

Scope, measurement, impact size and determinants of indirect cost of financial distress

Cost of financial distress

A systematic literature review

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Abstract

Purpose – The purpose of the study is to systematically review the literature of indirect cost of financial distress to understand its scope, measurements, impact size and determinants to synthesis with future research agenda.

Design/methodology/approach – Five-step process of systematic literature review (SLR) as applied by Opoku *et al.* (2015) is used. SLR extracted 47 studies of indirect cost after applying specified search criteria. Data regarding measurement, impact size and determinants are presented and summarised in specified tables.

Findings – SLR showed that the study of indirect cost in developing countries is a literature gap. It is also found that opportunity loss, operating profit loss, market loss and risk premium are most studied indirect costs using legal definition or *ex ante* proxy of financial distress. However, future studies are recommended to use both non-linear leverage and *ex ante* proxy of financial distress. Future studies are also suggested to use the moderation technique while studying the determinants of indirect cost.

Research limitations/implications – Literature selection is based on specific search criteria that can miss some of the other related literature.

Originality/value – The indirect cost of financial distress is more costly and difficult to measure due to its complex concealed effects. A detailed literature of indirect cost is needed to understand the construct that eventually will help to define the future research agenda. To the best of the authors' knowledge, no SLR of indirect cost is provided yet. Therefore, the outcome of this research will be valuable for both academicians and practitioners.

Keywords Systematic review, Financial distress, Indirect cost

Paper type Literature review

1. Introduction

Corporate failure is a costly process, and even ongoing firms bear losses due to temporal deteriorating liquidity problems (Altman and Hotchkiss, 2006). These costs are divided into direct cost of bankruptcy and indirect cost of financial distress. Direct cost incurred at the execution of the process of legal bankruptcy such as attorney's fee, administrator's



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remuneration or some other legal charges (Warner, 1977). On the contrary, indirect costs are hidden losses that firms bear due to temporary liquidity problems (Pindado and Rodrigues, 2005). Indirect costs are not directly associated with the execution of legal bankruptcy. Ongoing firms bear indirect losses during financial distress even if not declared bankrupt subsequently (Chen and Merville, 1999). Here financial distress is defined as liquidity problem where non-bankrupt firms do not have enough proceeds to pay their financial obligations.

Estimation of both the costs is important from various financial perspectives especially regarding optimal capital structure, risk management or working capital strategies (Nor *et al.*, 2012). Literature also showed that the indirect cost is more intense in its magnitude as compared to direct cost. For instance, Altman (1984) documented 10.5 per cent indirect cost as compared to 4 per cent direct cost of firms' market value. However, the literature is diverse and seems chaotic in defining and estimating the *ex ante* concealed effect of indirect cost. For example, in the literature, various proxies of indirect costs such as opportunity loss (Pindado and Rodrigues, 2005), market loss (Bhagat *et al.*, 1994), performance loss (Opler and Titman, 1994) or even management loss Baghai *et al.* (2016) have been used. Similarly, *ex post* (Rose-Green and Dawkins, 2002) and *ex ante* (Pindado and Rodrigues, 2005) definitions of default have been deployed to estimate their indirect effects. Literature also considered some institutional variables such as bankruptcy laws (Gutierrez *et al.*, 2012) and firm-specific contingencies like R&D and specialised product (Opler and Titman, 1994) in evaluating indirect cost.

This assorted view of indirect cost makes it difficult to understand its scope, nature and impact size under different contextual variables. Perhaps the institutional setting, sampling methods and the complexity to define and estimate the *ex ante* hidden effects are the main reasons of diversified views about the indirect cost. However, a detailed review of the literature of indirect cost may provide clarity about the subject matter in this respect. In recent years, various literature reviews of bankruptcy and financial distress regarding their prediction have been presented (Levratto, 2013; Opoku *et al.*, 2015; Sun *et al.*, 2014). However, a systematic review of indirect cost is a literature gap that needs to be fulfilled to understand the complex nature of its real impacts. Therefore, the purpose of this research is to present a systematic literature review (SLR) of indirect cost, particularly about its scope and definition, measurements, impact size, default definition, determinants and methodological consideration. This SLR will assist the researchers to understand the concept of indirect cost that eventually will define the future research agenda.

An SLR "aims at providing a complete, detailed and fair synthesis of evidence related to a topic of interest" (Ampatzoglou *et al.*, 2015). SLR is a contemporary method of literature review and advantageous from various perspectives. The primary advantage of SLR is its systematic approach that helps to understand the topic of interest with specific focus (Jesson *et al.*, 2011). Similarly, SLR is also seen as a rigorous and transparent approach that decreases the biasness and ensures the generalizability of prior results (Mallett *et al.*, 2012). Moreover, SLR also explores the research gaps in a systematic way that helps to define the future research agenda (Booth *et al.*, 2012). Perhaps, considering these advantages, various fields have used this approach to provide a detailed review of their subject matter.

