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## Article

# Efficiently monitoring the ship of financially distressed companies sinking in Iron law of earnings management: Evidence from Pakistan

Cogent Economics & Finance

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*Suggested Citation:* Khalid, Muqaddas; Abbas, Qaisar; Nazir, Mian Sajid (2020) : Efficiently monitoring the ship of financially distressed companies sinking in Iron law of earnings management: Evidence from Pakistan, Cogent Economics & Finance, ISSN 2332-2039, Taylor & Francis, Abingdon, Vol. 8, Iss. 1, pp. 1-15,  
<https://doi.org/10.1080/23322039.2020.1838685>

This Version is available at:

<https://hdl.handle.net/10419/269997>

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To cite this article: Muqaddas Khalid, Qaisar Abbas & Mian Sajid Nazir | (2020) Efficiently monitoring the ship of financially distressed companies sinking in Iron law of earnings management: Evidence from Pakistan, Cogent Economics & Finance, 8:1, 1838685, DOI: [10.1080/23322039.2020.1838685](https://doi.org/10.1080/23322039.2020.1838685)

To link to this article: <https://doi.org/10.1080/23322039.2020.1838685>



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Received: 20 February 2020  
Accepted: 09 October 2020

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Reviewing editor:  
David McMillan, University of Stirling, United Kingdom

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## FINANCIAL ECONOMICS | RESEARCH ARTICLE

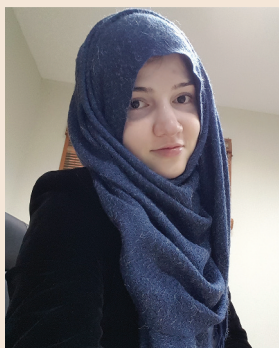
# Efficiently monitoring the ship of financially distressed companies sinking in Iron law of earnings management: Evidence from Pakistan

Muqaddas Khalid<sup>1\*</sup>, Qaisar Abbas<sup>2</sup> and Mian Sajid Nazir<sup>1,3</sup>

**Abstract:** The purpose of this study is to validate the relationship between earnings management and financial distress. Further, it will explore the moderating role of ownership structure for the relationship between earnings management and financial distress which is missing in the current literature. Agency theory and the iron law of earnings management are utilized to develop the framework for this study. Data have been collected from 156 companies listed on the Pakistan Stock Exchange for the period of 2004 to 2017. All the reported results are on a log-odds matrix because our dependent variable is binary. The results of the study proved that there exists a positive relationship between earnings management and financial distress and this relationship is negatively moderated by ownership structure. The results of this study are beneficial for investors as well as regulators regarding control mechanisms of ownership structure.

**Subjects:** Finance; Business, Management and Accounting; Industry & Industrial Studies

**Keywords:** Earnings management; financially distressed companies; financially healthy companies; ownership structure; agency theory; iron law; logit analysis; moderation; entrenchment behavior; efficient monitoring



Muqaddas Khalid

### ABOUT THE AUTHOR

Muqaddas Khalid is a Ph.D. scholar in Department of Management Sciences, COMSATS University Islamabad, Lahore Campus, Punjab 54000, Pakistan. She has completed her MS in 2013. She is the author of several publications in well-reputed journals and has presented her work in several national and international conferences. Her area of interest is corporate governance, corporate finance, earnings management and financial distress. Currently, she is carrying out her research on different aspects of corporate finance that can affect financial distress status of a company.

### PUBLIC INTEREST STATEMENT

Each investor wants to know the detailed financial conditions of companies before choosing to invest in them. And if it is about investing in financially distressed companies, it requires more insights and financial analysis of such firms. In this way, they can avoid the myopic investments thus safeguarding their profits from plummeting because of the wrong choice of company. However, companies may get involved in window dressing their earnings, i.e., earnings management, to attract investments and also to avoid financial distress. The present study has well explained that companies engaging in earnings management to avoid the state of financial distress, however, ultimately are faced with increased financial distress. Conversely, a strong ownership structure in financially distressed companies can control their earnings management activities. The present study demonstrates that investors can analyze a financially distressed firm regarding its earnings and ownership structure before investing in it.

## 1. Introduction

Financial distress (FD) has long been debated for corporations. Financial performance can be exacerbated due to FD where bankruptcy and acquisition by other firms can prove as the extreme outcome of financial distress. Whenever a company is facing difficulty in continuing its business operations, it is assumed to be in the situation of financial distress (T.-H. Yang et al., 2016). Initially, FD was specified “bankruptcy, non-remittance of preferred dividends and debts” (Beaver, 1966). FD upturns the fixed costs, negative earnings, or illiquid assets for over an extended time period.

