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Determinants of profitability of insurance companies in Ethiopia: evidence from insurance companies from 2011 to 2020 years

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Abstract

The profitability of insurance companies has been the focus of several studies within the rise of economies across the countries worldwide. This study aimed to identify determinants of profitability of insurance companies in Ethiopian. The study used nine insurance companies selected by purposive sampling technique among the total 17 insurance companies in Ethiopia from period of 2011 to 2020 based on their establishment. Descriptive, causal research design and quantitative research approach were adopted in carrying out this study. Classical linear regression model under estimation of ordinary least square was employed to identify the determinants of profitability of insurance companies in Ethiopia at 5% level of significance. The classical linear regression model revealed that variable age of the company, tangibility of an asset, size of the company, managerial efficiency, leverage ratio, premium growth and GDP have a positive coefficient relationship with return on asset while loss ratio and inflation have a negative coefficient relationship with return on asset. On the other hand, age of the company size, managerial efficiency, leverage ratio, liquidity ration inflation and premium growth have statistically significant at 5% confidence interval level, whereas the other variables such tangibility of asset and GDP have no statistical significance at 5% confidence interval level. The insurance companies' previous profit, age of the company, company size, managerial efficiency, leverage ratio, liquidity ratio, loss ratio, premium growth and inflation rate variables are significant key drivers of profitability of Ethiopian insurance companies. Giving due attention to the sector in line with key factors affecting the profitability will improve the overall performance of the insurance companies in Ethiopia.

Keywords: Determinant, Regression analysis, Insurance companies, Return on asset, Ethiopia

Background

Financial institutions are one of the most important components of any country's financial system. Nowadays, in the world of economic growth the roles of financial institutions like banks, insurance companies, and micro-finance institutions have a significant role (Mesele, 2019). In particular, insurance companies play especially great role in economy such to spread the risk over a number of persons who are insured against the risk,

share the loss of each member of the society on the basis of the probability of loss to their risk and provide security against losses to the insured. It also provides certainty, capital, improves efficiency and helps economic progress (Kassahun, 2020).

Due to the many benefits of insurance to individuals and to national economies at large, measures must be put in place to ensure insurance businesses survival in the financial market and to monitor their financial health in order to prevent insolvencies at one side and protect policyholders in today's increasingly competitive markets on the other side (Benedicta, 2015) and cited in Habtamu and Teferi, (2020). Having the above, insurance companies are the one that play vital role in the service-based economy and its services are now being incorporated into wider financial industry. Insurance companies consist the organizations which provide life, fire, accident, causality and many other forms of insurance. The main aim of all insurance companies is maximizing their profit because one goal of financial management is to maximize the owner's wealth and profitability is very important determinants of performance, in the work of Ngoyen (2006) and Hailu (2007) and cited in Mingizem (2017). Then, investment in insurance business is now a daytime confirm a most important function in the growth of the financial services which eventually leads to the overall accomplishment of the economy.

In Ethiopia a lot of research has been done on financial institutions profitability with different statistical models and researchers. For instance, Bernabas (2018), Habtamu and Teferi (2020), Abate (2012), Daniel and Tilahun (2013) all studied by using internal factors and have not considered external factors like macroeconomic (gross domestic products, Inflation). And similarly, Sambasivam and Ayele (2013), Yuvaraj and Abate (2013), studied firm-specific factors but they also ignored macroeconomic factors affecting profitability. In general, most of them did not give an emphasis on external and basic internal factors considered to be affecting profitability of insurance company. Therefore, this study tried to identify determinants (both internal and external factors) of profitability of insurance companies using classical linear regression model and provide evidence for policymakers and associates in the industry to implement strategic actions for achieving and sustaining growth.

Study objectives

1. To identify the effect of internal factors (age of the company, company size, tangibility of asset, managerial efficiency, leverage ratio, liquidity ratio, loss ratio and premium growth) on profitability of insurance companies in Ethiopia.
2. To determine the effect of macroeconomic factors (growth rate of GDP and inflation rate) on profitability of insurance companies in Ethiopia.

Literature review

Profitability of insurance companies

Profitability refers to the ability of a firm to generate profits which is crucial for insuring the business achieves its financial goals Dicu, Bondoc and Popescu (2019). Profitability is the primary goal of all business ventures. Without profitability the business will not survive in the long run. So measuring current and past profitability and projecting future profitability is very important. It is a measure of evaluating the overall efficiency of the

business. The best possible course for evaluation of business efficiency may be input–output analysis. Profitability can be measured by relating output as a proportion of input or matching it with the results of other firms of the same industry or results attained in the different periods of operations. Profitability of a firm can be evaluated by comparing the amount of capital employed, i.e. the input with income earned, i.e. the output. This is popularly known as return on investment or return on capital employed. Profitable means that insurance companies are earning more revenues than being disbursed as expenses (Suhiliy, 2015).

Factors affecting profitability

Firm-specific determinants

Age of the company Studies have looked at age and its effect on firm performance including Paster and Veronesi (2013) and Cheng (2008) has measure age using similar approaches. Older firms are less efficient as compared to their industry peers; this has been shown high costs, slow cost rates of growth old assets and reduced research and development activities. As firms become older, the quality of corporate governance and chief executive officer compensation also declines; this is consistent with their inability to deal with collective action. According to the study of Jay Angoff Roger Brown (2007) and cited in (Tariku, 2019) found that there is a positive and significant relationship between the age of a company and its profitability as measured by ROA. Similarly, the research conducted on the relationship among firm characteristics including size, age, location, industry group, profitability and growth by Swiss Re (2008) indicated that larger firms are found to grow faster than smaller and younger firms found to grow faster than older firms. The older the firm the more may be the profitability of the firm. This could be justified as experience and efficiency in the operation process may decrease cost of production and he found even that age is the strongest determinant of profitability.

