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**Article**

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## BANKING & FINANCE | RESEARCH ARTICLE

# Financial distress and its determinants: Evidence from insurance companies in Ethiopia

Yonas Nigussie Isayas\*

**Abstract:** This research is aimed to investigate the determinants of financial distress of insurance companies in Ethiopia using balanced panel data from eleven insurance companies for the period covering from 2008 to 2019. A quantitative approach and explanatory design were employed to realize the stated objectives. To achieve the study objectives, secondary data were collected from annual financial statements of sampled insurance companies for the stated period and analyzed using descriptive statistics and a random effect (RE) regression model. The descriptive statistics output of the study revealed that sampled insurance companies are in the safe zone. The RE regression model results show that profitability, firm size, leverage, and company age were negatively correlated to financial distress having a strong negative effect on financial distress. On the other hand, asset tangibility and loss ratio have a positive and statistically significant effect on insurance companies' financial distress. Based on the analysis of findings, the study suggests that Insurance Companies in Ethiopia shall be more concerned about the internal environment (factors) while developing policies and strategies to manage the financial distress condition.

**Subjects:** Public Finance; Corporate Finance; Insurance

**Keywords:** altman's z-score; determinant factors; ethiopia; financial distress; insurance companies



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### ABOUT THE AUTHOR

Name of Author: Yonas Nigussie Isayas  
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I graduated with BSc in Accounting & Finance from University of Gondar on 5 August 2008 and then joined Haramaya University as graduate assistant. After two years of stay I left for Msc degree and I graduated with MSc in Accounting & Finance from Addis Ababa University, 2012. Since then, I have been teaching different accounting courses at the university and engaged in researches in various research areas. I am keen of doing researches alone and with others in multi disciplinary cases.

### PUBLIC INTEREST STATEMENT

The study conducted is entitled “**Financial Distress and Its Determinants: Evidence from Insurance Companies in Ethiopia**”. It tried to address factors that affect the financial distress in insurance companies in Ethiopia using data collected from sample insurance companies' financial statements. It is aimed purely at identifying the factors and suggesting some recommendations to the management for their policy making purposes.

This research may contribute to the improvements of financial distress condition in Ethiopian Insurance companies if the management of these companies considers the findings of this study and the recommendations given thereby.

Regards,  
Yonas Nigussie Isayas  
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## 1. Introduction

It is obvious that the insurance industry is one of the most important elements of the financial sector as well as the economy of a nation and its benefits cannot be underestimated. A country's economy will be adversely affected by the failure of the insurance industry (Donnelly, 2007). Insurance firms protect the resources used in the operation of other sectors of the economy which foster economic growth and a favorable investment environment within the economy (Enyew et al., 2019).

Along with its basic role of providing protection to the insured against financial loss as well as being a source of security, the insurance industry also offers employment opportunities through its marketing and distribution networks. It is also important to recognize that the industry is a vital source of funds through its pooling system and contributes to the Gross Domestic Product (GDP) of the country (Moyer & Chatfield, 1983). The absence of this key sector in a given economy might result in a shocking and devastating economic crisis (Rand, 2004). Therefore, insurance companies are considered to be an umbrella of all other sectors of an economy, which brings an encouraging operating climate by providing protections against possible losses of many kinds (Enyew et al., 2019).

As stated in Andrade and Kaplan (1997) and cited by Enyew et al. (2019), financial distress is a circumstance in which a firm cannot fulfill its debt obligations to the creditors, which in return leads to either restructuring or bankruptcy. Financially distressed firms are believed to face multiple difficulties including operational insolvency, dividend reductions, losses, plant closings, reduced stock prices, and loss of customers, valuable suppliers, and key employees (Purnanandam, 2008). Since the insurance sector is strongly connected to and serves almost all sectors of the economy, the failure of firms in the insurance sector will spread to other sectors in the economy. Financial institutions including insurance companies are very sensitive to factors that affect their financial health.

Even though considerable empirical investigations had been conducted to identify the most important factors that determine the level of financial distress in an insurance company (such as Cheluget et al., 2014; Pranowo et al., 2010; Ogawa, 2003) in countries around the globe; studies that have been conducted in Ethiopia concerning what determines financial distress in the insurance sector are very few. In addition, most previous studies conducted in other industries in

Ethiopia have used debt service coverage, a univariate analysis technique that uses a single financial ratio, operating income/total debt service costs, as a proxy for measuring financial distress. In this Study, ZETA analysis, a multivariate analysis technique is used. Edward I. Altman in 1968 was the first researcher to develop a multivariate statistical model to discriminate failure from non-failure firms using five financial ratios. In this study, the researcher used the Altman's Z"-Score model (ZETA score) as a proxy for measuring financial distress.