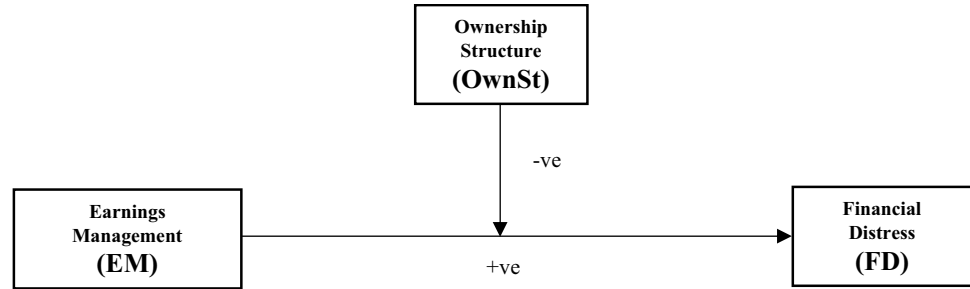
To disguise weak performance, low performing financially distressed firms may participate in upward earnings management (EM) (Kim et al., 2014). To substitute the firms’ financial performance, managers are motivated to misrepresent accounting information because of the pressure instigated by poor results or risky financial situations (Campa & Camacho-Miñano, 2014). These risky financial situations are thus covered up by managers. It is more probable that they will be engaged in inappropriate recognition of revenue and deviously control of liabilities, expenses, and accounts receivable (Center, D. F., 2008) to avoid the display of declining performance. Several studies show the expectation that financially distressed companies will be tangled in the manipulation of financial statements, i.e., earnings management (Du et al., 2017; Lenard & Alam, 2009; Persons, 1995). Earnings management, which was done by increasing the earnings to report the declining performance of the company as high (Fung & Goodwin, 2013; Ghazali et al., 2015; Habib et al., 2013; Jiang et al., 2018) will ultimately be reversed according to “iron law” of earnings management (Scott, 1997). Thus, it can be comprehended that earnings management may bring positive results for the deteriorating company for a short period of time, but it cannot ensure long-term results.

In this article, we expect the ownership structure to negatively moderate the relationship between EM and FD. Our argument is built on the following premise: First, agency issues arise because of the consideration of ownership and control as separated, i.e., conflict of interest between managers and owners (Type I agency issues) or because of expropriation of minority shareholders by the majority shareholders (Type II agency issues). Agency theory (AT) posits that both types of agency issues can be eradicated through proper control mechanisms regarding the ownership structure of firms. Second, by combining both agency theory (AT) (Jensen & Meckling, 1979) and iron law of earnings management (Scott, 1997), we can postulate that if there are proper control mechanisms regarding ownership structure being followed in the firms, the impact of earnings management on financial distress might be diminished.

This article extends the current literature in two distinctive ways. First, from a wide range of research studies discussed in the literature section, it is evident that although there are studies which have seen the association between ownership structure & financial distress (Abdullah, 2006; Elloumi & Gueyié, 2001; Khalid et al., 2018; Khalid & Waheed, 2013; Udin et al., 2017), there is no study that has studied the impact of earnings management on financial distress with moderation effect of ownership structure to date that how much the presence of this ownership structure influence the established relationship between earnings management and financial distress. Therefore, in the spirit of studies that have inspected the influence of the link between earnings management and financial distress (Fung & Goodwin, 2013; Ghazali et al., 2015; Habib et al., 2013; Jiang et al., 2018), we will investigate the moderating influence of ownership structure on the link amid EM and FD.

Second, the impact of earnings management on financial distress has become of great interest for investors, practitioners, shareholders, and regulators. However, there are very few studies that have examined the practices of earnings management in financially distressed companies (Fung & Goodwin, 2013; Ghazali et al., 2015; Habib et al., 2013; Jiang et al., 2018; Kim et al., 2014). Given that, no study has studied particularly the impact of earnings management on financial distress. The present study is thus filling this gap by attempting to validate the relationship between earnings management and financial distress by seeing the impact of EM on FD in the non-financial sector. The following model in Figure 1 is therefore proposed for this article,

Figure 1. Proposed model.



The present study intentions

- (i) To find the influence of Earnings Management (EM) on Financial Distress (FD).
- (ii) To find the moderating role of Ownership Structure (OwnSt) on the link amid Earnings Management (EM) and Financial Distress (FD).

The rest of the article is structured as follows: the second section presents the literature review and hypothesis development while the third section is about research design. The fourth section exhibits the results and discussion and section five is about the conclusion.

