. The external legitimacy concerns the perceived integrity of the business by its external stakeholders. The low ranking of this liability may stem from the fact that the participants considered direct stakeholders of the firm to be more significant and influential in increasing the likelihood of liquidation. The AHP group consensus of 43.2% across the liabilities is regarded by Goepel (2013) as very low signifying a high diversity of judgments. Although participants were not able to add or remove any liability, the indicators selected in the Delphi process ultimately defined each liability. This probably explains the broad range of indicators that evolved from the Delphi process.

The consolidated group weightings for the liabilities (main criteria) are listed in Table 3. Participants reported that the liability of obsolescence (16.1%) is the most important liability in increasing the likelihood of liquidation of a firm on commencement of business rescue. The liability carried by reorganisational slack (14.7%) and liability of leadership (14.5%) weighed in slightly less respectively. The consolidated priorities for the indicators concerning liability of leadership are listed in Table 4. This liability seems to be mostly influenced by the management lower-case is perfect. (43.8% local priority) indicator which emerged with one of the highest global priorities as well. During the interviews, participants reiterated this by affirming that the competency of management plays a significant role in ensuring the firms' success. While the business rescue practitioner can substitute the leadership of a firm this indicator may suggest that in practice this is unlikely to happen fast enough. This supports the work of Lohrke, Bedeian and Palmer (2004:79) and Smith and Graves (2005:306) in that top management competency will directly affect the likelihood of reversing organisational decline.

TABLE 5: Likelihood of liquidation framework indicators with relative priorities and anchor scale values.

Indicator	Global priority (%)	Anchor scale values	
		1 = likely	5 = Unlikely
Functional business model (5) 10%			
Customer demand	2.22	None	Sufficient
Value proposition	1.86	Uncertain	Established
Resource alignment	0.77	Misaligned	Aligned
Cash cycle sustainability	3.30	Misaligned	Aligned
Revenue streams	1.84	Unclear	Clearly defined
Reorganisational slack (2) 14.7%			
Total financial slack	2.04	No slack	Sufficient slack
Free assets	2.21	Low free assets percentage	High free assets percentage
Operating free cash flow	5.23	Low	High
Operational status	2.84	Non-operational	Operational
Debt composition	2.37	Risk adverse creditors	Risk seeking creditors
Creditor composition (7) 9.1%			
Secured creditors proportion	3.72	High secured/ unsecured debt	Low secured/ unsecured debt
Average claim size	2.30	Large	Small
Over-indebtedness	2.33	High	Low
Claim age	0.78	Old	Young
Stakeholder influence (8) 8.4%			
Governing stakeholders	0.81	Weak support/ interest	Strong support/ interest
Stakeholder salience	1.43	Misaligned	Aligned
Dangerous stakeholders	2.24	Present	None
Financial institutions	3.14	Adverse to BR	Neutral
Conflict of interest	0.80	High	Low
Liability of smallness (6) 9.3%			
Firm size	1.93	Small (PI ...)	Large
Raising capital	2.65	No experience	Extensive
Reorganisation costs	2.98	High	Low cost
Reorganisation complexity	1.72	Complex	Simple
Liability of data (4) 11.2%			
Accessibility	1.79	Difficult	Attainable
Completeness	1.68	Inadequate	Adequate
Data ethics	4.50	Unreliable	Reliable
Tax integrity	1.99	Questionable	Sound
Audit lag	1.26	Extensive	Acceptable
Liability of leadership (3) 14.5%			
Loss of skills	3.67	High	Low
Management competencies	6.35	Poor	Sufficient
Board composition	1.64	Disproportionate	Balanced
Leadership orientation	2.85	Weak	Sufficient
Liability of obsolescence (1) 16.1%			
Government policies and regulation	2.36	Unfavourable	Unprejudicial
Urgency of decline	5.15	Rapid	None
Technology adoption	2.32	Poor	Norm
Product relevance	6.31	Irrelevant	Satisfactory
External legitimacy (9) 6.6%			
Process integrity capacity	1.57	Weak	Satisfactory
System integrity capacity	0.86	Weak	Satisfactory
Supplier experience	2.30	Poor	Normal
Internal credibility	1.15	Negative	Acceptable
Public perception	0.74	Negative	Acceptable

The weightings for the liabilities ranged between 16.1% and 6.6%, which suggest a relatively even distribution. The strongest liability being liability of obsolescence (16.1%) is mostly made-up of urgency of decline and product relevance indicators.