For instance, Kitchenham *et al.* (2009) presented SLR for evidence-based software engineering, Flodmark *et al.* (2006) explored SLR regarding obesity in children, Michie and Williams (2003) studied SLR in psychological health and Connolly *et al.* (2012) investigated SLR in serious games. Similarly, in the field of finance, Ampatzoglou *et al.* (2015) explored financial aspects of managing technical debt and Opoku *et al.* (2015) searched the prior literature of corporate bankruptcy and its related methodological issues by using SLR.

Since, the purpose of this research is to understand the concept of indirect cost to define the future research agenda, so the SLR is a suitable methodology to create a fair synthesis of evidence related to indirect cost of financial distress.

2. Methodology

This research applied a five-step SLR process as defined by [Ampatzoglou et al. \(2015\)](#) and [Opoku et al. \(2015\)](#). The five steps are: scope and objectives of SLR; defining search strategy; filtering criteria; quality assessment and data reporting and analysis. The five-step process of SLR is also presented in [Figure 1](#). Subsequent part of this section will apply these five steps to explore the prior literature of indirect cost.

2.1 Scope and objectives of SLR

The objective of this SLR is to understand the scope, concept, impact size, determinants and methodological consideration related to the indirect cost of financial distress. Specifically, this SLR intends to explore the diverse view of indirect cost under different contextual and environmental settings. Therefore, all the studies that specifically focus on the indirect cost of financial distress came under the scope of SLR.

2.2 Search strategy

To search the required literature, search engine of Google Scholar was used. First, targeted literature was explored using search string of *(intitle:bankruptcy OR intitle:default OR intitle:"financial distress" OR intitle:insolvency) AND (intitle:"indirect cost" OR intitle:"indirect costs")*. This search string extracted articles that contain the word *bankruptcy* and related terms along with the phrase of "indirect cost" in their title. As a result, 44 results were found (accessed on November 2016).

However, it is possible that rather than using *indirect cost* in the title, some of the studies used the cost of financial distress. Therefore, another search string of *(intitle:"financial distress costs") OR (intitle:"bankruptcy cost") OR (intitle:"bankruptcy costs") OR (intitle:"costs of bankruptcy") OR (intitle:"cost of bankruptcy") OR (intitle:"costs of financial distress") OR (intitle:"cost of financial distress")* was applied that explored 343 results (accessed on November 2016). The title of these 343 search results contains the term *cost of financial distress* or other related phrases.

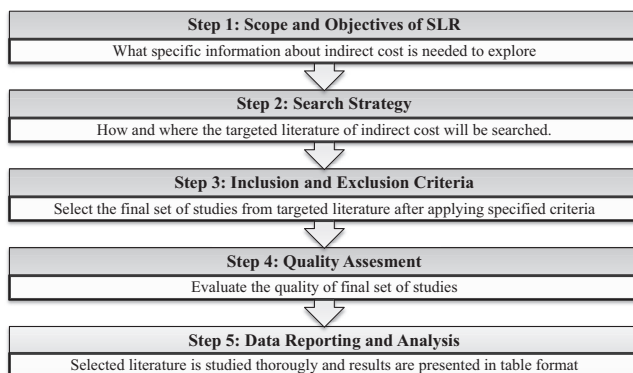


Figure 1.
Five-step process of SLR

2.3 Inclusion and exclusion criteria

Only articles that contain the information regarding the empirical impact of financial distress or bankruptcy on indirect cost are included. However, books, theses and working papers having zero citations are excluded. Similarly, searched articles that just provide citation are disqualified from the final set of articles. Articles in Chinese or other non-English languages are also omitted. These filters are applied in excel on the results extracted from Google Scholar by using *Publish or Perish* software by Harzing (2007). Titles, abstract, conclusions and where needed the main texts of selected articles are studied. It is found that various studies investigated the cost of financial distress to assess the optimal capital structure. However, these studies focus on total cost and do not distinguish between indirect and direct loss. Similarly, some of the studies explored the direct cost of bankruptcy only. Such articles are excluded, as these contradict SLR objectives. After applying all of these filters, 37 relevant studies are extracted. Similarly, the author explored ten studies that were not in the list of above search results. These articles were selected by the author on the basis of his knowledge about the subject matter. In this way, 47 studies are selected for the final set of SLR.

2.4 Quality assessment

The quality of SLR is assessed from two perspectives, i.e. publishing source and content relevancy. Since the selected articles represent only journal articles or the working papers having citations, their quality is satisfactory from publishing perspective. Table I provides the number of articles extracted from different databases. It is observed that most of the selected studies are working paper or conference proceedings (11). However, these studies are relevant to indirect cost and are cited multiple times, and hence, they were included in the final set of articles. Similarly, most of the other articles are published in Wiley (eight) and Elsevier (six) journals. These articles are selected primarily by their relevance with the indirect cost of financial distress. This relevancy is ensured after studying the abstracts, conclusions and, in some cases, the main text. Thus, the quality of publication and content relevancy of the final set of studies is satisfactory.