## 2. Literature review and hypothesis development

### 2.1. Financial Distress (FD)

The failure to cope up with the financial liability of the business is endorsed as “Financial Distress” which refers to the difficulty in the survival of the firm with its external financial obligations. All stakeholders of a firm can be thumped as a consequence of this financial distress leading them towards the major loss. It can be harmful to the employees because they may suffer the bonuses-cut offs and reputation damage (Gilson, 1989; Liberty & Zimmerman, 1986). The seminal definition of financial distress was defined as “bankruptcy, non-remittal of preferred dividends and debts” (Beaver, 1966). It is also defined as a situation when a firm faces difficulty to meet creditors’ obligations or not meet at all (Arnold, 2008). The ultimate result of the firms suffering from financial distress can be bankruptcy which can result in a significant financial loss. However, financial distress doesn’t need to lead to corporate bankruptcy. The financially distressed companies which have not yet touched the point of bankruptcy and are still listed on the Pakistan Stock Exchange (PSX) will be taken for analysis purpose of this study.

### 2.2. Earnings Management (EM) and Financial Distress (FD)

The importance of financial reports and earnings cannot be denied as they have always been vital for managerial decision-makers for future planning and forecasting (DeGeorge et al., 1999). Although other financial performance indicators such as cash flows, dividends, and financial leverage are critical for decision-makers, earnings are specifically believed to be utilized as a better performance indicator for future planning. Therefore, managers aim to enhance organizations’ earnings by engaging in earning management activities. Whereas managers focus on and use earnings management as a tool to decide current and future period performances. Also, firms often control their accounting policies to mask their poor performance and display a better performance picture. Managers of distressed firms often manipulate their earnings more to portray a better image and manage short-term cash flow by managing accounts receivable or inventory (DeAngelo et al., 1994).

Earlier researchers also report that companies facing financial distress situations are projected to do earnings management for contractual debates and camouflaging FD (Burgstahler & Dichev, 1997; DeAngelo et al., 1994). Firms’ creditors and other stakeholders are likely to suffer more if a firm is facing distress conditions and it could even have a bad influence on the overall

society. A study claimed that earnings are more expected to be manipulated by the managers of distressed firms to portray a positive image as compared to financially strong counterparts (Habib et al., 2013). Because portraying a positive image can help managers to secure debts and avoid the questions raised by the firm's management (DeAngelo et al., 1994). Thus, we can say that more earnings management activities are seen in the financially distressed firms in comparison to financially healthy firms. Therefore, we may expect that

**Hypothesis 1:** *The extent of earnings management is positively associated with the extent of financial distress.*

### **2.3. Earnings management, financial distress, and ownership structure**

The second aspect to be referred to in this article is the impact of earnings management on financial distress triggered by ownership structure. The ownership structure, in this study, is an index of 14 parameters of firm ownership structure (adopted from (Nazir, 2016)). Regarding control mechanisms of ownership in firms, this article has focused on the “convergence-of-interest/alignment-of-interest hypothesis”, “entrenchment hypothesis” and “efficient-monitoring hypothesis”. “Alignment-of-interest hypothesis” makes managers perform in the best interest of the company. However, on the other hand, agency theory also postulates that managers and owners interests’ conflict with each other, and therefore the managers who own a part in the firm equity could know their precise objectives and benefits (*entrenchment hypothesis*). Lastly, the “efficient-monitoring hypothesis” postulates that agency issues are likely to be resolved if institutional investors own a big chunk of the ownership in the companies.

Per the premises of Agency Theory, it is explained that during the crisis the clash of interests between management and other stakeholders is more serious as agents will go for a short-run plan that gives them greater private paybacks to prevent their job loss (Donker et al., 2009). These short-term strategies are earnings management strategies. However, these strategies have seen to be declined in the presence of managerial ownership (Ali et al., 2008; Alves, 2012; Dhaliwal et al., 1982; Ebrahim, 2007; González & García-Meca, 2014; Piosik & Genge, 2019; Warfield et al., 1995), thus conforming to the *alignment-of-interest hypothesis*. This inside ownership (directors owning shares) also reduces the probability of a firm going into financial distress (Abdullah, 2006; Elloumi & Gueyié, 2001). The *entrenchment hypothesis*, on the other hand, states that as the managers hold more and more ownership (managerial ownership/inside ownership), it can lead them to their opportunistic behavior (Fama & Jensen, 1983) and engage more and more in earnings management (Beneish & Vargus, 2002; Cheng & Warfield, 2005; Healy, 1985; Holthausen et al., 1995; Perry & Williams, 1994). If we have a look at the literature of financial distress, it has been evident in previous researches that managerial ownership in a firm increases its chances of getting warning signals of financial distress (Wei et al., 2017).