Two indicators that emerged the most influential within the LOL framework were management competencies (6.3%) and product relevance (6.3%). The latter indicator shares a close resemblance to the customer demand (2.2%) indicator; however, it exhibits a key distinction that the researchers suspect accounts for its prevalent status. Customer demand focuses on diminishing demand for a firm's product resulting from internal factors such as a breakdown in communication, distribution and sales channels with its customers. While product relevance is orientated around changes in the external environment that may result in the product becoming obsolete. The distinction highlights an important feature of the LOL framework in that it is more concerned with factors that will have a certain impact on the outcome of liquidation rather than factors that could be rehabilitated in rescue.

Remaining within the liability of obsolescence, the third most influential indicator was the urgency of decline (5.1%). Francis and Desai (2005) echo this finding by explaining when the erosion of resources is severe (magnitude) and rapid (time), turnaround becomes exceedingly difficult. Interestingly participants with a predominately business background favoured this indicator. The urgency of decline at the commencement of proceedings can indicate the time and resources available to attempt any rehabilitation efforts.

This study reported a positive overall consistency ratio of 2.4%, which is far below the recommended 10% acceptable margin (Carnero 2005:546) and can be regarded as reasonably consistent. Although the participants individually pushed the limits of the ratio the consolidated matrix ratio was more than acceptable. Miller (1956) warns about the human limits on the capacity for processing information while dealing with several criteria and as the study involved numerous interrelated indicators this was a difficult task for participants.

A group consensus of 54.8% across all the indicators indicates a high diversity of judgments (100% refers to absolute consensus). This was a particularly interesting finding considering all the indicators emerged from Delphi study that involved the same group of participants. This finding may suggest that the perception of reasonable prospect of a firm varies between experts and could account for the conflict that arises around this term. The consensus indicator allows for deeper analysis of sub-groups (clusters) of participants with high consensus among themselves, but with a low consensus to other sub-groups. Bard and Sousk (1990:227) remind, however, that 'from the standpoint of consensus building, the AHP provides an accessible data format and a logical means of synthesising judgment. The consequences of individual responses are easily traced through the computations and can be quickly revised when the situation warrants'.

Group consensus was highest in the liability of leadership (74.6%), stakeholder influence (74.1%) and creditor composition (71.1%). Curiously, participants from financial backgrounds

weighted Operational Status of the firm far higher than the other participants. Conversely, the chosen business rescue practitioners signalled indicators such as secured creditors proportion and dangerous stakeholders proportionally more. Analytic hierarchy process accommodated each participant's views in order to attain a decision that yielded what will be beneficial to the entire group and not necessarily to the particular individuals involved. The global priorities listed in Table 5 reflect the views of a balanced group of experts on the importance of each indicator in increasing the likelihood of liquidation of a firm on commencement of business rescue.

Proposed framework

To recap, the objective of this study is to continue the development of the LOL framework for its eventual use in practice. The results from the Delphi process identified 41 key indicators for the nine liabilities. Analytic hierarchy process investigated the relative importance of each liability/indicator from which weights were derived. Finally, to complete the LOL framework, the study proposes anchor scale values for each indicator.

Assigning values to the likelihood of liquidation framework indicators

To transform the qualitative indicators into a form more suited to computing the likelihood of liquidation the study adopted a five-point scale to assess the magnitude of an indicator. For each indicator, the researchers have recommended anchor values listed in Table 5. The anchor values aim to provide a standardised approach to assessing the magnitude of an indicator in a firm. The popular Likert scale (1–5) was applied between the two values in equal intervals to measure the proportionality of severity of the indicator. The scale values are anchored with one contributing significantly to the outcome of liquidation and five indicating an unlikely impact on the eventuality of liquidation. The unlikely anchor value (5) reflects the position where the indicator has no contributing effect to the LOL score. Therefore, the indicator is measured on a monotone increasing semantic differential scale consisting of five negative adjectival statements (see Table 5). The anchor scale value chosen to best describe an indicator's manifestation in a firm is referred to as an indicator's value (a).