Hypothesis 1 Age of the company has a positive relationship and significant effect with return on asset.

Liquidity ratio Liquidity ratios measure the firm's ability to fulfil short-term commitments out of its liquid assets. Companies with more liquid assets are less likely to fail because they can realize cash even in very difficult situations. It is therefore expected that financial institution with more liquid assets will outperform those with less liquid assets. Daniel and Tilahun (2013) confirmed that there is a positive relationship between liquidity and profitability of financial institutions. However, Pasiouras and Kosmidou (2007) hypothesized a negative relationship liquidity and profitability.

Hypothesis 2 Liquidity ratio has a negative relationship and significant effect with return on asset.

Leverage ratio Leverage refers to the extent to which firms make use of their money borrowings (debts financing) to increase profitability and is measured by total liabilities to equity. Firms that borrow large sums of money during a business recession are more likely to default to pay off their debts as they mature; they will end up with high leverage and are more likely end up with a potential risk of bankruptcy. On the contrary, the lower the firm's borrowings, the lower the leverage, and the risk of bankruptcy will eventually be lower which signifies that business will continue operating. Leverage ratio is measured as a ratio of total liabilities/total asset (Khalid Alkhatib 2012).

Hypothesis 3 Leverage ratio has a positive relationship and significant effect with return on asset.

Tangibility of asset Tangibility is the physical assets that have relatively long period of use in the operation of the business such as land, buildings, machinery, and construction in progress that can offered as collateral to creditors in case of bankruptcy, high level of fixed total assets provide creditors with level of security. Tangibility is computed by dividing fixed assets by total assets (Khalid Alkhatib 2012). According to the study of Asnakew (2011), tangible assets are likely to have an impact on the borrowing decisions of a firm because they are less subjected to informational asymmetries and usually have a greater value than intangible assets in case of bankruptcy. Therefore, it is considered that the availability of such borrowing capacity will affect the profitability of the financial institutions. A study by Daniel and Tilahun (2013); Hifza (2011), found positive and significant relationship between asset tangibility and profitability of financial institutions.

Hypothesis 4 Tangibility of asset has a positive relationship and significant effect with return on asset.

Premium 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. Premium growth also measures the rate of market penetration by insurance companies as it relates to gross written premiums (Kim A. 1995). Proxy for premium growth is the percentage increase in gross written premiums (GWP). The increase in premium growth rate will ensure the growth of the company and increase of its market share. On the other hand, excessive or poorly coordinated growth of premium volume causes or aggravates other risks that may endanger the company's existence (Janotta-Simons, 1999). Empirical findings as they relate to premium growth and insurance company performance have been mixed. Kaguri, (2012); Burca and Batrinca, (2014); Derbali (2014); Kaya (2015); Berteji and Hammami, (2016) found significant relationship between premium growth and performance in their respective studies. Charumathi (2012) found a significant but negative relationship between premium growth and profitability. Mehari and Aemiro, (2013); Kazeem, (2015) found insignificant relationship between premium growth and performance.

Hypothesis 5 Premium growth has a positive relationship and significant effect with return on asset.

Loss ratio The other factor influential financial performance is underwriting risk or loss ratio which reflects the adequacy and efficiency of the insurers' underwriting performance. Loss ratio is a ratio of claims incurred to net earned premium. It is also expressed as underwriting risk. The studies of Abate (2012), Suheyli, Mistire, and Hana (2015) as well as Daniel and Tilahun (2013) found that loss ratio is statistically significant and negatively related with ROA then affects profitability.

Hypothesis 6 Loss ratio has a negative relationship and significant effect with return on asset.

Managerial efficiency The expense management variable, which is defined as the ratio of operating expenses to total income, provides information on variations in operating costs and it used as a proxy to measure the management quality of insurance. Managerial efficiency also has an influential factor on profitability of insurance companies. Beside of

this, the study of Almajali (2012) and cited in (Birhan, 2020) expected at investigating the factors that mostly affect financial performance of Jordanian Insurance Companies. The results showed that the Management competence index have a positive statistical effect on the financial performance of Jordanian Insurance Companies. The researcher recommended that there must be a significant need to have highly qualified employees in the top managerial staff.

Hypothesis 7 Managerial efficiency has a positive relationship and significant effect with return on asset.

Size of the company The company size can be expressed by many variables, such as number of employees, number of branches, or total assets. Most studies use total assets to express the size of the company (Omondi & Muturi, 2013; Burca & Batrinca, 2014; Al-Shami, 2013; Ekezezi, 2015; Malik, 2011). The study of Flaminius (2009) and cited in Sisay (2019), indicated that size is used to capture the fact that larger firms are better placed than smaller firms in harnessing economies of scale in transactions and enjoy a higher level of profits. One of the most important questions underlying bank policy is which size optimizes bank profitability (Athanasoglous 2005). The effect of a growing size of a bank on profitability has been proved positive to a certain extent.

On the other hand, the study in commercial bank determine that by the researcher of Hadush (2015) explained commercial banks profitability in Ethiopian Commercial Banks size represented by banks assets which increased significantly. This increase leads to the profitability of banks; the result implies that larger banks enjoy the higher profit than smaller banks in Ethiopian banking sector because they are exploiting the benefit of economies of scales. For that reason, from the above hypothetical debate it may be pointed that there is a positive relationship between size of a company and profitability as long as the size is manageable and to the optimum level of the company.

Hypothesis 8 Size of the company has a positive relationship and significant effect with return on asset.