2.5 Data reporting and analysis

Data of selected articles are presented in Table II. The third column of Table II presents the number of citations of respective study till June 2017. The number of citations were extracted from Google Scholar using *publish or perish* software by Harzing (2007). Altman (1984), Andrade and Kaplan (1998), Gilson (1989), Hoshi *et al.* (1990) and Opler and Titman (1994) are

Table I.
Number of articles
extracted from
different databases

Database	Count of no.
Working Paper/Conferences	11
Wiley Online Library	8
Elsevier	6
Others	6
JSTOR	5
OXFORD Academic Journals	3
Sage	3
Springer	3
IEEE	2
Total	47

Number	Author and year	Citations	Country	Sample	CFD variable	Distress variable	Impact size
1	Bulot <i>et al.</i> (2017)	1	Malaysia	190 financially distressed firms	Opportunity loss	Legal bankruptcy	21.6% average opportunity loss
2	Narayanamoorthy and Zhou (2016)	0	USA	140 patent litigations in the USA	CAR	O-score	O-score beta -0.104 for defendant, insignificant 0.001 for plaintiff
3	Khieu and Pyles (2016)	0	USA	17,154 firm-year observations from Compustat	Excessive cash holdings	Downgrade credit ratings	Downgrade firms increase average 3% cash holdings that decrease their marginal value by 40%
4	Campello <i>et al.</i> (2016)	2	USA	243 firms depository trust and clearing corporation	CDS spread	Z-score, distance to default	246.38 CDS spread for distress, while 104.79 CDS spread for non-distress
5	Baghai <i>et al.</i> (2016)	1	Sweden	3,470 bankruptcies	Management loss	Legal bankruptcy	0.209 average leave rate for treated sample
6	Sautner and Vladimirov (2016)	2	USA and Germany	135 US and 93 German bankruptcies	CAR, opportunity loss	Legal bankruptcy, distance to default	-0.887 abnormal returns before bankruptcy
7	Kristanti (2015)	1	Indonesia	10 family businesses	Operating profit loss	Leverage	Insignificant leverage beta 1.826 for operating profit
8	Graham <i>et al.</i> (2015)	1	USA	190 bankrupt firms	Wage premium	Legal bankruptcy, Z-score	Wage premium for BBB was 7.46, while for AA wage premium was 3.04
9	Keasey <i>et al.</i> (2015)	16	France, UK, Italy, Sweden, Germany	4,072 France, 1,151 Germany, 6,369 Italy, 3,133 Sweden, 3,855 UK firms	Opportunity loss	<i>Pindado et al.</i> (2008)	Probability of financial distress beta 0.0944 for opportunity loss
10	Ertan and Karolyi (2014)	1	Compustat	65,117 observations	CAR	Logit model	8.40% of market value, while cost of manipulation is found 1.68%
11	Gill (2014)	1	BELFIRST EU data	4,070 unlisted firms	Wage premium	Leverage, Z-score	21 %-37% increase in wages as leverage increase
12	Franks and Loranth (2014)	10	Hungary	120 bankrupt firms	Operating profit loss, creditors' loss	Legal bankruptcy	Average operating loss of 24% of pre-filing assets
13	Hortaçsu <i>et al.</i> (2013)	25	USA	6 million completed transactions of used cars	Car price loss	CDS	Loss of 3.5% of firm value for a 1,000-basis-point increase in CDS
14	Javaria <i>et al.</i> (2013)	0	Pakistan	146 Pakistani manufacturing on going firms	Opportunity loss	Dummy variable	0.633 beta for opportunity loss
15	Singhal and Zhu (2013)	18	USA	769 bankruptcy filing	Time spent, investment opportunities	Legal bankruptcy	Diversification beta 0.319 for time

(continued)

Table II. Systematic literature review

Table II.

Number	Author and year	Citations	Country	Sample	CFD variable	Distress variable	Impact size
16	Wei and Starks (2013)	19	USA	Manufacturing firms whose data are available in CRSP and Compustat	Exchange rate exposure, stock returns	Distance to default, O-score	Average exposure for a high probability of default is 0.5529 greater than low default probability in apparel industry. Out of 22 industries, 18 show high exposure to default probability
17	Molina and Preve (2012)	67	Compustat	85,27 firm-year observations from Compustat	Opportunity loss, operating profit loss	Dummy variable	11% decrease in sales and 21% decrease in profits
18	Davydenko, Strebulaev, and Zhao (2012)	78	USA	175 unique defaulting firm from Moody's DRD data	Market loss	Legal bankruptcy	21.7% loss of market value for all default; 41.4% loss of equity when liquidated and 23.1% loss when restructure
19	Farooq <i>et al.</i> (2012)	0	Pakistan	202 ongoing manufacturing firms	Opportunity loss	Dummy variable	Average opportunity loss of 2% for financially distressed while operating distress it is 1.2%
20	Gutierrez <i>et al.</i> (2012)	15	Germany, Spain, USA, France, UK	3,189 firms from which 130 were financially distressed	Operating profit loss	Z-score	Average Tobin's q 1.384 for distress, 1.512 for bankrupt and 1.826 for healthy
21	Bisogno and Luca (2012)	8	Italy	2,174 failed SMEs	Opportunity loss, investment opportunities, operating profit loss	Legal bankruptcy	88.85% less profits of bankrupt firms as compared to non-bankrupt
22	Benmelech and Bergman (2011)	146	USA	18,327 transactions from 12 different US airlines	Finance cost loss	Legal bankruptcy	Credit spread for bankrupt airlines is 531.7 while for non-bankrupt it is 276.1
23	Tshitangano (2011)	5	South Africa	399 firms out of which 94 were distressed	Opportunity loss	Dummy, Z-score	Opportunity loss of 16.7% of market value
24	Bhabra and Yao (2011)	11	USA	62 bankrupt firms	Opportunity loss	Legal bankruptcy, Z-score	Opportunity costs of approximately 2%, 6.2%, and 14.9% of firm value in years 3, 2 and 1
25	Davydenko and Rahaman (2011)	7	USA	371 firm that are bankrupt and having low Tobin's q	Operating profit loss, cost of flexibility	Legal bankruptcy	Earnings decrease by 8.7% of assets for three years late liquidation
26	Liu <i>et al.</i> (2010)	1	China	94 special treatment firms	Market loss, operating profit loss	Legal bankruptcy	5.4% of market value, 15.5% of profit margin loss
27	Zhang and Gan (2010)	3	China	66 special treatment firms	Market loss	Legal bankruptcy	Average 17.27% market value decrease during financial distress