### 1.1. Objectives of the study

The general objective of this study is to assess the financial distress condition and its determinants in Ethiopian Insurance companies.

### 1.2. Specific objectives are stated as follows

- (1) To examine the financial distress condition of insurance companies in Ethiopia
- (2) To assess the effect of firm-specific factors including profitability, liquidity, firm size, leverage, capital adequacy, earnings growth, firm age, loss ratio, and asset tangibility on financial distress in Ethiopian Insurance companies

### 1.3. Hypotheses

H1: Profitability affects financial distress of insurance companies in Ethiopia

H2: Firm Size affects financial distress of insurance companies in Ethiopia H3: Leverage affects financial distress of insurance companies in Ethiopia H4: Liquidity affects financial distress of insurance companies in Ethiopia

H5: Capital adequacy affects financial distress of insurance companies in Ethiopia H6: Earnings Growth affects financial distress of insurance companies in Ethiopia H7: Company age affects financial distress of insurance companies in Ethiopia H8: Asset Tangibility affects financial distress of insurance companies in Ethiopia H9: Loss ratio affects financial distress of insurance companies in Ethiopia

## 2. Literature reviews

### 2.1. Insurance sector in Ethiopia

The history of insurance service is as far back as a modern form of banking service in Ethiopia, which was introduced in 1905. At the time, an agreement was reached between Emperor Menelik II and a representative of the British-owned National Bank of Egypt to open a new bank in Ethiopia. Similarly, modern insurance service, which was introduced in Ethiopia by foreigners, marks out their origin as far back as 1905 when the bank of Abyssinia began to transact fire and marine insurance as an agent of a foreign insurance company. According to a survey made in 1954, nine insurance companies were providing insurance service in the country.

Except for Imperial Insurance Company that was established in 1951, all the remaining insurance companies were either branches or agents of foreign companies. In 1960, the number of insurance companies increased considerably and reached 33. At that time, insurance business like any business undertaking was classified as a trade and was administered by the provisions of the commercial code (Hailu, 2007).

In the last few decades, the Ethiopian financial institutions in general and insurance companies, in particular, have shown impressive progress in terms of number and service which not only creates employment opportunities but also enhances the business activities in the Ethiopian economy (Hailu, 2007). The first significant event that the Ethiopian insurance market observed was the issuance of proclamation No. 281/1970 and this proclamation was issued to provide for the control and regulation of insurance business in Ethiopia. Consequently, it created an insurance council and an insurance controller's office, its strange impact in the sector. The controller of insurance licensed 15 domestic insurance companies, 36 agents, 7 brokers, 3 actuaries, and 11 assessors under the provisions of the proclamation immediately in the year after the issuance of the law (Hailu, 2007).

### 2.2. Concepts of financial distress

In corporate finance, the concept of financial distress deals with a situation in which a firm fails to meet debt obligations to its creditors. It is believed that the majority of business failures are attributed to financial distress. In other words, financial distress can be put as a condition of being in severe financial difficulties that might lead to bankruptcy (Chang-e, 2006; Pranowo et al., 2010).

According to Ray (2011) a firm experience financial distress where there is a violation of loan contracts and when organization incur constant losses and fails to honor obligation when it is due. When the firm experiences financial distress, the operating conditions of the firm deteriorate thus leading to a heavy financial burden on the firm resulting in the inability of the firm in paying both secured, preferential and unsecured creditors (Benmelech et al., 2012; Garlappi & Yan, 2011). Wesa

and Otinga (2018) noted that financially distressed firms are usually faced with two possible major problems either they are experiencing cash shortage on the asset side or overdue obligation on the liabilities sides of the statement of financial position. The adverse effect of financial distress in an organization threatens the continued survival of firms.

According to reports of the National Bank of Ethiopia (2017), the insurance industry in Ethiopia has been playing a vital role in the development of the Ethiopian economy, and the contribution provided by the sector on the economic growth and the level of national wealth is characterized by rapid growth (Zelie and Wassie, 2019). Between the years of 2012 and 2017, the premium generated in the Ethiopian insurance industry is increased tremendously from year to year; for instance, Ethiopian insurance companies have collected a total premium of Birr 7.5 billion from both life and non-life (general insurance business). The premium generated by life insurance constituted only Birr 400 million or 5% of the total premiums, while general insurance premium amounted to over Birr 7.1 billion or 95% of the total premiums. The premium of the general insurance for the year 2015/16 was Birr 6.2 billion and as stated above the amount increased to Birr 7.1 billion.