Macroeconomic determinants

Growth rate of gross domestic product (GDP) Growth Domestic Product is macroeconomic variable, and tells the total value of goods and services produced in a given nation over a specified period of time usually a year. It is expected to have a positive influence on the insurers' financial performance, since economic growth improves the living standards and the levels of income, increasing the purchasing power of population. Additionally, GDP is one of the most primary macroeconomic indicators used to measure the economic health of a country. Poor economic conditions can worsen the quality of the finance portfolio, thereby reducing profitability. If the economy of the country in terms of GDP grows, the likelihood of selling insurance policies also grows and insurers are likely to benefit from that in form of higher profits (Teklit 2017).

Hypothesis 9 Growth rate of GDP has a positive relationship and significant effect with return on asset.

Inflation rate Inflation is a general rise in the prices of goods and services in a particular country; specifically it leads to a fall in the value of money. If one's country inflation rate in significantly increased the total goods and services of the country is also significantly fall (Suheyli, 2015). Inflation certainly plays a role in insurance and

has adverse impact on many aspects of insurance operations, such as claims, expenses and technical provisions (Daykin, & Pesonen, 1994). On the other hand, the association between inflation rate and insurance companies' profitability relies upon the nature of inflation. Therefore, the expected impact of inflation upon insurers' profitability is subject to further empirical study (Teklit 2017).

Hypothesis 10 Inflation rate has a negative relationship and significant effect with return on asset.

Measurement of variables

1. Definition of dependent variable

Return on asset is defined as the insurance companies before tax profit over total assets. It represents one of the most used methods of quantifying financial performance. Return on asset reflects the ability of insurance's management to generate profits from the insurances' assets, although it may be biased due to off-balance-sheet activities. The return on total assets ratio represents one of the most used methods of quantifying financial performance. It was developed in 1919 by DuPont and it emphasizes the companies' ability to efficiently use its assets (Maria, 2016) cited by Dejen (2017).

2. Definitions of independent variables

The independent variables that were used the econometric model to estimate the dependent variable. To measure the predictor variables of insurance companies' profitability, nine measures are used as independent variables which were identified by the researcher. These were:

Age of the company Number of years since the company starts its operation that computed in a statistical log (Li (2007).

Leverage ratio Leverage is the amount of debt used to finance a company's assets. A company having more debt capital source than equity capital is assumed to be highly leveraged. The leverage in this study was measured by total debt to total equity value of the company (Pandey, 2015).

Liquidity ratio The liquidity ratio measures the firm's ability to use its near cash or quick assets to retire its liabilities. Liquidity ratio is current assets to current liabilities. And also it refers to an enterprise's ability to pay short-term obligations. The term also refers to a company's capability to sell assets quickly to raise cash (Padachi, 2006) and (Chen & Wong, 2004).

Tangibility of asset Tangibility of assets in insurance companies in most studies is measured by the ratio of fixed assets to total assets.

Loss ratio The underwriting risk emphasizes the efficiency of the insurers' underwriting activity and it is measured through the losses incurred divided by annual premium earned. And loss is found by dividing the paid and pending claims by earned premiums and indicates the rate by which earned premiums cover the paid loss. If the loss/premium ratio increases, technical profits of insurance companies are adversely affected (Dogan 2013) cited by Idil (2016).

Premium growth Proxy for premium growth is the percentage increase in gross written premiums. Premium growth also measures the rate of market penetration (Kim et al., 1995).

Managerial efficiency The ratio of operating expense to operating income was used to measure managerial efficiency and the higher the ratio the lower the managerial efficiency.

Company size In this study, company size was measured by total asset in the log value (Flaminio, 2009) and (Malik, 2011) and cited in Sisay (2019) and Kassahun (2020).

Economic growth of GDP It is a macroeconomic variable, and it is expected to have a positive influence on the insurers' financial performance, since economic growth improves the living standards and the levels of income, increasing the purchasing power of population.

Inflation Inflation is a general increase in the pattern of price level of goods and services. It occurs when the prices of goods and services increase over time. Inflation cannot be measured by an increase in the cost of one product or service, or even several products or services. Somewhat, inflation is a general increase in the overall price level of the goods and services in the economy.

Measurement of variables

Variables	Measured by	Expected sign
Profitability (ROA)	Net profit before tax to total assets	NA
Age of the company (AGE)	Log of number of years since the company start operation	Positive
Leverage ratio (LEV)	Total debt to Total shareholder's equity	Positive
Liquidity ratio (LQ)	Current asset to current liabilities	Negative
Loss ratio (LR)	The ratio of total claims incurred to total premium earned	Negative
Asset tangibility (AT)	Fixed asset to total asset	Positive
Managerial efficiency (ME)	Operating expense to operating income	Positive
Company size (CS)	Natural log of total assets	Positive
Growth rate of GDP (GDP)	$GDP(t)-GDP(t-1)/GDP(t-1)$	Positive
Inflation rate (INF)	$INF(t)-INF(t-1)/INF(t-1)$	Negative

Source: Developed by the researcher by reviewing previous research works, 2021

Model specification

In order to achieve the objectives of this research, the panel data regression model which was random effect model under estimation of pooled OLS model employed to identify the relationship between the profitability of insurance companies and explanatory variables like company loss ratio, age of the company, company size, managerial efficiency, leverage ratio, liquidity ratio, premium growth, tangibility of asset, inflation and growth rate of GDP:

$$Y_{it} = \beta_0 + \beta_1(ISF)_{xt} + \beta_2(MEF)_{zt} + \varepsilon_{it},$$

where Y_{it} is a dependent variable for insurance i at time t ; β_0 , β_1 , β_2 and, β_3 represents estimated coefficients including the intercept; $(ISF)_{xt}$ represents the x -th insurance

specific factors at time t ; (MEF) z_t represents the y -th macroeconomic factors at time t , and ε_{it} is the error term.

$$\begin{aligned} ROA_{it} = & \beta_0 + \beta_1 AGE_{it} + \beta_2 AT_{it} + \beta_3 CS_{it} + \beta_4 ME_{it} \\ & + \beta_5 LEV_{it} + \beta_6 LQ_{it} + \beta_7 LR_{it} + \beta_8 PG_{it} \\ & + \beta_9 INF_{it} + \beta_{10} GDP_{it} + \varepsilon_{it}, \end{aligned}$$

where ROA = return on asset of dependent variable profitability; β_0 = constant, $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8, \beta_9$ and β_{10} are parameters to be estimated, I = insurance company, t = the index of time periods, AGE = age of the company, AT = asset tangibility, CS = company size, ME = managerial efficiency, LEV = leverage ratio, LQ = liquidity ratio, LR = loss ratio, PG = premium growth, INF = inflation, and GDP = gross domestic product of economic growth rate.