(continued)

Number	Author and year	Citations	Country	Sample	CFD variable	Distress variable	Impact size
28	Reimund <i>et al.</i> (2009)	11	Germany	347 firms from Datastream	Opportunity loss, market loss, operating profit loss	Leverage	Opportunity loss of 28.6% of firm value
29	Molina and Preve (2009)	113	Compustat	60/202 firm-year observations	Opportunity loss, market loss, operating profit loss	Dummy variable	Sales decrease by 13% and stock return decrease by 20%
30	Frino <i>et al.</i> (2007)	22	Australia	78 failed firms from Huntley's Delisted Company and Fin-Analysis Databases	Market loss	Legal bankruptcy	Returns decline before the announcement by 26.5%
31	George and Hwang (2007)	30	USA	Monthly price data of all NYSE, AMEX and NASDAQ companies covered by CRSP	Market loss, operating profit loss	O-score, Z-score	CAR for high O-score with low leverage is -0.30, while for high O-score and high leverage it is -0.54
32	Wijantini (2007)	1	Indonesia	29 firms having interest coverage between 0 to 1	Opportunity loss, operating profit loss	Leverage	Profits are reduced by 7% with standard deviation of 14%. Sales are drop by 2% with standard deviation of 64%.
33	Pindado and Rodrigues (2005)	45	Germany, USA	186 German firms, 1,704 US firms, 491 UK firms	Opportunity loss	Pindado <i>et al.</i> (2008)	For US default probability has beta of 0.804 while for leverage it is -0.832 to explain opportunity losses
34	Bris <i>et al.</i> (2006)	16	USA	61 Chapter 7 and 26 Chapter 11 cases	Time	Legal bankruptcy	Both Chapters 7 and 11 took almost two years to resolve
35	Rose-Green and Dawkins (2002)	29	USA	226 financial bankruptcy and 19 strategic bankruptcy	Market loss	Legal bankruptcy, Z-score, O-score	One-day window CAR for financial bankruptcy is -0.04 while for strategic bankruptcy it is -23.07
36	Chen and Merville (1999)	38	USA	113 firm declining Z-score, 890 firm with unclear pattern and 38 firm increasing Z-score	Opportunity loss, investment opportunities	Z-score	The average loss of 10.3% of market value
37	Andrade and Kaplan (1998)	1,273	USA	31 high leverage transactions	Opportunity loss, investment opportunities	Legal bankruptcy	10% of firm value on average

(continued)

Table II.

Table II.

Number	Author and year	Citations	Country	Sample	CFD variable	Distress variable	Impact size
38	Kawai <i>et al.</i> (1996)	43	Japan	1,412 firms from which 334 were financially distressed	Finance cost loss	Dummy variable	Borrowing with main bank cause interest premium of 0.016 while without main bank it is 0.203
39	Kvansa and Cho (1995)	29	USA	10 bankrupt restaurants	Opportunity loss, operating profit loss	Subjective	Average opportunity loss is 7.72% of market value
40	Opler and Titman (1994)	1,394	USA	46,799 firm-years of data, 3% of which belong to distressed industries	Opportunity loss, market loss, operating profit loss	Leverage	Sales are 26.4% lower for high leverage firms as compared to low leverage firms
41	Bhagat <i>et al.</i> (1994)	242	USA	355 lawsuit filings and announcement	Market loss	Legal bankruptcy, O-score	At announcement combined equity value decrease by \$20.91m
42	John (1993)	303	USA	223 firms from the Fortune 500 companies in 1980	Costs of illiquidity	Legal bankruptcy	0.001 beta of bankruptcy with illiquidity
43	Opler and Titman (1993)	33	USA	63 leverage buyouts	Finance cost loss	Leverage	Innovative financing methods reduce indirect finance cost by 60 basis points
44	Hoshi <i>et al.</i> (1990)	1439	Japan	125 financially distressed firms	Opportunity loss, investment opportunities	Leverage	Investment rate of firms affiliated with group was 7.4% less than non-group firms
45	Gilson (1989)	1,233	USA	381 listed firms that show decline in their market value	Management loss	Legal bankruptcy	52% of sample firm faced senior managers turnover
46	Pham and Chow (1989)	16	Australia	14 failed firms	Opportunity loss, operating profit loss	Leverage	13.4%–18.7% of market value
47	Allman (1984)	1,432	USA	12 retailers and 7 other industrial units	Opportunity loss, operating profit loss	Legal bankruptcy	11%–17% up to three years before default