This showed that the premium generated from general insurance in the year 2016/17 is increased by 14.5 percent with the same token the number of branch offices operated with the stated insurance companies increased from 414 in the year 2015/16 to 482 in the year 2016/17 (2016/17 annual report of Africa insurance and National Bank of Ethiopia). However, in recent times, there have been more insurance firms going into distress than any other sectors in the country due to unfavorable government policies, inflation, and exchange rate problem, political unrest, and inadequate social and infrastructural facilities among others (Zhang et al., 2015). Enyew and Fekadu (2019) also evaluate the financial distress condition and its firm-specific determinant factors in the Ethiopian insurance industry using data ranging from 2007 to 2016 and found that the financial health condition of the insurer's understudy was not in a safe condition and it shows continuous fluctuations.

### **2.3. Theories of financial distress**

Several theories can be used to outline the characteristics of a firm in financial distress; to select the predictors to the models, and to justify the functional form between these predictors and these are Liquid Asset Theory, Liquidity and Profitability Theory, Balance Sheet Decomposition Measure, Cash Management Theory and Credit Risk Theory. Most of the mentioned theories have been applied by Altman and Hotchkiss (2006).

#### **2.3.1. Liquid asset theory**

The theory explained financial distress within the framework of a cash flow. This theory is based on the concept that net cash flows relative to current liabilities should be the primary standard to be used to describe a company's financial distress condition. Firms that have positive cash flows can increase their capital and borrow from the capital market, whereas firms which have negative or inadequate cash inflow are unable to borrow from the capital market. Therefore, they face the risk of default. According to this theory, a firm is anticipated to go bankrupt whenever the current year's profit or net cash flow is negative or less than the level of debt obligations. This situation is called technical insolvency. Technical insolvency exists when a firm cannot meet its current financial obligations, signifying a lack of liquidity (Altman & Hotchkiss, 2006).

#### **2.3.2. Liquidity and profitability theory**

According to Hashi (1997), when the firms' indicators (liquidity and profitability) are good it is perceived as healthy, but it is perceived as unhealthy and at risk of bankruptcy if the indicators are poor. A positive and high level of these two indicators shows a lower risk of bankruptcy. This theory suggests that a firm can fail even though its profitability is good. If the firm's growth rate is significantly greater than the internal rate of return, its revenue flow can be inadequate to finance

expenditures and the firm is unable to pay its obligations if it is highly indebted. The firm's profitability should be greater than the company's growth rate.

### 2.3.3. *Balance Sheet Decomposition Measure (BSDM)*

One way of identifying firms' financial distress is a cautious look at the major changes happening in their balance sheets (Aziz & Dar, 2006). If a firm's balance sheet shows significant changes in its composition of assets and liabilities over a reasonable time, it is more likely that the firms are unable to maintain the equilibrium state. Since these changes are likely to become uncontrollable in the future, we can anticipate financial distress in these firms (Monti & Moriano, 2010).

### 2.3.4. *Cash management theory*

The management of cash balances is the most important concern of each firm. This is because it is challenging to predict cash flows precisely, particularly the inflows, and there is no perfect concurrence between cash inflows and outflows. An imbalance between cash inflows and outflows would signal the failure of the cash management function of the firm, which may eventually cause financial distress to the firm and, hence, business failure (Aziz & Dar, 2006).

### 2.3.5. *Liquidity risk theories*

According to Westgaard and Wijst (2001), liquidity risk is the risk that a borrower will default, that is, fail to repay an amount owed to the bank. The theory states that liquidity Risk cycles follow business cycles closely, that is, a worsening economy would be followed by downgrades and defaults increase. Here, defaults probability of a firm is a function of macroeconomic variables like the unemployment rate, interest rates, growth rate, government expenses, foreign exchange rates, and aggregate savings, etc. Liquidity Risk is therefore the investor's risk of loss, financial, or otherwise, arising from a borrower who does not pay his or her dues as agreed in the contractual terms (Nyunja, 2011).

## 2.4. *Financial distress determinants*

### 2.4.1. *Profitability*

Profitability ratios indicate how effective a company is in generating profits given sales and/or its capital assets and measure a company's ability to generate revenue over expenses. The research conducted on a financially distressed firm suggests that taking actions of adjusting the business to increase profitability (Chang-e, 2006). Campbell et al. studied the determinants of corporate failure and the pricing of financially distressed stocks and shows lower profitability

will lead to a higher level of financial distress that increases the chance to fall into bankruptcy. Thus, it implies that there is an inverse relationship between profitability and financial distress.

### 2.4.2. *Firm size*

Several studies conducted evidenced that firm size is one of the key determinants of corporate financial distress and inversely related to financial distress. According to Honjo (2000), small firms have the likelihood to fail than big firms because small firms have poor market experience, limited connection, and limited financial resources. Denis and Mihov (2003) argued that firm size is the most essential determinant in a firm's employment of public debt. Freixas et al. (2000) also argued that firm size is negatively related to the probability of a firm going bankrupt.