Conceptual framework

Based on the above theoretical and empirical reviews, the following conceptual framework was developed by the researcher (Fig. 1).

Methods

Study area, period and data source

The study was used secondary data, which are obtained from annual reports of individual insurance companies from 2011 to 2020 in Ethiopia. The advantage of using secondary data includes the higher quality data compared with primary data collected by researchers themselves Stewart and Kamins (1993).

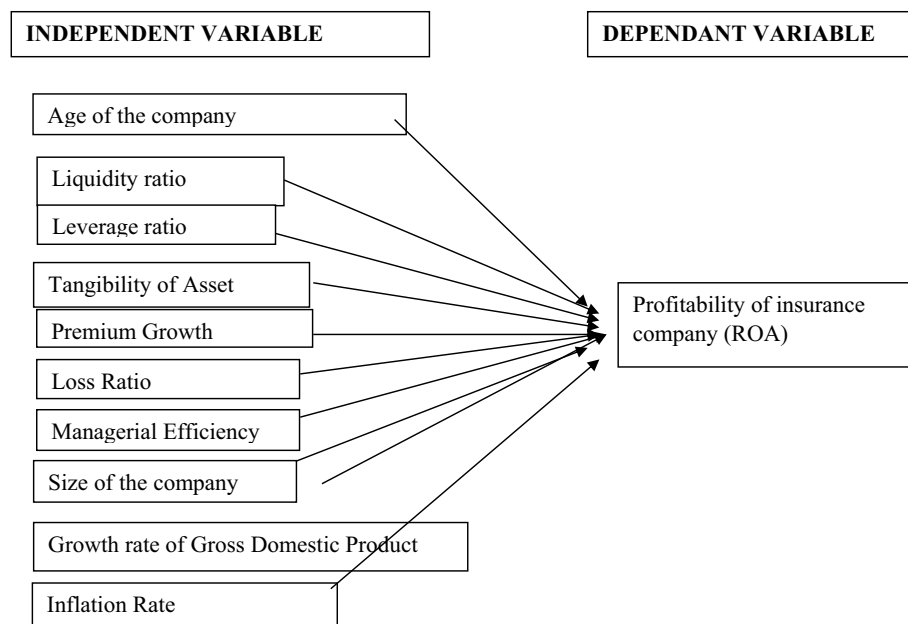


Fig. 1 Conceptual framework

Study design and sampling

In order to identify the extent and nature of cause-and-effect relationships of the variables, this study used both descriptive and casual research design. The study population was 17 insurance companies established and serving with in the specified period of time from 2011 to 2020. Among these all 17 companies only nine insurance companies was selected using purposive sampling method. The study took only 9 insurance companies based on the establishment and adequate audited financial statements in the report of NBE from 2011 to 2020. So, the sample sizes of the nine insurance companies were including: Ethiopian Insurance Corporation, African Insurance Company, Awash Insurance Company, Nib Insurance Company, Nile Insurance Company, Nyala Insurance Company, and National Insurance Company of Ethiopia, United Insurance Company, and Global Insurance Company.

Variable in the study

Dependent variable: Profitability of insurance companies measured by return on asset (ROA). Insurance company, age of the company, asset tangibility, company size, managerial efficiency, leverage ratio, liquidity ratio, loss ratio, premium growth, inflation, gross domestic product of economic growth rate were considered as independent variables in the study.

Data analysis

Data that have been gathered from secondary source were analysed and interpreted by using descriptive analysis, correlation and econometric analysis with the help of STATA v13 and the statistical decision was made at 5% level of significance. Both descriptive statistics and inferential statistics were used for this study.

Linear regression analysis

Regression analysis is a statistical technique for investigating and modelling the relationship between a continuous dependent variable and independent variables. The multiple linear regression models relating the response variable Y_i to several predictors has the form:

$$Y_{it} = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \dots + \beta_k X_{kt} + \varepsilon_{it},$$

where $\beta_0, \beta_1, \dots, \beta_k$ are called the regression parameters, ε_i is the residual term which provides for random variation in Y_i not explained by the X variables.

Results and discussion

Descriptive statistics

The mean value of return on asset ($ROA = 0.115$) considered as common indicator of profitability performance for all insurance companies. That implies on average companies can able to earn 11.5% of profit before tax on each one birr invested in asset. The maximum (0.231) and minimum value of (0.011) shows that between the insurance

Table 1 Descriptive statistics of variables included in the study

Variables	Mean	St. deviation	Minimum	Maximum
Return out asset(ROA)	0.115	0.451	0.011	0.231
Age of company	1.308	0.136	0.954	1.643
Asset tangibility(AT)	0.186	0.120	0.025	0.496
Size of company(SC)	8.174	3.301	1.30	15.44
Managerial efficiency(ME)	2.276	0.729	1.025	4.485
Leverage ratio(LER)	0.673	0.508	0.10	2.681
Liquidity ratio(LQ)	1.133	0.338	0.543	2.297
Loss ratio(LR)	0.673	0.508	0.10	2.681
Premium gross(PG)	0.728	5.622	− 21.70	48.16
Inflation	0.141	0.078	0.074	0.341
GDP	0.102	0.085	0.047	0.650

companies studied most successful company that earned 23.12% of profit before tax on each birr one invested in total asset and feeble performed insurance company had earned 1.11% profit after tax during period covering the study 2011–2020. Also the standard deviation of return on asset 0.045 indicates that the mean value of return on asset was deviated from its mean to up and downward by 4.50%. Table 1 shows that measure of mean, standard deviation, minimum and maximum of one dependent and ten explanatory variables were computed accordingly.