Ownership structure, when measured through ownership concentration, decreased the earnings management practices of managers (Alves, 2012; Saona & Muro, 2018), thus supporting the *efficient-monitoring hypothesis*. The *efficient-monitoring hypothesis* suggests that large shareholders restrict managers’ opportunistic behavior. On the other hand, in the literature of ownership structure, there are also studies which have shown that earnings are more probable to be misrepresented/increased in the presence of ownership concentration (Chin et al., 2009; Dempsey et al., 1993; Francis et al., 2009; González & García-Meca, 2014; Hamid et al., 2014; Shuto & Iwasaki, 2014; Waweru & Riro, 2013; J. Yang et al., 2012) which does not support the *efficient-monitoring hypothesis* and support the opportunistic behavior (*entrenchment hypothesis*) of employees.

If we look at the literature of foreign ownership, it has been seen that foreign investors assist the firms in reducing agency issues (Douma et al., 2006) and the magnitude of earnings management is also decreased if the firm has a large proportion of foreign ownership (Guo et al., 2015). A study



found that financial distress in Pakistani firms is significantly negatively associated with foreign ownership (Udin et al., 2017), thus supporting the *efficient-monitoring* hypothesis. In the Pakistani context, however, foreign ownership is not very common because the number of foreign firms operating in Pakistan is very small (Shaikh et al., 2019).

Along the preceding literature discussed, we argue that when financial distress in the firms is decreased with strong ownership structure, the positive effect of EM on FD should be diminished significantly, hence saving a company from going into complete failure by causing bankruptcy. Hence, our second hypothesis goes as

**Hypothesis 2:** *Ownership structure will negatively moderate the relationship between earnings management and financial distress; the greater the level of ownership structure, the lesser the positive effect of earnings management on financial distress.*

### 3. Research design

The drive of the current study is to validate the influence of EM on FD, to investigate the moderating role of ownership structure on the relationship between Earnings Management (EM) and Financial Distress (FD). The methodology will be comprised of two steps. Firstly, the influence of EM on FD will be validated by using logit regression. Secondly, the effect of ownership structure as a moderating variable between EM and FD will be explored.

#### 3.1. Population and sample

The population nominated for the present study is non-financial. Among non-financial companies, only those companies have been selected which fulfill the criteria of the definition of financial distress. The present study will collect data from annual reports of PSX, published financial statements, websites of companies, annual reports of companies, and “Financial statements analysis (FSA) of Companies listed at Pakistan Stock Exchange (2004–2017)”. Timespan for the whole analysis consists of 14-year period of 2004–2017. The year 2004 is excluded in the analysis of this study as this year has been treated as the lag year for variables measurement and calculation. The sample selection procedure is given in the following table. The total population, i.e., total non-financial firms listed on PSX on 31 December 2017 was 287. Among these firms, initially, 170 firms were selected; however, firms whose financial and corporate governance information was not available for the study time period (2004–2017) were 14 and these were excluded from 170 firms. Finally, a sample of 156 financially distressed and healthy companies was selected for this study.

#### 3.2. Variables measurement and computations

##### 3.2.1. Financial Distress (FD)

Table 1 illustrates study variables measurement. The dependent variable for the present study is Financial distress (FD). If the firms fulfill any one of the following conditions, the firm will be categorized as financially distressed (Habib et al., 2013; Hopwood et al., 1994; McKeown et al., 1991; Mutchler et al., 1997). Firms not fulfilling the following criteria are categorized as non-distressed. FD is a dummy variable coded 1 if it fulfills any of the following three conditions.

- (a) “if the net income for the current year is negative” or
- (b) “if the working capital for the current year is negative” or
- (c) “if both the net income and working capital for the current year are negative”

Firms not fulfilling the above criteria will be categorized as a non-distressed firm, hence coded 0. Based on these criteria, among total observations of 2028, 976 observations were identified as distressed observations while the rest of the 1052 observations were recognized as financially non-distressed observations.

**Table 1. Variables description**

Variable name	Symbol	Definition	Expected relationship
<b>Dependent variable:</b>			
Financial distress	FD	FD is a dummy variable coded 1 if it fulfills any of the following three conditions. <ul style="list-style-type: none"> <li>• “if the net income for the current year is negative” or</li> <li>• “if the working capital for the current year is negative” or</li> <li>• “if both the net income and working capital for current year are negative”</li> </ul> Firms not fulfilling the above criteria will be categorized as non-distressed firm, hence coded 0.	
<b>Independent variable:</b>			
Earnings management	EM	Discretionary Earnings Management for firm <i>i</i> in time <i>t</i> estimated as residual of (Kasznik, 1999) model	Positive (+)
<b>Moderator:</b>			
Ownership structure	OwnSt	An index consisting of 14 indicators of ownership. The highest score will therefore be 14 with 0 lowest score. Higher value indicates strong ownership structure whereas lower value indicates weak ownership structure. Definition and scoring criteria of the ownership structure indicators is attached in appendix A.	Negative (-)
<b>Control variables:</b>			
Profitability	ROE	Net income divided by shareholders' equity.	Negative (-)
Firm size	Sze	Natural log of book value of total assets (adopted from).	Positive (+)
Leverage	Lvg	Long term debts divided by total assets (LTD / TA).	Positive (+)
Liquidity	Lqdt	Quick assets divided by Current liabilities (QA / CL). QA = Cash + Bank + Marketable securities	Negative (-)