### 2.4.3. *Liquidity*

Liquidity, which indicates the firm ability to meet short-term maturing obligations, has also been shown as an important determinant of corporate financial distress in various studies. The study conducted by Nahar (2006) showed that an increase in liquidity leads to a decrease in corporate financial distress. Similarly, Thim et al. (2011) indicated that there is a negative link between liquidity and financial distress. However, studies conducted by Gathecha (2016) and Kristanti et al. (2016) indicated that liquidity has a positive link with financial distress.



#### 2.4.4. Leverage

The firms' leverage ratio shows how heavily the firm is in debt giving an idea of the amount of leverage used by the company. Financially distressed firms often suffer from huge debt burdens characterized by high-interest payments. When a firm borrows money, it promises to make a series of interest payments and then repay the amount that it has borrowed. Studies conducted by Gathecha (2016) and Chancharat (2008) indicate that corporate financial distress will rise when there is an increase in firm leverage. However, Kristanti et al. (2016) and Tesfamariam (2014) revealed that leverage and financial distress have a negative relationship.

#### 2.4.5. Capital adequacy

The capital adequacy ratio is designed to ensure how well firms can absorb a reasonable level of loss before becoming insolvent. That means, the firm with the higher capital adequacy ratio will be able to withstand the greater level of unexpected losses, that is, they can become highly resilient to financial distress. According to (Dang, 2011), the capital adequacy ratio shows the internal strength of the institution to withstand losses during a crisis. Financial institutions' capital creates liquidity since deposits are most fragile and prone to runs. Moreover, greater capital reduces the chance of distress (Jones, 1987).

#### 2.4.6. Earnings growth

Premium revenue is the primary source of revenue for most insurers, and it is generally more persistent than other revenue sources. Therefore, premium growth should help predict future revenue and earnings growth. Empirical evidence showed premium growth and financial distress in insurance companies have a negative relationship. Yosha (1995), MacKie-Mason (1990), Khan & Jain, (2004), Harris and Raviv (1990) found a significant negative relationship between premium growth and financial distress in their studies.

#### 2.4.7. Company age

The age of the company is one of the most influential characteristics in organizational studies and is an important determinant of financial performance. Newly established insurance is not particularly stable in their first years of operation, as they place greater emphasis on increasing their market share, rather than on improving and maintaining financial healthiness.. Similarly, Beaver (1966) indicates that older insurance expected to be more financially stable and healthier due to their long tradition and the fact that they could build up a good reputation.

#### 2.4.8. Asset tangibility

The tangibility of assets in insurance companies in most studies is measured by fixed assets over total assets. A high ratio indicates an inefficient use of working capital which reduces the firm's amount of current assets. Various research findings suggested that having a high ratio of the fixed asset compared to the current asset is negatively related to financial distress (Gathecha, 2016). This concept was also supported by findings of Elloumi and Gueyie (2001), Turetsky and McEwen (2001), Abdulla (2006), and Thim et al. (2011), who have found a negative and significant relationship between asset tangibility and insurance companies' financial distress.

#### 2.4.9. Claim incurred (loss) ratio

The claims ratio also termed as loss ratio in the insurance business is defined as the claims incurred to net premiums earned. If this ratio is high, it indicates that a lesser amount is available for expense recovery and thereby has a positive impact on the financial distress of insurance companies. Insurance firms with higher claim ratios should be at greater risk of insolvency. Conversely, one might expect that firms with lower loss ratios should be better performers, all else equal (Freixas et al., 2000). Additionally, findings by Ohlson (1980), Ennis and Malek (2005), Denis and Mihov (2003), Chemmanur and Fulghieri (1994), and Horrigan (1966), and Palepu (1986), and Rajan and Zingales (1995) indicated a positive relationship between claim (loss) ratio and insurers' financial distress.



### 3. Materials and methods

This study attempted to investigate the determinants of financial distress of Insurance Companies in Ethiopia. In light of the research objective and the quantitative nature of the data, this study employed a quantitative approach to identify the determinants that affect Insurance Companies' financial distress. Accordingly, this study adopted an explanatory research design to examine the cause and effect relationships between financial distress and the determinant variables.

From the total population of 17 insurance companies in the country, only 11 insurance companies that have 12 years of audited financial data from 2008 to 2019 are considered as a sample purposefully. The study used secondary data, which included the audited annual financial reports of insurance companies under study. The data were strongly balanced panel types, which captured both cross-sectional and time-series behaviors.