Likelihood of liquidation framework score

The LOL score is a closed unit interval [0, 1] that signals the firms' likelihood of liquidation at the commencement of reorganisation proceedings. A value of 0 will indicate a high likelihood of liquidation while a value of 1 will indicate that liquidation is unlikely. It is important to note that the LOL score is not a prediction of failure but an indication at a particular point in time of the likelihood of liquidation and should be used to determine if reorganisation is suitable for the value maximisation of the firm. The LOL score can be calculated using the following formula:

$$LoL\ Score = \sum_{i=1}^{N} \frac{(a_i - 1)}{4} w_i \qquad \text{[Eqn 1]}$$

where N is the number of indicators (41), a_i is the value for each indicator with i and a_i (1, 2, 3, 4, 5) and w_i is the weight for each indicator i. The LOL score is calculated from the sum of the weighted values of all the indicators. As the LOL score diminishes in value from 1 to 0, so the higher the likelihood of the firm conceding to liquidation there is during reorganisation.

The LOL framework, in addition, considers the notion of a 'fatal liability' which refers to resources (or the absence thereof) that pose an imminent threat to a firm's survival. Should any indicator be deemed significant enough in its totality to induce liquidation then it may be deemed a fatal liability. The identification of a fatal liability therefore results in an LOL score of 0.

Conclusion

It has been a stated desire for academics and practitioners to assess the turnaround potential of a firm prior to any sort of formal restructuring procedure is initiated. The task, however, remains highly complex, and although turnaround research has made significant strides over the past years, there is still little consensus on the matter. As reorganisation grows in popularity within an environment prone to rapid and radical discontinuous change, so the need to screen out severely economically distressed firms becomes more urgent. This article has presented a value weighted assessment framework that estimates the likelihood of the firm entering liquidation. The important features of the framework are that it is timely in its application, considers the availability of accurate data, inexpensive to implement and easy to interpret. Practitioners, judges or directors can use the framework as a decision aid when developing an expert opinion regarding the likelihood of liquidation of a firm intending to commence with reorganisation proceedings. The aim is to speed up the liquidation of economically inefficient firms that attempt to seek shelter in reorganisation.

Prior studies have concentrated on predicting the insolvency filing event or discriminating between healthy and financially distressed firms. This study utilises a robust new liquidation identification methodology that links collective expert decision-making with both financial and non-financial metrics. The LOL framework does not limit the firm's turnaround potential but rather works on the reverse assumption that removes the likelihood of liquidation. Therefore, a commencement decision can be determined without knowledge of the possible turnaround strategies that may be deployed. There is no guarantee in any reorganisation attempt that when a reasonable prospect exists at commencement it will necessarily translate into successful turnaround of the firm.

Limitations and future research

This study does have limitations that should be revisited in future studies. Firstly, the sample size of the study was limited because of the intensive contribution required by experts in the field. Future research may wish to isolate various liabilities and gather data from more experts. Secondly, during AHP analysis there seems to be the notion that experts may exhibit unique perspectives on reasonable prospects that are stereotypical of their organisation. Future research may want to explore this phenomenon further. Non-financial indicators seem to be more useful for practitioners, creditors and judges in assessing reasonable prospect. This relates to another important public policy issue of the relevance of accounting disclosure. It is recommended that the indicators identified be allowed to inspire new perspectives on the going concern qualification. Lastly, the LOL framework lacks statistical evidence of its effectiveness in assessing the likelihood of liquidation. The researchers strongly suggest that the framework is expanded on in future studies. The LOL score has the potential to assist in estimating the recovery rate in reorganisation. It is therefore hoped that this research will provide a stimulus for further work that will help increase the understanding of this highly complex yet intriguing aspect of insolvency.

Acknowledgements

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