Notes: CFD, cost of financial distress; CDS, credit default spread

most influential studies of indirect costs, as their citations exceeded to 1,200 till June 2017. The fourth column represents the country of study while the next column explores the sample extracted for that country. However, some of the studies did not provide the information about the country of study and just mention database like Compustat from which data are extracted. For such studies, the database name is mentioned. The sixth column provides a view of the variable used to measure the indirect cost of financial distress. This variable is the main dependent variable of a particular study. Many of the studies used multiple proxies of indirect cost and mentioned accordingly.

The seventh column is the distress variable that is used to quantify its effect on the indirect cost. Most of the literature used distress variables in regression analysis or studied mean differences of indirect cost for two categories of distress and non-distress. Therefore, the distress variable is the main independent variable that distinguished between financially distressed and non-distressed firms. The last column presents the impact size of indirect cost. Some of the studies mentioned impact size specifically based on their descriptive analysis. Such impact size is presented as cited while for other studies impact size is subjectively extracted from descriptive statistics or betas of regression analysis. This impact size is the loss that distressed firms bear due to financial distress or bankruptcy. Subsequent part will discuss these results in detail.

3. Results and discussions

Results of SLR showed that most of the studies of indirect costs are conducted in developed countries especially in the USA. According to SLR results, 23 studies used data from the USA as shown in [Table III](#). Conversely, despite the fact that weak governance and dynamic environment in developing countries increase the importance of cost of financial distress, only eight studies explored the subject matter in developing countries like Malaysia, Indonesia and Pakistan. This indicates that the literature gap exists for the study of indirect cost in developing countries. Unavailability of default data can be one of the reasons of less research in developing countries ([Ugurlu and Aksoy, 2006](#)). However, with the development of data, one can anticipate more research on the subject matter in developing countries.

SLR results also showed that opportunity loss, operating profit loss, market loss, management loss, interest rate premium and loss of investment opportunities are most frequently used measurements of indirect cost as shown in [Table IV](#). [Table IV](#) provides the

Country	Orientation	Count of no.
USA	Developed	23
Compustat and other databases	Developed	4
Multiple developed	Developed	4
Australia	Developed	2
Japan	Developed	2
Germany	Developed	1
Hungary	Developed	1
Italy	Developed	1
Sweden	Developed	1
China	Developing	2
Indonesia	Developing	2
Pakistan	Developing	2
Malaysia	Developing	1
South Africa	Developing	1

Table III.
Countries of study in SLR

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Table IV.
Measurement of
indirect cost of
financial distress

Row labels	Count of no.
Opportunity loss	20
Operating profit loss	15
Market loss	14
Investment opportunities	5
Finance cost loss	4
Management loss	4
Time	2
Car price loss	1
Costs of illiquidity	1
Excessive cash holdings	1
Exchange rate exposure	1
Cost of flexibility	1
Creditors' loss	1

numbers of studies that used different proxies of indirect cost. SLR results revealed that many of the studies investigated multiple proxies of indirect cost. This is why the total numbers in [Table IV](#) are not equal to the total number of studies (47). [Table IV](#) is showing that opportunity loss is the most studied (20 times) indirect cost of financial distress. Literature measures opportunity loss as the difference between industry sales growth and the company sales growth. It is defined as available opportunistic market share (sales) that a company could not capture due to financial distress ([Opler and Titman, 1994](#)). [Opler and Titman \(1994\)](#) explain this opportunistic loss in term of customer driven or competitor driven losses.

The study of [Opler and Titman \(1994\)](#) is the most cited literature to explain the opportunity cost. They argued that in financial distress, customers' loyalty decrease and finally they abandon the firm especially when the product is more specialised. Similarly, competitors use aggressive marketing strategies to capture the market share of distressed firms especially with concentrated industries. Similarly, [Molina and Preve \(2009\)](#) explored that due to liquidity problems during financial distress, firms follow aggressive working capital strategies that decrease their sales revenue and cause opportunity cost. Thus, customer-driven or competitor-driven forces are major sources of opportunity cost.

Similarly, operating profit loss due to financial distress or bankruptcy is the second most studied measure of indirect cost as shown in [Table IV](#). This proxy is calculated as the difference between operating profit margins of the sector and operating profit margin of the company. In the literature, similar argument of sectoral behaviour is given to explain the reasons of operating profit loss. SLR also explores that the market loss is another most studied indirect cost of financial distress. Literature measures this market loss through stock returns or cumulative abnormal returns. It is argued that financial distress provides the negative signal to the market about firm's financial health. As a result, the market value of equity decreases can be attributed to market loss ([Davydenko et al., 2012](#)). However, this proxy of indirect cost is more related to the institutional environment, and its magnitude may differ for the data from different stock exchanges.