### 3.2.2. Earnings Management (EM)

The second variable of interest in the present article is earnings management (EM). Discretionary accruals are a common measure for identifying EM in a company; hence, DEM (Discretionary Earnings Management) is used in this study as a measure of earnings management. Two approaches to identifying earnings management by using accruals, AEM, are the “balance sheet approach” and the “cash flow approach” (Ali Shah et al., 2009). A study (Collins & Hribar, 2000), however, contended that it is superior to utilize the “cash flow approach” than the “balance sheet approach” as the latter has been proved to be deficient in most cases and is also tender to the economic conditions of a country. This study, has, therefore, employed the “cash flow approach” as recommended by (Collins & Hribar, 2000) to measure total accruals (TA).

$$TA_{it} = EAT_{it} - OCF_{it}$$

Where:

$TA_{it}$  = Total Accruals of “*i*” firm for “*t*” time

$EAT_{it}$  = Earnings after tax of “*i*” firm for “*t*” time

$OCF_{it}$  = Operating Cash flows “*i*” firm for “*t*” time



In the Pakistani context, a researcher employed six models of EM in his dissertation (Nazir, 2016) (Dechow et al., 1996; Jones, 1991; Kasznik, 1999; Kothari et al., 2005; Larcker & Richardson, 2004; Yoon & Miller, 2002) and found that (Kasznik, 1999) has the highest explanatory power. Therefore, this study is following (Nazir, 2016) to estimate the discretionary portion (DEM) of earnings management by using the (Kasznik, 1999) model.

$$TA_{it} = \gamma_0 \left( \frac{1}{A_{it-1}} \right) + \gamma_1 \left( \frac{(\Delta REV_{it} - \Delta RCV_{it})}{A_{it-1}} \right) + \gamma_2 \left( \frac{PPE_{it}}{A_{it-1}} \right) + \gamma_3 \left( \frac{\Delta OCF_{it}}{A_{it-1}} \right) + \varepsilon_{it}$$

Where:

$A_{it-1}$  = Total assets in year t-1 of firm i for time t-1

$\Delta REV_{it}$  = Change in revenues from year t -1 to year t

$\Delta RCV_{it}$  = Change in receivables from previous year 't -1' to current year "t"

$PPE_{it}$  = gross property, plant and equipment of "i" firm for "t" time

$\Delta OCF_{it}$  = change in operating cash flows from previous year 't -1' to current year "t"

$\varepsilon_{it}$  = residual

### 3.2.3. Ownership Structure (OwnSt)

The third main variable of this article is OwnSt (ownership structure). It is an index of 14 indicators. This index is adopted from (Nazir, 2016). He has presented an index of corporate governance in his study called Corporate Governance Index (CGI) consisting of 29 indicators (variables) of corporate governance. The CGI has four categories, namely board structure, audit structure, compensation structure, and ownership structure. From among these structures, this article has taken ownership structure which consists of 14 indicators of ownership. The highest score will therefore be 14 with 0 lowest score. A higher value indicates a strong ownership structure whereas a lower value indicates a weak ownership structure. The definition and scoring criteria of the ownership structure indicators are attached in appendix.

## 4. The models

### 4.1. Model 1: earnings management and financial distress

$$(FD_{it} = 1) = \alpha_0 + \beta_1 (DEM)_{it} + \beta_2 (ROE)_{it} + \beta_3 (Sze)_{it} + \beta_4 (Lvg)_{it} + \beta_5 (Lqdy)_{it} + \varepsilon_{it}$$

where  $FD_{it}$  = Distress status of the  $i^{th}$  company (1 will be given to financially distressed, zero otherwise) in "t" time period;

$DEM_{it}$  = Discretionary Earnings Management of firm "i" for time period "t" estimated as residual of Kasznik (1999) model;

$ROE_{it}$ ,  $Sze_{it}$ ,  $Lvg_{it}$ ,  $Lqdy_{it}$  are the control variables employed in present study of firm "i" for time period "t";

$\varepsilon_{it}$  = Error term

### 4.2. Model 2: earnings management, ownership structure and financial distress

$$(FD_{it} = 1) = \alpha_0 + \beta_1 (DEM)_{it} + \beta_2 (OwnSt)_{it} + \beta_3 (ROE)_{it} + \beta_4 (Sze)_{it} + \beta_5 (Lvg)_{it} + \beta_6 (Lqdy)_{it} + \varepsilon_{it}$$

where  $FD_{it}$  = Distress status of the  $i^{th}$  company (1 will be given to financially distressed, zero otherwise) in “t” time period;