#### 3.1. Methods of data analysis

The study used both descriptive statistics and econometric tools to analyze the data. The descriptive analysis includes simple descriptive methods, such as mean, maximum, minimum, standard deviations, and others that enable to better understand the existing situation and analyze the general trends of the data. The study substantiated the descriptive analysis by manipulating econometric models to examine the cause and effect relationship between the explanatory and dependent variables. In this regard, the study employed Random Effect Model to identify determinants that significantly affect the financial distress of Insurance Companies. The Hausman test was performed to choose between the random effect (RE) model and fixed effect (FE) model and the test result showed a P-value of 0.9952 indicating that the random effect model is the appropriate model for the analysis purpose (see [appendix D](#)).

The researcher has also conducted different tests to check the model fitness and the tests results are put in the appendices A, B, & C.

#### 3.2. Definition and measurements of variables

##### 3.2.1. Dependent variable

The dependent variable employed in this study is the Altman Z score (AMZ) to measure financial distress. The Altman Z score is used in measuring firm financial health by predicting the likelihood that a firm will become distressed within 2 years (Eboiyehi & Ikpesu, 2017, 2017;; Kristanti et al., 2016). When the z score is greater than 2.9, the firm is in a safe zone, if the z score is between 1.23 and 2.9, is an indication that the firm is in a grey zone but if the z score is below 1.23, the firm is regarded to be in a distress zone (Altman (1968))

$$\text{Altman Z- score} = 3.25 + 6.56X1 + 3.26X2 + 6.72X3 + 1.05X4$$

(Z-score for non-manufacturing and Emerging Market)

Where: Z" = financial distress score as measured by Altman model,

X1 = Working capital/total assets,

X2 = Retained Earning/total assets,

X3 = EBIT/total assets and

X4 = Book value of equity/total debt.

**Table 1. Summary of variables and their measurement**

Category	Variable Name	Measurement
Dependent Variable	Financial Distress	Altman Z score
Independent Variables	Profitability (ROA)	Net Income/ Total Asset
	Firm Size (Size)	Log of Total Assets
	Liquidity (LQ)	Current Asset/Current Liability
	Leverage (LEV)	Total debt/total equity
	Capital Adequacy (CA)	Equity/Total Asset
	Earnings Growth(PG)	$(EBIT_t - EBIT_{t-1})/EBIT_{t-1}$
	Firm Age (AGE)	Number of years the firm operated
	Loss Ratio (LR)	Loss claimed by client/Gross Premium
	Asset Tangibility (ATN)	Plant Asset/Total Asset

Source: Developed based on the literature

### 3.2.2. Independent variables

Depending on the research hypothesis, the explanatory variables used to determine the financial distress of Insurance Companies in Ethiopia are profitability, firm size, liquidity, leverage, capital adequacy, earnings growth, company age, loss ratio, and asset tangibility. Those variables are used and reported significant by various studies as determinants of insurance companies' financial distress with different combinations (Cheluget et al., 2014; Dang, 2011; Pranowo et al., 2010; Yohannes, 2014, and Carpeto, et al., 2010).

Table 1 presented the summary of variables and their expected effect on financial distress. Some of the variables were computed to their log form for compatibility of the regression.

To identify the effect of determinant variables on the financial distress of Insurance Companies this research formulated the following econometric models.

$$FDit = \alpha + \alpha\beta_1(ROA)it + \beta_2(LQ)it + \beta_3(CA)it + \beta_4(LEV)it + \beta_5(Size)it + \beta_6(PG)it + \beta_7(ATN) + \beta_8(Age)it + \beta_9(LR)it + \varepsilon it \quad (1)$$

Where, FD is the Financial Distress, ROA is the Return on Asset, LQ is the Liquidity, CA is the Capital Adequacy, LEV is the Leverage, Size is the Firm Size, PG is the Premium (Earnings) Growth, ATN is the Asset Tangibility, Age is the Company Age and LR is the Loss Ratio, i is the ith Insurance Companies, t is the time,  $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8$  and  $\beta_9$  are the coefficients for each independent variables in the model,  $\varepsilon_{it}$  is the error term.

## 4. Results and discussion

### 4.1. Descriptive statistics

As indicated below, Table 2 presents the results of the descriptive statistics for both dependent variable, the financial distress (FD), and independent variables such as profitability (ROA), firms' liquidity (LQ), leverage (LEV), firm size (Size), age of companies (Age), loss claimed ratio (LR), asset tangibility (ATN), premium growth (PG) and capital adequacy (CA). The average value of financial distress is 2.97, which implies that sampled insurance companies included in the study are within the safe zone. The minimum and maximum values of this variable are 0.45 and 10.69 with a standard deviation of 2.45. The result indicates the existence of insurance companies in a distress zone and high dispersion in the distress level of insurance companies in Ethiopia.