Similarly, firms forgo investment opportunities of positive net present value (NPV) projects during financial distress. In financial distress, firms face liquidity problems and may focus on increasing their cash rather than investing in positive NPV projects. Such opportunity losses are also attributed to the indirect cost of financial distress. The risk premium is another cost studied as an indirect loss. In financial distress, firms need funds to

respond to potential liquidity problems. However, when such funds are financed through debt, the high-interest premium is charged, which can be attributed to the indirect cost of financial distress (Hoshi *et al.*, 1990). Bhabra and Yao (2011) argued that operating profits are affected by financial distress with a series of follow-up events including augmented interest rate demand from creditors. Kawai *et al.* (1996) also argued that in financial distress, firms pay more risk premium. However, they argued that risk premium depends on the borrowings from the main bank. Benmelech and Bergman (2011) explored that when a firm is liquidated, other collateral value of similar liquidated assets decreases for other survived firms. As a result, bankruptcy affects the cost of financing for other participants operating in the same industry.

In financial distress, firms could also lose their competitive workforce or pay more wage premium attributed as management loss. Firms often follow the strategy of downsizing in financial distress (Baghai *et al.*, 2016). Baghai *et al.* (2016) also found that firms lower down their leverage when the chance of losing talent is high. Gilson (1989) also studied the employee turnover during financial distress. They found that 52 per cent of their sample firms fire their senior employees during financial distress. Berk *et al.* (2010) studied labour contracts for highly levered companies to estimate the cost of bankruptcy and optimal capital structure decisions. However, they argued that before bankruptcy, it is profitable if only unproductive employees are dismissed and pay contract wages. They also found that highly levered firms pay more to newly hired personals. Graham *et al.* (2015) also explored that firms pay wage premium due to financial distress, as employees bear the risk of layoff in future bankruptcy. Their results also revealed that this indirect cost is about half of tax advantages. Therefore, indirect management loss is significant.

Another important indirect cost is measured through time elapsed during bankruptcy proceedings or winding up. The excessive continuation of business or lengthy process of bankruptcy proceedings decreases the firm value and amount available for claim holders (Davydenko and Rahaman, 2011). Similarly, Hortaçsu *et al.* (2013) studied the decrease in car prices due to change in credit default spreads, Khieu and Pyles (2016) explored the effects of financial distress on excessive cash holdings and Wei and Starks (2013) investigated the elasticity of foreign exchange exposure due to financial distress. These negative hidden losses are attributed to the indirect cost of financial distress. In short, various proxies of indirect cost have been used in literature that show the diverse and complex nature of indirect cost.

3.1 Measurement of distress variable

Previous studies also used different proxies of financial distress to define their sample or quantifying its indirect effects as shown in Table V. It is found that most of the studies (21) used legal definition of default while studying the indirect cost of financial distress. These studies primarily focus on the US-based Chapter 7 and Chapter 11. SLR explores that 13 of 21 studies used data of US firms that file for Chapter 7 or Chapter 11. Most of these studies tried to explore the market loss and operating loss before the filing of Chapter 7 or Chapter 11. Eight of 21 legal bankruptcy studies explored market loss and found that market value decreases before the bankruptcy filing. Similarly, six studies focus on operating performance of firms before filing official bankruptcy or out of court debt restructuring.

However, legal bankruptcy is based on the *ex post* definition of distress, while the indirect cost also incurs for ongoing firms that do not bankrupt subsequently (Chen and Merville, 1999). The generalizability of studies focusing on *ex post* legal definition is questionable. The legal framework of each country differs, and application of US studies based on debtor-friendly Chapter 11 to other environment settings may provide spurious

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Table V.
Definition of default
used in literature

Default definition	Count no.
Legal bankruptcy	21
Z-score	9
Leverage	8
Dummy variable	6
O-score	5
Distance to default	3
Pindado et al. (2008)	2
CDS	1
Downgrade credit ratings	1
Logit model	1
Subjective	1

results. Therefore, some of the studies used *ex ante* proxy of financial distress. For instance, [Table V](#) explored that nine studies used Altman's Z-score and five studies deployed Ohlson's O-score to quantify the magnitude of financial distress. Another method of the dummy variable is followed by six different studies from SLR. These studies defined dummy variable based on the *ex ante* definition of distress such as consecutive three-year losses or interest coverage ratio less than 0.8. Similarly, some of the studies used leverage-based indicators to investigate the indirect cost. Some of these studies argued that high leverage firms perform less in economic distress as compared to low leverage firms ([Opler and Titman, 1994](#)). Such underperformance is due to financial distress rather than economic distress. However, [Pindado and Rodrigues \(2005\)](#) criticised such approach and argued that leverage may have positive effects and one should study the impact of leverage and the probability of financial distress independently.