$DEM_{it}$  = Discretionary Earnings Management of firm “i” for time period “t” estimated as residual of Kasznik (1999) model;

$OwnSt_{it}$  = Ownership structure of firm i for time period “t”;

$ROE_{it}$ ,  $Sze_{it}$ ,  $Lvg_{it}$ ,  $Lqdy_{it}$  are the control variables employed in present study of firm “i” for time period “t”;

$\varepsilon_{it}$  = Error term

#### **4.3. Model 3: ownership structure as moderator between earnings management and financial distress**

$$(FD_{it} = 1) = \alpha_0 + \beta_1(DEM)_{it} + \beta_2(OwnSt)_{it} + \beta_3(DEM)_{it}(OwnSt)_{it} + \beta_4(ROE)_{it} + \beta_5(Sze)_{it} + \beta_6(Lvg)_{it} + \beta_7(Lqdy)_{it} + \varepsilon_{it}$$

where  $FD_{it}$  = Distress status of the  $i^{th}$  company (1 will be given to financially distressed, zero otherwise) in “t” time period;

$DEM_{it}$  = Discretionary Earnings Management of firm “i” for time period “t” estimated as residual of Kasznik (1999) model;

$OwnSt_{it}$  = Ownership structure of firm “i” for time period “t”;

$(DEM)_{it}(OwnSt)_{it}$  = interaction term used to see the moderation effect of ownership structure of firm “i” for time period “t”;

$ROE_{it}$ ,  $Sze_{it}$ ,  $Lvg_{it}$ ,  $Lqdy_{it}$  are the control variables employed in present study of firm “i” for time period “t”;

$\varepsilon_{it}$  = Error term

## **5. Results and discussion**

### **5.1. Descriptive analysis of financially distressed and non-distressed firms**

Table 2 presents the descriptive analysis and test of difference in means of financially distressed and financially non-distressed firms. The mean values of EM for financially distressed firms are -0.170 and for financially non-distressed firms is -0.519 and this difference is statistically significant at a 1% level. The mean values indicate that EM in both the distressed and non-distressed companies is income decreasing. The mean of ownership structure (OwnSt) is 0.471 for distressed and 0.604 for non-distressed and this difference is significant at a 1% level. It means that ownership structure is relatively strong in non-distressed firms as compared to distressed firms. On average, profitability (ROE) is low in financially distressed companies (0.095) as compared to financially non-distressed companies (0.203). The mean difference in the profitability of both samples is statistically significant at 1% level. The mean values of firm size (Sze) show that there is not much difference in both financially distressed (15.458) and non-distressed companies (15.351) based on firm size. On average, leverage (Lvg) is high in financially distressed firms (0.139) when compared with the non-financially distressed firms, and this difference is statistically significant at 1% level. Liquidity (Lqdy), on average, is low in financially distressed companies (0.540) as compared to financially non-distressed companies (1.204). Their mean difference is significant at 1% level.

**Table 2. Descriptive statistics and test of difference in means of financially distressed and non-distressed companies**

	Descriptive statistics		Test of difference in means
	Mean		Mean difference (t-test)
	FD = 1	FD = 0	
EM	-0.170	-0.519	-0.349 ** (0.000)
OwnSt	0.471	0.604	0.132 ** (0.000)
ROE	0.095	0.203	0.108 ** (0.000)
Sze	15.458	15.351	-0.107 (0.154)
Lvg	0.139	0.069	-0.070 ** (0.000)
Lqdy	0.540	1.204	0.663 ** (0.000)

\* significant at 5% level of significance

\*\* significant at 1% level of significance

**Table 3. Correlation matrix**

	EM	OwnSt	ROE	Sze	Lvg	Lqdy
EM	1					
OwnSt	-0.115**	1				
ROE	-0.038	0.075**	1			
Sze	-0.036	0.018	0.108**	1		
Lvg	0.047*	-0.080**	-0.049*	-0.038	1	
Lqdy	0.020	.044*	0.011	0.034	-0.109**	1

\* significant at 5% level of significance.

\*\* significant at 1% level of significance.

### 5.2. Correlation analysis

Table 3 exhibits the correlation matrix. The correlation analysis is done between the independent and control variables to validate the data and to see if there is any issue of multicollinearity. The table of correlation shows that there is no issue of multicollinearity in the data as there is no value of correlation coefficient that is above 0.5. From the table, it can be seen that there is a negative correlation between EM and OwnSt, ROE, Sze. On the other hand, EM is positively correlated to Lvg and Lqdy. However, this correlation is only significant between EM & OwnSt (at 1% level) and between EM & Lvg (at 5% level). OwnSt is positively and significantly correlated to ROE (at 1% level) and Lqdy (at 5% level). On the contrary, there is a negative significant correlation between OwnSt & Lvg (at 1% level). Moreover, ROE is positively and significantly correlated to Sze (at 1% level) and significantly negatively correlated to Lvg (at 5% level). A negative and significant correlation is observed between Lvg and Lqdy at 1% level.