**Table 2. Descriptive statistics for the dependent and explanatory variables**

Variable	Obs = 132	Mean	Std. Dev.	Min	Max
FD		2.9715	2.4583	0.4543	10.696
ROA		1.8385	17.352	1.4444	18.987
Age		22.871	8.9036	12	45
Size		8.6514	0.6022	6.2137	9.7607
LQ		7.5611	8.8139	0.2226	48.0826
ATN		0.1494	0.1536	0.0139	0.8829
PG		1.7587	4.2949	-0.9965	7.3087
LR		3.8847	5.5196	0	36.4625
LEV		4.3098	8.8991	0.0628	85.5347
CA		0.6414	0.6859	0.0963	0.6303

Source: own computation, 2020

Regarding the explanatory variables, the average value of profitability (ROA) is 1.83, which

indicates that 1 birr and 82 cents were generated from one birr investment on assets of insurance companies. The minimum and maximum values are 1.44 and 18.98 with a large standard deviation value of 17.35 among sampled insurance firms. The average value of company age is 22.87, which shows that the average age of insurance companies is 22 years and 10 months. The minimum age and maximum age of insurance companies was 12 years and 45 years, respectively, with a standard deviation of 8.9.

The average asset (Size) of Ethiopian insurance companies is 8.65 (448 Million) with a minimum value of 6.21 (1.6 Million) and maximum values of 9.76 (5.7 Billion) and a standard deviation of 0.60 among the sampled insurance companies asset size in Ethiopia. The average value of liquidity is 7.56 implying that insurance companies in Ethiopia possess a liquidity position that exceeds the standard liquidity ratio of 2:1. The minimum and maximum values of liquidity are 0.22 and 48.08, respectively, with the standard deviation of 8.81, which indicates the existence of large variation among the sampled firms' liquidity position. Asset tangibility has an average value of 0.14 which shows that the fixed assets of the firm cover 14% of the total asset. The minimum and maximum values of 0.0139 and 0.88, respectively, with the standard deviation of 0.15 which indicated the existence of slight deviation from the mean.

The mean value of premium growth is 1.75 with a minimum value of -0.99 and a maximum value of 7.308. The standard deviation of premium growth amounts to 4.29. Leverage has an average value of 4.30 which shows that the debt financing of insurance companies is four times greater than equity financing and this, in turn, leads to firm insolvency. The minimum and maximum values are 0.62 and 85.53 with a standard deviation of 8.89, which is a large variation from the mean. The loss ratio that measures total claim incurred over total earned premium has an average value of 3.88 while the minimum and maximum values are 0 and 36.46. The standard deviation of the loss ratio is 5.519, which implies that there is a big variation among the companies regarding the loss ratio. Capital adequacy that is measured by the ratio of equity to the total asset has a mean value of 0.64 with minimum and maximum values of 0.096 and 0.63, respectively, while the standard deviation is 0.68.

#### 4.2. Regression results and discussion

Table 3 presented the random effect regression results to identify the determinants of financial distress. The variables included in the model explained about 99% of the total variation on

**Table 3. Random effect model result for identifying determinants of FD**

Explanatory Variables	Coefficient	Std. Err.	Z-value
ROA	-0.2963***	0.0273	512.23
Age	-0.1808***	0.0487	-3.72
Size	-4.5667***	0.8705	-5.25
LQ	-0.0066	0.0053	-1.26
ATN	-5.3144***	3.1851	-1.67
PG	-0.0582	0.0498	1.17
LR	0.3159***	0.0869	3.63
LEV	0.1245***	0.0525	-2.37
CA	-0.1669	0.3072	0.54
_cons	47.1247	7.6469	6.16
R <sup>2</sup> Within	0.9996	sigma_u	0
R <sup>2</sup> Between	0.9997	sigma_e	4.7666
<b>R<sup>2</sup> Overall</b>	<b>0.9996</b>		

\*\*\*and\*\* implies significant at 1 and 5% level of significance, respectively. Source: Own computation, 2020

financial distress, which is reasonably a good fit. This implies that the explanatory variables (such as profitability, company age, firm size, asset tangibility, loss ratio, and leverage) jointly explained about 99% of the total variation in the financial distress.

The model result shows that **profitability** has a negative and significant effect on the financial distress of insurance companies in Ethiopia. The result shows that an increase in profitability leads to decreased financial distress, which is consistent with the prior expectation and the findings of (Ohlson, 1980; Lo, 1986; Gombola et al., 1987). Chang-e (2006) and Campbell et al. (2005) have found a negative and significant relationship between profitability and financial distress suggesting that lower profitability will lead to a higher level of financial distress that increases that chance to fall into bankruptcy. However, findings from Zelig (2019) and Cheluget et al. (2014) show that there is a positive relationship between profitability and financial distress of insurance companies.