[Pindado and Rodrigues \(2005\)](#) criticised the selection of leverage as a proxy of financial distress. They argued that leverage and other relevant probability of financial distress should be used separately to evaluate the indirect cost of financial distress. Their argument was based on positive effects of leverage as proposed by [Jensen \(1986\)](#). Therefore, future studies should consider the benefits of leverage and use relevant proxy of financial distress. However, it is further suggested that leverage does not contain a linear relation with indirect cost. If it is assumed that leverage can have positive effects, then such progressive performances may not linear. Leverage may have a positive relation, but to a specific level of debt and after that level its effect may become more adverse. Therefore, future studies should use the probability of financial distress with non-linear proxy of leverage to estimate indirect cost.

However, no study tried to estimate indirect cost during multiple events of financial distress. In literature, some of the studies believe that financial distress is not a one-time event and consists of multiple heterogeneous events that take a firm closer to bankruptcy. For instance, [Turetsky and McEwen \(2001\)](#) explored a three-stage process of financial distress that starts from dividend reduction and go through default debt to troubled debt restructuring. Similarly, [Tsai \(2013\)](#) studied three categories of no distress, slight distress and reorganisation or default. These proposed stages show the different level of adversity of financial distress. Therefore, the intensity of various indirect losses may differ within adversity-based stages of financial distress. For instance, in the early stages of financial distress, risk premium loss might not be critical as in the later stage of severe liquidity problems. Future studies are recommended to investigate indirect cost using multi-stage *ex ante* proxies of financial distress.

3.2 Determinants of cost of financial distress

SLR results also revealed that some of the studies explored the determinants of the cost of financial distress. These studies are segregated into three groups. The first type of studies investigated the effects of financial distress on some proxy of indirect cost and used other control variables. Some of these studies attributed control variables as determinants of indirect cost (Farooq *et al.*, 2012; Javaria *et al.*, 2013; Kristanti, 2015; Pindado and Rodrigues, 2005). However, the effect of control variables on the proxy of indirect cost cannot be attributed to the indirect cost of financial distress. For instance, Pindado and Rodrigues (2005) use opportunity losses as a proxy of financial distress. Such opportunity loss can only be labelled as the cost of financial distress if firm forgoes the opportunity due to financial distress specifically. Pindado and Rodrigues (2005) included probability of financial distress and other control variables such as liquid assets in their regression model to predict the opportunity loss. However, the impact of control variables like liquid assets on opportunity loss cannot be labelled as the indirect cost of financial distress. It is because the change in liquid assets might not be due to financial distress.

The second type of studies deployed sample of only distressed firms and investigated the impact of different variables on some proxy of indirect cost. SLR results explored six studies of this category presented in Table VI along with variables used in the respective research. Italic variables are showing their insignificant impact on the indirect cost. These variables can be labelled as determinants of indirect cost. It is because the sample of these studies consists of only bankrupt or financially distressed firms. For instance, study no. 1 of SLR by Bulot *et al.* (2017) used opportunity loss as a proxy of financial distress for 190 financially distressed firms. Since the impact of all selected independent variables will explain the variations in opportunity cost during the period of financial distress so the independent variables can be called as determinants of the indirect cost of financial distress.

The third type of studies investigates the determinants using moderation technique. These studies used a sample of both financially distressed and non-distressed firms. However, cross effects of dummy variable of financial distress and some determinant of indirect cost is used in their regression analysis. Cross effect explores the impact of financial distress on indirect cost within the contingency of specified variable. SLR results showed that there are 13 studies that used some variable and its cross effects with financial distress to predict variations in indirect cost as shown in Table VII. The fourth column of the

No.	Author and year	Indirect cost	Determinants of indirect cost
1	Bulot <i>et al.</i> (2017)	Opportunity loss	Intangible assets, investment opportunities, size, <i>expected earnings growth, liquid assets</i>
24	Bhabra and Yao (2011)	Opportunity loss	Herfindahl index, leverage, size, <i>EBIT, interest coverage ratio</i>
27	Zhang and Gan (2010)	Market loss	State ownership, Tobin's q, <i>ownership balancing, ownership concentration, debt to assets, intangible assets, size</i>
32	Wijantini (2007)	Opportunity loss, operating profit loss	Political connection, complexity, <i>bank loan, leverage, size</i>
35	Rose-Green and Dawkins (2002)	Market loss	Strategic bankruptcy, size, Z-score, market value of equity
44	Hoshi <i>et al.</i> (1990)	Opportunity loss, investment opportunities	Group affiliation, debt to capital ratio, fraction of loan from largest lender, industry investment and sales, <i>coverage ratio, share owned by largest lender</i>

Note: Italics are variables that showed their insignificant relation with cost of financial distress in their respective studies