On the other hand, the average age of the Ethiopian insurance companies mean value is 1.308 years with a maximum of 1.643 and a minimum of 0.954, this gap is due to the monopolization of the industry for a long time due to this it has a standard deviation of 0.136 that deviated up and down for the study period. The mean value and standard deviation of asset tangibility of Ethiopian insurance companies that were included in this study has the value of 0.186 and 0.120, respectively. This implies that the sample period of Ethiopian insurance companies that were include in this study they generate revenue from fixed asset 18.58% and the maximum and minimum capacity of revenue generation in the selected Ethiopian insurance companies were 0.025 and 0.496, respectively. So they need moderation in order to generate more assets.

Concerning to the company size explanatory variables, there exist significant variation across the sample insurance companies for the reason that a mean value and standard deviation has 8.174 and 3.300, respectively, and with maximum of 15.44 and minimum of 1.30. For this reason, the varieties of size among insurance companies might have significant impact on profitability of insurance companies. With regard to managerial efficiency of the selected Ethiopian insurance companies, the mean value and standard deviation has 2.28 and 0.729 as well as the maximum and minimum of the managerial efficiency of the selected insurance companies was 4.485 and 1.025, respectively. For this reason, the management of some insurance companies has to employ their capacity to the profitability of their company. In similar fashion, the remaining variables can be interpreted.

Table 2 Regression analysis of determinants of profitability of insurance company from 2011 to 2020 in Ethiopia

Variables	Estimate	Std. error	Zcal	P-value	95% CI
Age of company	0.051	0.024	2.12	0.034	0.004, 0.098
Asset tangibility	0.0156	0.022	0.71	0.477	– 0.027, 0.059
Size of company	0.0049	0.00077	6.47	0.000	0.003, 0.006
Managerial efficiency	0.0116	0.0038	3.04	0.002	0.004, 0.019
Leverage ratio	0.0070	0.0030	2.30	0.022	0.001, 0.013
Liquidity ratio	0.0574	0.0082	6.97	0.000	0.041, 0.074
Loss ratio	– 0.0138	0.0052	– 2.62	0.010	– 0.024, – 0.004
Premium gross	0.0018	0.0005	3.96	0.000	0.0009, 0.003
Inflation	– 0.070	0.0330	– 2.12	0.034	– 0.135, – 0.0054
GDP	0.037	0.0315	1.16	0.245	– 0.025, 0.0983
Constant	– 0.088	0.0289	– 3.05	0.02	– 0.1448, – 0.032

Inferential statistics

In this study regression analysis was employed to identify the determinants of profitability or return out asset of selected insurance company from period of 2011 to 2020 in Ethiopia. Before performing multiple linear regression model univariate analysis was performed to select candidate variables to be included in the final model at 5% level of significance. Ordinary least square method was used to estimate the regression parameters.

Table 2 shows the ordinary least square (OLS) regression results of relationship between the dependent variable (ROA) and independent variables. The coefficient of company age is positive 0.051. It can be interpreted as a one year increase in the age of the company would result in a 5.1 percent increases in the profitability of the company keeping other things unchanged and statistically significant with *P*-value of 0.034 which is below 0.05. This means when company age increased by one year, return on asset (ROA) of sampled Ethiopian insurance companies would increase by 3.4%, the relationship is statistically significant at 3.4% of significance level. The positive relationship between company age and profitability are results of older firms are more experienced, they have enjoyed the benefits of learning, they are not prone to the liabilities of freshness, and they can therefore enjoy superior performance. Older firms may also benefit from reputation effects, which allow them to earn a higher margin on profit. So to conclude, it is expected that as the years of operations increases both their experiences in the sector will increase as well as the company is expected to get enough time to engage in research and development so as to increase its market share leading to increased profitability. This study finding is reliable with previous studies by Hifza (2011) and Derbali (2014) that found a positive and significant relationship between company age and profitability.

In this study, tangibility of asset was positively related to ROA and similarities the appropriate expectation of a positive relationship between tangibility and profitability of insurance companies in Ethiopia. The impact of tangibility of asset on profitability can be positive due to the fact that companies with many tangible assets tend to be

more profitable. The regression results concerning tangibility of assets show that there is no statistically significant relationship between tangibility of assets and profitability of insurance companies in Ethiopia. The regression coefficient is 0.0156, *t*-statistics 0.71 and *P*-value of 0.477 this implies it is greater than 5% confidence interval. This study is supported by studies like Abate (2012) and Derbali (2014) which conclude that the performance of insurance companies is not statistically significant with tangibility. Although the statistical results reveal no significant relationship between the variables, it can be concluded that tangibility of assets still have slight positive impact on profitability of insurance companies in Ethiopia.

The other variable was size of the company, measured in terms of their total asset, is positively and significantly influencing the profitability of the firm. The coefficient obtained from the regression (0.0049) implies that keeping all else constant, a one percent increase in the size of the company causes a 0.49 percent increase in the profitability and *P*-value of the company size is 0.000 which is statistically significance. The finding is in line with both theory and expectation supporting the fact that both economies of scale and market power would be built as size increases. The find is supported by different literatures such as Hailegebrel (2016), Abate (2012), Al-Shami (2008), Chen and Wong (2014) and Swiss (2008) all claiming the existence of positive and significant relationship between size and profitability in the insurance companies.