### 5.3. Logit analysis

The logit analysis results are tabulated in Table 4. Logit analysis is employed in the study to see the impact of EM on FD and EM on FD in the presence of OwnSt as a moderator. In model 1, the impact of EM on FD is seen. In model 2, only OwnSt has been added as an independent variable while in model 3, OwnSt has been added as a moderator by creating an interaction term of EM and OwnSt as EM\*OwnSt.

Cox & Snell  $R^2$  tells us the variation in the response variable explained by the model explained. The values of this  $R^2$  in model 1 shows that 12.6% variation in FD is explained by the model; however, this explanation has increased in model 2 (29.1%) and model 3 (29.4%). To simply put, we are 12.6% confident in model 1, 29.1% confident in model 2, and 29.4% confident in model 3 that our models are correct.

**Table 4. Logit regression: EM as independent variable and ownership structure as moderator**

	Model 1			Model 2			Model 3		
Outcome variable	FD			FD			FD		
Moderator							Ownership structure		
	$\beta$	Sig.	Exp ( $\beta$ )	$\beta$	Sig.	Exp ( $\beta$ )	$\beta$	Sig.	Exp( $\beta$ )
EM	0.401	0.000	1.494	0.352	0.000	1.422	1.393	0.001	4.027
OwnSt				-8.010	0.000	0.000	-8.858	0.000	0.000
EM*OwnSt							-1.849	0.011	0.157
ROE	-0.531	0.000	0.588	-0.461	0.000	0.630	-0.462	0.001	0.630
Sze	0.088	0.002	1.092	0.103	0.001	1.109	0.103	0.001	1.108
Lvg	3.250	0.000	25.780	3.486	0.000	32.640	3.451	0.000	31.532
Lqdy	-0.365	0.000	0.694	-0.341	0.000	0.711	-0.366	0.000	0.694
Constant	-1.106	0.013	0.331	2.968	0.000	19.452	3.475	0.000	32.298
Cox & Snell R <sup>2</sup>	0.126			0.291			0.294		
No. of obs	2028			2028			2028		

\* significant at 5% level of significance, \*\* significant at 1% level of significance.

The effects of predictors and moderator on FD are on a log odds metric.

The results of all three models indicate that the coefficient of earnings management (EM) is positive (0.401 for model 1; 0.352 for model 2; 1.393 for model 3) at a 1% level of significance. It means that with a 1% increase in EM, the odds of a company to go into FD are increased by 1.494 times in model 1, 1.422 times in model 2, and 4.027 times in model 3. This result is consistent with the previous researches (DeAngelo et al., 1994; Ghazali et al., 2015). Managers do this EM to avoid the state of financial distress, however, ultimately be facing increased financial distress rather than decreasing it, hence supporting the iron law of EM (Scott, 1997). Moreover, these results also show the existence of type I agency issues in financially distressed firms. The results are thus supporting our first hypothesis which assumed that earnings management increases the financial distress in the firms.

The moderating effect of OwnSt is checked by adding an interaction term (EM\*OwnSt) in model 3. The results are showing that ownership structure is negatively moderating the relationship of EM on FD because the interaction term is showing a negative sign and is also significant at 1% level. It shows that the impact of earnings management on financial distress has become negative in the presence of a strong ownership structure. The impact of earnings management has been reversed in the presence of strong ownership structure, thus reducing the odds of a company being financially distressed by 0.157 times. The odds of being financially distressed company which were increased due to earnings management by 4.027 times have significantly decreased by 0.157 times. The results are thus supporting the “convergence-of-interest/alignment-of-interest hypothesis” and “efficient-monitoring hypothesis” discussed in the literature section. However, the “entrenchment hypothesis” is not supported by the results. These results are also affirming our second hypothesis which is expected that the greater the level of ownership structure, the lesser the positive effect of earnings management on financial distress.

If we see the results of the control variables, all results are expected. Coefficients of profitability (ROE) and liquidity (Lqdy) are negative and significant at a 1% level in all three models which means that increased level of ROE and Lqdy in a firm will decrease its odds of being in the state of financial distress by 0.588 times and 0.694 times, respectively. On the contrary, firm size (Sze) and leverage (Lvg) have shown positive results as expected at a 1% level of significance. We can infer from these results that as Sze and Lvg in a firm are increased, the chances of it going into financial distress are also increased by 1.092 times and 25.780 times, respectively.