Table VI.
Determinants of indirect cost using default sample only

Table VII.
Determinants of
indirect cost using
moderation
technique

Serial no.	Author and Year	Moderation type	Indirect cost	Distress variable	Moderating variable
4	Campello <i>et al.</i> (2016)	Single moderation	CDS spread	Highly distress based on Z-score	Post tax, syndicated loan
5	Baghai <i>et al.</i> (2016)	Single moderation	Leave rate	Close to bankruptcy (3 years)	Talent, age, exp in company, exp in industry, years of education
6	Sautner and Vladimirov (2016)	Single moderation	Abnormal return	Distance to default probability	Post reforms in the USA, Germany dummy comparative to the USA
10	Ertan and Karolyi (2014)	Single moderation	Abnormal returns	Logit model	Debt covenants
11	Gill (2014)	Single moderation	Wage premium	Leverage	Layoff risk, employee risk aversion, employee entrenchment
13	Hortaçsu <i>et al.</i> (2013)	Single moderation	Car prices at auction	CDS	Life of car, warranty status, millage, physical condition
20	Gutierrez <i>et al.</i> (2012)	Single moderation	Tobin's q	Z-score dummy and bankruptcy filing	Index for creditor right
36	Chen and Merville (1999)	Single moderation	Opportunity loss, investment loss	Dummy of financial distress	Size, debt to equity, market to book
40	Opler and Titman (1994)	Single moderation	Opportunity loss, market loss	Leverage	R&D, size, industry concentration
3	Khieu and Pyles (2016)	Two-way moderation	Market to book value	Downgrade credit ratings	Excess cash
16	Wei and Starks (2013)	Two-way moderation	Abnormal returns	Distance to default and O-score	Exchange rate exposure
17	Molina and Preve (2012)	Two-way moderation	Opportunity loss, operating profit	Dummy variable	Payables, market power, unique product, size
29	Molina and Preve (2009)	Two-way moderation	Opportunity loss, operating profit	Dummy variable	Receivables, market power

Table VII is showing particular proxy of indirect cost while the fifth column is about the variable of distress. The last column provides the list of moderating variables that is used as its cross effect with distress proxy from column four. List of all moderating variables from the last column can be attributed as determinants of indirect cost. It is because these contingency variables affect the intensity of indirect cost of financial distress.

However, this moderating technique is applied by two different methods. Most of the studies used cross effects in a single regression model. For instance, study no. 4 by [Campello et al. \(2016\)](#) explored the effects of high distress on credit default spread while moderating tax reforms and syndicated loan in a single regression model. The results of the cross effect of high distress and post-tax showed negative beta indicating that financing cost reduced after tax reforms as compared to pre-reforms era. Similarly, Study no. 5 by [Baghai et al. \(2016\)](#) showed that leave rate increases for firms having competitive workforce closer to bankruptcy as compared to earlier to bankruptcy. However, SLR results explored four studies that do not use a single regression model to moderate the determinant of indirect cost. These studies are presented in the last part of [Table VII](#). These studies used two regression models separately.

In the first stage, regression model is executed to explore the effects of distress on moderating variable. In the second stage, the effects of distress and its cross effect with moderating variable are used to explain the variations in indirect cost. For instance, Study no. 3 by [Khieu and Pyles \(2016\)](#) explored the positive effect of downgrade credit rating on excess cash flows. In the second stage, the cross effect of financial distress and excess cash flows is used to estimate the market value. Similarly, Study no. 16 by [Wei and Starks \(2013\)](#) found that distance to default positively change the exchange rate exposure that ultimately affects the abnormal returns. This two-stage method helps to explain how a particular determinant could influence the intensity of indirect cost of financial distress.

Future studies should pay particular consideration on the methods while studying determinants of indirect cost. It is suggested that the moderating technique is more useful as compared to first two discussed methods. It is because rather than absolute impact, moderation explains the effect of particular determinant during financial distress as compared to non-distress period.

4. Conclusion

Literature shows that indirect cost is more intense as compared to direct cost of bankruptcy. Various studies have estimated indirect cost using different measurements, distress variables and contextual variables, which makes the construct more complex. It is argued that an SLR is needed to understand the scope and nature of varied view of indirect costs. This research applied a five-step SLR to understand the scope, measurement, impact size and determinants of indirect costs. SLR process explored 47 relevant studies after applying specified criteria. Data regarding sample size, proxy of indirect cost, proxy of distress variable, impact size and determinants of indirect cost are provided in different tables.

SLR results showed that most of the early literature of indirect cost focus on developed countries, especially the USA. However, literature gap exists to study the indirect cost in developing countries. Results also showed that opportunity loss, operating profit loss, management loss, market loss and risk premium are most studied proxies of indirect cost. Furthermore, it is revealed that literature either used *ex post* legal bankruptcy or some *ex ante* proxy of financial distress like Z-score and O-score to determine their impact on indirect cost. However, future studies are recommended to use *ex ante* proxy of financial distress with non-linear leverage. It is because literature also believe in the positive aspects of leverage, and using debt as proxy of indirect cost is not appropriate.

It is also found that many of the studies investigated determinants of indirect cost. However, these studies either used sample of bankrupt firms or combination of both bankrupt and non-bankrupt firms. Firms that use combination sample used moderation technique to study the determinants of indirect cost. Future studies exploring determinants of indirect cost are recommended to use this moderation technique, as it will explore the comparative impact for financially distressed firms as compared to non-distressed firms.

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