Managerial efficiency as measured by the ratio of operating expense to operating income. Which means management of operating expenses to income, have great contribution to improve profitability of insurance companies in Ethiopia. The regression result showed that, managerial efficiency influence on profitability is positive relationship and statistically significant level at *P*-value of 0.002. The result of the managerial efficiency indicates that the above Table 2, the managerial efficiency increases by one percent, there is positively increase by 0.0116 (1.16%) in profitability. This means that managerial efficiency and profitability in this study moves in the same directions. This may be due to a constant and consistent growth. Additionally, the level of education of professionals affects the assessment of quality of their competence and thus the company's ability to achieve future success. As indicated in the result Management competency is significantly affect insurance profitably. The higher the qualified employees in the top managerial staff, the better the financial performance of insurance companies. The result is similar with the findings of Mehari and Aemiro (2013), Almajali et al. (2012) and Habtamu Negussie (2012) they conclude managerial efficiency has a strong influence on the profitability.

Leverage is measured by total debt divided by total shareholder's equity. According to the pooled OLS estimation model, leverage was positively related to ROA and this similarities the appropriate expectation of positive relationship between leverage and profitability of insurance companies in Ethiopia. The coefficient of leverage is 0.007 and *P*-value 0.022 happens statistically significant at 5% level of significance. A positive 0.007 estimated coefficient of leverage can be interpreted as; a one percent increase in the leverage of the company would cause an increase in the profitability by 0.7%. It conclude that, the result of this study clearly implies that insurance companies with high leverage

ratio have higher return on assets than with that of low leveraged insurance companies in Ethiopian context. The finding that supported to form other studies Almajali et al. (2012) in Jordan, Boadi et al. (2013) from Ghana, Mehari and Aemiro (2013) in Ethiopia insurance companies studied and found that leverage and profitability have positive relationship. This indicates that an increase in leverage has a positive impact on performance of insurance companies.

Liquidity for insurance companies shows the ability of insurers to pay current liabilities, which have the nature of operating expenses or payment of compensation in case of damage. For the insurer primary sources of liquidity are cash flow from net premiums, investment returns and liquidation of assets (Chen & Wong, 2014). Most studies in this field treat liquidity as a factor affecting profitability, representing it by the current ratio (current assets/current liabilities). Therefore, based on the pooled OLS regression result the coefficient of liquidity measured by current assets to current liability is 0.0574 and its *P*-value is 0.000. Holding other independent variables constant at their average value, when liquidity increased by 1%, return on asset (ROA) of sampled Ethiopian insurance companies would increase by 5.74% and the relationship is statistically significant at 5% of significance level. This positive relationship is not expected but the result is consistent with previous studies which found a positive relationship between liquidity and ROA, for instance, Abate (2012) and Teklit and Jasmindeep (2017) liquidity has negative and significant effect on profitability but on the other hand, Behailu and Wolde (2016), Rahman et al. (2018) and Sumaira and Amjad (2013) conclude liquidity has positive and significant effect on profitability. According to Naveed et al. (2010), Charumathi (2012) and Emine (2015). Therefore, the positive sign implies that the insurers who has higher current ratio will bring higher profits for their firms and increase insurance companies' ability to pay claims incurred to policy holder and creditors by increasing their profitability.

According to Ahmed (2008), insurers will establish premium rates based upon anticipated loss ratio that supports claim payments, administrative costs, profit requirements and an appropriate risk margin for adverse experience. This variable is measured by the ratio of net claim incurred to net premium collected in a year by each insurance company in Ethiopia. The result of the pooled OLS regression regarding loss ratio in this study indicated negative relationship and significant impact at 5% with *P*-value = 0.010 and having coefficient of -0.0138 . On performance of insurance companies which is consistent with the theoretical aspects. By considering other things remain constant, financial performance of insurance companies in Ethiopia will decline by 1.38% because of growing of loss ratio by 1%. The magnitude of the effect is relatively showing low when compared with the study of Tadesse (2013). The loss ratio increases when risk of insured asset increases. But the exposure to the risk units by the insurance companies helps them to manage properly their risk and the future risk even can be predicted possibly considering the law of large numbers. Different empirical findings are consistent with this finding. Study of Melat et al. (2019) indicated that loss ratio showed negative but significant relationship with profitability. Results of the study conducted with dynamic panel analysis of B&H insurance companies' profitability by Pervan et al. (2012) revealed negative and significant influence of claims ratio on profitability. In the study

of determinants of profitability of insurance companies' profitability in UAE, Ahmed (2008) investigated that loss ratio has an inverse relationship with profitability of insurance companies UAE. But, in the study of Adams and Buckle (2003), underwriting risk has positive and significant effect on the performance of Bermuda insurance market.

Regarding the premium growth, the regression result in this research shows the coefficient of growth premium is positive with 0.0018 and it is statistically significant level at 5% with the P -value of 0.000. The positive coefficient of growth premium indicates a direct relationship between growth premium and ROA. It implies that 0.18% of the company causes a one percent increase in the profitability. increase in the premium growth insurance companies underwrite more premium over the years have better chance of being profitable for the reason that they gain return from premium collected when the excessive attention on marketing to grow premiums with a proportionate allocation of resources towards the management of their investment portfolios is given. This finding is supported by other literatures such as Li (2007), Al-Shami(2008), Shiu (2004) and Asrat and Tesfahun (2016) as both researches claim the existence of positive and significant relation between premium growth rate and companies' profitability.