## 6. Conclusion

Firstly, this study validates the relationship between earnings management (EM) and financial distress (FD) and shown that earnings management, which is done by managers to avoid the financial distress in a firm, will rather increase the financial distress situation in the business (iron law of EM). The results of the present study have also supported this iron law which was presented by Scott (1997), hence supporting our first hypothesis. Secondly, based on AT, it is found in this article that in the presence of a strong ownership structure (OwnSt), the relationship between EM and FD is reversed, hence supporting our second hypothesis. Strong ownership structure helps the financially distressed firms to overcome their state of FD by reversing the EM, which was deteriorating the state of FD instead of recuperating it.

The findings of the present study demonstrate that in the presence of strong ownership structure in the firms, the impact of EM on FD can be controlled. The findings of the study would also be helpful for the investors as it will help them to analyze a firm regarding its earnings before investing in it. The investors can see based on seeing the ownership structure of a firm that whether a firm is being *entrenched* or being *efficiently monitored* (e.g. presence of ownership concentration, institutional investors, foreign investors) before making any investment decision. This study is also helpful for regulatory authorities to take proper measures regarding control mechanisms in the firms to avoid the situation of financial distress.

Some limitations of the study should be noted. First, the present study has taken the non-financial sector into account. The same research can also be carried out on the financial sector to see the control mechanisms regarding ownership structure. Second, our study uses ownership structure as a moderating variable to investigate the link between EM and FD in the Pakistan context. Different countries have different requirements regarding ownership structure, business practices, over and above their own particular cultures, etc.

Keeping in mind the limitations of this study, more studies can be carried out in different regions for enhancing the interesting understanding of ownership structures on the link between EM and FD in different settings. A comparative study can be of greater interest for this purpose. Moreover, several corporate governance mechanisms can be taken into account to see their impact on the particular relationship.

### Funding

The authors received no direct funding for this research.

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### Citation information

Cite this article as: Efficiently monitoring the ship of financially distressed companies sinking in Iron law of earnings management: Evidence from Pakistan, Muqaddas Khalid, Qaisar Abbas & Mian Sajid Nazir, *Cogent Economics & Finance* (2020), 8: 1838685.

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## Appendix

Ownership structure items (OwnSt)		
S. no.	Variable name	Definition/index scoring
1.	Large directors	No. of shares owned by largest shareholders divided by no. of shares issued. If large directors' ownership is greater than its median, then scored 1, otherwise 0.
2.	Ownership concentration	No. of shares owned by top 5 shareholders divided by no. of shares issued (measured through Herfindahl Index, also known as Herfindahl-Hirschman Index, HHI). If ownership concentration is greater than its median, then scored 1, otherwise 0.
3.	Individual ownership	No. of shares owned by general public/individuals divided by no. of shares issued. If individual ownership is greater than its median, then scored 1, otherwise 0.
4.	Foreign ownership	No. of shares owned by foreigners divided by no. of shares issued. If foreign ownership is greater than its median, then scored 1, otherwise 0.
5.	Institutional ownership	No. of shares owned by financial institutions divided by no. of shares issued. If institutional ownership is greater than its median, then scored 1, otherwise 0.
6.	Joint stock ownership	No. of shares owned by joint stock companies divided by no. of shares issued. If joint stock ownership is greater than its median, then scored 1, otherwise 0.
7.	Associated companies ownership	No. of shares owned by associated or parent companies divided by no. of shares issued. If associated companies ownership is greater than its median, then scored 1, otherwise 0.
8.	Family ownership	No. of shares owned by family members divided by no. of shares issued. If family ownership is less than its median, then scored 1, otherwise 0.
9.	Family controlled	Dummy variable coded 1 if family ownership is 30% or more than 30%, zero otherwise. If family controlled dummy variable is zero, then scored 1, otherwise 0.
10.	Director ownership	No. of shares owned by directors divided by no. of shares issued. If director ownership is greater than its median, then scored 1, otherwise 0.
11.	CEO ownership	No. of shares owned by CEO divided by no. of shares issued. If CEO ownership is greater than its median, then scored 1, otherwise 0.
12.	Inside ownership	No. of shares owned by executives, directors and CEO divided by no. of shares issued. If inside ownership is more than 25% but less than 40%, then scored 1, otherwise 0.
13.	External block-holders	Dummy variable coded 1 if largest shareholder owns more than 10% of shareholding, zero otherwise. If there is presence of external block-holder, then scored 1, otherwise 0.
14.	Institutional activism	Dummy variable coded 1 if there is presence of nominee of financial institution, 0 otherwise. If there is presence of institutional activism, then scored 1, otherwise 0.



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