**Company Age** refers to the period that an insurance company has been in operation since its initial inception. Age has a negative and statistically significant effect on financial distress, which implies that, as insurance firms mature, and thus acquires experience in the sector; they increase their likelihood of attaining financial health since insurance companies gradually improve their control over all operations related to obtaining the required level of solvency and financial health. The result is in line with prior expectations and with findings of Flannery and Hankins (2013); Beaver (1966), who found a negative and significant relationship between company age and distress.

**Firm Size** has a negative and statistically significant effect on financial distress, which suggests that larger insurance companies are likely to be more stable and leading the companies to be out of the distress zone. The result is consistent with prior expectations and the findings of Le Clere, (2005), Hensher and Jones (2007), Fich and Slezak (2008), and Tinoco and Wilson (2013) who found firm size significant variable influencing the financial distress negatively. On the other hand, Research findings by Chancharat (2008) revealed that the likelihood of financial distress is expected to increase when firm size rises. Similarly, Parker et al. (2002) and Thim et al. (2011) research findings all indicate that the link between firm size and financial distress is positive. These findings were also supported by the research work of Parker et al. (2002), Rath (2008), and Tesfamariam (2014).

**Asset tangibility**, which was measured as a ratio of fixed assets to total assets, has a negative and statistically significant effect on financial distress. The higher asset tangibility ratio implies a large amount of investment in fixed assets compared to investment in current assets. Therefore, the result indicates that a company with a large volume of fixed (plant) assets compared to its current asset holds a better position in its financial health and stability, which keeps it out of financial distress. This finding is consistent with the hypothesis of the study and similar with empirical evidence of Gathecha (2016), Elloumi and Gueyie (2001), and Thim et al. (2011), who have found a negative and significant relationship between asset tangibility and insurance companies' financial distress.

The **loss ratio**, which is measured by the ratio of incurred claims to earned premium, is found to have a positive and statistically significant effect on the financial distress of insurance companies. The positive coefficient of this variable indicated that as the number of claims increased in comparison to the earned premium leads to poor financial healthiness of the insurers since it can also increase the amount of expenses. The result is in line with the findings of Wasike and Ngoya (2016), Peter and Slatkin (2013), and Hifza (2011) who found a positive and significant relationship between loss ratio and financial distress.

Likewise, **leverage** measured as the ratio of total liability to total equity is another independent variable found to have a positive and statistically significant effect on financial distress. The result suggested that a high level of debt poses a major challenge to insurance companies in influencing financial distress. The model result is consistent with capital market theory and supported by the findings of Gathecha (2016), and Chancharat (2008) indicates that corporate financial distress will rise when there is an increase in firm leverage. However, the finding is against Kristanti et al. (2016) and Tesfamariam (2014) who revealed that leverage and financial distress have a negative relationship. Furthermore, findings by Baimwera and Murinki (2014) revealed that leverage had no significant influence on corporate financial distress.

#### The operational model along with estimator values

$$\begin{aligned} \text{FDit} = & \alpha - 0.2963\beta_1(\text{ROA})_{it} - 0.0066\beta_2(\text{LQ})_{it} - 1669\beta_3(\text{CA})_{it} + 0.1245\beta_4(\text{LEV})_{it} \\ & - 4.5667\beta_5(\text{Size})_{it} - 0.0582\beta_6(\text{PG})_{it} - 5.3144\beta_7(\text{ATN})_{it} \\ & - 0.1808\beta_8(\text{Age})_{it} + 0.3159\beta_9(\text{LR})_{it} + \epsilon_{it} \dots\dots\dots 1 \end{aligned}$$

#### 5. Conclusions and recommendation

As it has been stated in the objectives of this study, one of the aims was to examine the financial distress condition of insurance companies in Ethiopia. Based on the result of descriptive analysis, the average value of financial distress as measure by Altman Z-score is 2.97, which implies that insurance companies in the country were found to be within the safe zone during the period covered in this study. The other basic research objective attempted to address was identifying factors determining financial distress in Ethiopian insurance companies. Based on the objectives of this study, the following conclusions were drawn from the findings and discussion made above.

The dependent variable financial distress (FD) was found to be highly affected by the independent variables listed in the objective and hypothesis of the study. As per the findings from the analysis, financial distress and profitability were strongly correlated. Profitability has a negative and statistically significant effect on financial distress. This tells that firms generating adequate profit will suffer a little from financial distress. Concerning company age, there is a negative correlation between age and financial distress suggesting that age has a negative and statistically significant effect on financial distress. Moreover, this implies that an insurance company with high-level experience due to its maturity can attain good financial health and control its solvency condition.