The pooled OLS regression result shows that current inflation is negatively and significantly affects the profit performance of insurance companies with the significance level at 5% (0.034) and coefficient of -0.070 . Thus, the effect of inflation on Ethiopian insurers' profitability is significant. The negative effects of inflation include an increase in the opportunity cost of holding money, uncertainty over future inflation which may discourage investment and savings, and if inflation were rapid enough, shortages of goods as consumers begin hoarding out of concern that prices will increase in the future. This finding supported by different studies have conducted by different researcher, among the researchers Shiu (2004) in United Kingdom and Hailegebreal (2016) conduct the research and concluded that that unexpected inflation exerts a negative impact on insurance companies' performance.

GDP is the most important single macroeconomic indicator of progress in economic development. The result of pooled OLS estimated model in Table 2 indicated that past GDP growth rate positively and insignificantly affects the financial performance of insurance companies in Ethiopia. It is a statistically insignificant at 5% level of confidence with p value of 0.245 and positive coefficient of 0.037. According to this study result, growth rate of GDP in the past ten consecutive period have not a significant contribution for profit generation of insurance companies in Ethiopia but it is indicated theoretically, when economy is at boom, companies become prosperous.

The overall models

In this study, the assumptions of classical linear regression model were assessed. The ordinary least square regression R -squared of the overall model was 0.7666. This indicates that 76.66% variability of profitability of insurance companies in Ethiopia was explained by the within company explanatory variables included in the regression model during period covering 2011–2020. On the other hand, remaining 23.34% of variation in

profitability of insurance company was explained by factors not included in the random effects model.

Conclusion and recommendations

Based on the investigation result of the study shows that age of the company, company size, managerial efficiency, leverage ratio, liquidity ratio, loss ratio, premium growth and inflation rate are statistically significant and have an impact on the profitability of insurance companies in Ethiopia. While the two variables like tangibility of asset and growth rate of GDP statistically insignificant implies that they did not have an impact on the profitability of insurance companies in Ethiopia. On the other hand, the coefficient of loss ratio and inflation have a statistically a negative relationship with return on asset. The remaining variables such age of the company, tangibility of asset company size, managerial efficiency, leverage ratio, liquidity ratio, premium growth and growth rate of GDP have statistically a positive relationship with return on asset. Based on the findings of the study, giving due attention to the sector in line with key factors affecting the profitability will improve the overall performance of the insurance companies in Ethiopia.

Conclusion

The study is generalized as the financial performance of insurance companies is a function of internal and external factors. From these both internal and external variables, the results of this research concluded in this study, the empirical analysis of investigating the factors affecting insurance companies in Ethiopia was conducted using a panel data set consisting of financial data of nine insurers over the period of 2011 to 2020. The appropriate econometric methodology for estimation of variables coefficient was used under random effect regression model after running Hausman test model using STATA v13 software. Next to of this the Breusch–Pagan–Lagrange multiplier test was used based on the test of LM pooled OLS regression to be preferred to analysis. The empirical findings on the effect of insurance profitability in Ethiopia for the sample suggested the following conclusions.

Regarding the dependent and independent variables, it can be concluded that age of the company, tangibility of asset, company size, managerial efficiency, leverage ratio, liquidity ratio, premium growth, and GDP have the coefficient of positive significant impact on return on asset; which means any increase/decrease on the value of these variables leads to an increase/decrease on the profitability of Ethiopian insurance companies proxies by return on asset. While the loss ratio and inflation rate have the coefficient of negative relationship significant impact with the return on asset. This implies that, any increase/decrease on the value of this variables leads to a decrease/increase on profitability of Ethiopian insurance companies.