Firm size is found to have a negative and significant effect on financial distress and this indicates that firms with large size as measure by their total assets will be in a better position of financial health and in turn minimize their bankruptcy risk. Asset tangibility was negatively correlated to financial distress and the negative effect of this variable explains that a company with a large volume of fixed (plant) assets compared to its current asset holds a better position in its financial health and stability, which keeps it out of financial distress.

On the other hand, loss ratio and financial distress were positively correlated and the positive relationship showed that increased claims compared to the premium earned might lead to financial distress condition. The other variable that positively correlated with financial distress was leverage. This result suggested that a high level of leverage (debt) poses a major challenge to insurance companies in dealing with financial distress. The remaining variables such as liquidity, premium growth, and capital adequacy were negatively correlated with financial distress but their effect was found to be statistically insignificant.

Based on the findings of the study, the following significant policy and operational directions are forwarded. In making financial decisions and developing financial policies and strategies, the board of directors should consider the aforementioned significant determinants of financial distress as a signal in monitoring their firm financial position as this might provide an early warning signal for corporate financial distress. Corporate managers also need to determine and maintain the appropriate level of liquidity, leverage, profitability, and revenue growth to ensure smooth operation and continual survival of the organization. Furthermore, the government needs to pay special attention to the insurance industry by creating a conducive atmosphere and infrastructural facilities to reduce the likelihood of financial distress in the sector. Finally, future studies may investigate the determinants of financial distress by employing a mix of firm-specific and macroeconomic variables.

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## Appendix A Random effect model result for identifying determinants of FD

FD	Coef.	Std. Err.	t	P> z	[95% Conf.	Interval]
ROA	-.296316	.0272595	512.23	0.000	13.90973	14.01659
Age	-.1808203	.0486701	-3.72	0.000	-.2762118	-.0854287
Size	-4.566723	.870474	-5.25	0.000	-6.272821	-2.860626
LQ	-.0066418	.0052918	-1.26	0.209	-.0170136	.00373
ATN	-5.314368	3.185137	-1.67	0.015	-11.55712	.9283858
PG	-.0581841	.0497962	1.17	0.243	-.0394146	.1557828
LR	.3158856	.0869241	3.63	0.000	.1455175	.4862537
LEV	.1245488	.0525141	-2.37	0.018	-.2274746	-.0216229
CA	-.1669284	.3071972	0.54	0.587	-.4351669	.7690238
_cons	47.12468	7.64695	6.16	0.000	32.13693	62.11243
R <sup>2</sup> Within	0.9996					
R <sup>2</sup> Between	0.9997					
<b>R<sup>2</sup> Overall</b>	<b>0.9996</b>					
sigma_u	0					
sigma_e	4.7666363					
Rho	0					

Source: Own computation, 2020

## Appendix B Multi-collinearity test for FD

Variable	VIF	1/VIF
SIZ	1.57	0.636613
CA	1.55	0.646290
ATJ	1.37	0.727279
LQ	1.37	0.732595
LR	1.32	0.758663
ROA	1.29	0.774710
LIV	1.26	0.794821
AGE	1.08	0.922922
PG	1.02	0.985066
Mean VIF	1.31	

## Appendix C Heteroskedasticity test for FD

Breusch-Pagan/Cook-Weisberg test for heteroskedasticity Ho: Constant variance

Variables: fitted values of FD  $\chi^2(1) = 0.43$

Prob >  $\chi^2 = 0.5097$

## Appendix D Hausman FE

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg Test: Ho: difference in coefficients not systematic

$$\chi^2(8) = (b-B)'[(V_b-V_B)^{-1}](b-B)$$

=0.01

Prob> $\chi^2 = 0.9952$

---Coefficients---				
	(b)	(B)	(b-B)sqrt(diag(V_b-V_B))	
	FE	RE	DifferenceS.E.	
+				
ROA	-4.006529	-.296316	-3.71e-13	8.30e-08
Age	-1.3131333	-.1808203	-1.13e-12	2.50e-07
Size	4.494493	-4.566723	9.06e-16	1.54e-10
LQ	3.2745702	-.0066418	3.28e-12	7.73e-07
ATN	-11.565581	-5.314368	-6.25e-13	1.37e-07
PG	5.6730299	-.0581841	5.73e-14	1.32e-08
LR	-6.3853264	.3158856	-6.70e-12	1.47e-06
LEV	1.6157648	.1245488	1.49e-16	1.36e78
CA	-8.1081424	-.1669284	-7.94e-14	1.21e-08



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