Appendix

Financial data of the study

Insurance	Year	Age	AT	CS	ME	LEV	LQ	LR	PG	INF	GDP	ROA
EIC	2011	1.54407	0.08	5.89	2.300134	2.1681	1.0872	0.6348	0.66	0.341	0.114	0.0712
EIC	2012	1.5563	0.06	4.95	3.288052	2.819	0.9917	0.7437	0.04	0.135	0.087	0.0511
EIC	2013	1.5682	0.07	5.91	2.414599	2.9125	0.9405	0.4415	1.12	0.081	0.099	0.1366
EIC	2014	1.57978	0.08	6.32	2.289802	3.1453	0.9677	0.3874	0.18	0.077	0.103	0.1652
EIC	2015	1.59106	0.07	6.952	2.989505	3.9307	0.9849	0.2456	0.2	0.074	0.104	0.1894
EIC	2016	1.60206	0.07	7.56	3.296225	4.7023	2.1079	0.1326	0.01	0.089	0.08	0.1955
EIC	2017	1.61278	0.06	7.965	3.318316	4.7601	1.3224	0.1353	0.11	0.099	0.102	0.1988
EIC	2018	1.62325	0.079	8.53	3.305741	4.3892	2.0012	0.1012	0.37	0.168	0.077	0.2001
EIC	2019	1.63347	0.083	8.02	3.188666	4.5921	1.0265	0.1553	0.38	0.169	0.07	0.1999
EIC	2020	1.64345	0.069	8.963	2.475541	1.9293	2.015	0.100	0.41	0.171	0.65	0.2312
NICE	2011	1.14613	0.06	5.64	1.780005	1.8118	0.9921	0.9256	0.35	0.341	0.114	0.0475
NICE	2012	1.17609	0.05	1.862	2.097202	1.8323	1.1206	0.9881	-0.89	0.135	0.087	0.029
NICE	2013	1.20412	0.04	6.523	1.070318	1.7887	1.0525	0.1231	48.16	0.081	0.099	0.1743
NICE	2014	1.23045	0.05	5.14	1.243551	1.8603	1.2023	0.7365	2.94	0.077	0.103	0.0613
NICE	2015	1.25527	0.05	5.84	1.123851	1.9571	1.1232	0.7265	0.09	0.074	0.104	0.0695
NICE	2016	1.27875	0.05	11.02	1.043121	1.6785	1.208	0.2365	0.1	0.089	0.08	0.1202
NICE	2017	1.30103	0.04	11.21	1.02523	2.1589	1.235	0.2001	-0.59	0.099	0.102	0.1231
NICE	2018	1.32222	0.043	12.201	1.989385	2.1406	1.3522	0.1996	2.85	0.168	0.077	0.1323
NICE	2019	1.34242	0.126	11.11	1.189443	1.9961	1.3255	0.1999	3.01	0.187	0.069	0.1322
NICE	2020	1.36173	0.053	12.42	1.198334	2.1272	1.4322	0.1112	2.81	0.199	0.65	0.135
AwashIC	2011	1.20412	0.34	8.031	1.820544	1.3623	0.8322	0.5641	0.64	0.341	0.114	0.0904
AwashIC	2012	1.23045	0.23	6.841	2.430776	1.47	0.7846	0.6325	0.4	0.135	0.087	0.0795
AwashIC	2013	1.25527	0.21	6.821	1.866758	1.3482	0.8507	0.6344	0.15	0.081	0.099	0.0793
AwashIC	2014	1.27875	0.25	13.85	2.12017	2.1395	0.8859	0.2131	0.81	0.077	0.103	0.1485
AwashIC	2015	1.30103	0.26	9.011	3.379792	1.8366	0.8609	0.3212	-0.08	0.074	0.104	0.1022
AwashIC	2016	1.32222	0.26	10.51	2.068209	1.3253	1.3947	0.3001	0.05	0.089	0.08	0.1161
AwashIC	2017	1.34242	0.23	11.325	2.215805	0.9538	1.3222	0.2598	0.16	0.099	0.102	0.1235
AwashIC	2018	1.36173	0.257	11.41	1.896306	2.6718	0.9633	0.2456	0.31	0.168	0.077	0.1252
AwashIC	2019	1.38021	0.249	12.432	1.894135	3.0775	0.8965	0.2312	0.35	0.175	0.067	0.1352
AwashIC	2020	1.39794	0.261	13.625	2.475541	3.2945	1.0022	0.1658	0.37	0.18	0.055	0.1452
AfricaIC	2011	1.23045	0.3	4.35	1.858009	2.3498	0.8889	0.6325	2.32	0.341	0.114	0.0579
AfricaIC	2012	1.25527	0.41	4.233	1.797315	2.6977	0.8271	0.6986	0.37	0.135	0.087	0.053
AfricaIC	2013	1.27875	0.36	4.325	1.682246	2.2173	0.6717	0.6395	0.2	0.081	0.099	0.0532
AfricaIC	2014	1.30103	0.32	2.325	1.903552	2.827	0.5431	0.9689	-0.09	0.077	0.103	0.0111
AfricaIC	2015	1.32222	0.3	7.635	2.047082	3.3161	0.6317	0.7695	-1.03	0.074	0.104	0.0804
AfricaIC	2016	1.34242	0.34	6.223	2.416116	2.7727	1.0724	0.8625	-21.7	0.089	0.08	0.072
AfricaIC	2017	1.36173	0.31	7.333	1.725705	2.2512	0.5885	0.6598	0.61	0.099	0.102	0.083
AfricaIC	2018	1.38021	0.413	7.455	1.491366	2.2794	0.8655	0.6963	-0.39	0.168	0.077	0.0855
AfricaIC	2019	1.39794	0.359	8.635	1.535786	0.8276	0.7856	0.5222	0.23	0.167	0.066	0.0965
AfricaIC	2020	1.41497	0.341	8.888	2.852663	0.9203	0.8555	0.4021	0.35	0.177	0.054	0.0999
NyalaIC	2011	1.20412	0.26	9.001	2.649002	3.6928	0.9823	0.3255	0.25	0.341	0.114	0.1011
NyalaIC	2012	1.23045	0.19	8.325	3.20061	3.0177	1.0176	0.1101	0.23	0.135	0.087	0.1591
NyalaIC	2013	1.25527	0.17	9.325	2.706832	2.2457	1.0995	0.1001	0.85	0.081	0.099	0.182
NyalaIC	2014	1.27875	0.14	15.32	2.706832	2.7908	1.1423	0.1021	1.27	0.077	0.103	0.1647
NyalaIC	2015	1.30103	0.11	13.23	2.354312	2.1036	1.0176	0.2355	-0.48	0.074	0.104	0.1434

NyalaIC	2016	1.32222	0.09	11.36	2	2.3909	1.0018	0.3321	0.18	0.089	0.08	0.1227
NyalaIC	2017	1.34242	0.08	11.47	2.519493	2.9691	1.0525	0.3215	0.11	0.099	0.102	0.1258
NyalaIC	2018	1.36173	0.143	3.3479	2.536289	4.0438	1.1444	0.9907	1.84	0.168	0.077	0.1268
NyalaIC	2019	1.38021	0.105	3.5777	2.17874	3.7648	1.3654	0.9908	1.92	0.165	0.065	0.1351
NyalaIC	2020	1.39794	0.114	11.421	2	4.2048	1.2322	0.9998	2.01	0.169	0.049	0.1255
NileIC	2011	1.14613	0.18	12.232	1.150521	4.3138	1.4275	0.7898	0.55	0.341	0.114	0.1379
NileIC	2012	1.17609	0.13	8.622	2.097202	3.5574	0.9642	1.2101	-0.16	0.135	0.087	0.098
NileIC	2013	1.20412	0.15	9.012	1.739204	3.3439	1.0891	0.9689	0.5	0.081	0.099	0.102
NileIC	2014	1.23045	0.16	9.851	1.835605	2.0968	1.1108	0.8695	0.02	0.077	0.103	0.1096
NileIC	2015	1.25527	0.15	12.861	2.085139	1.4657	1.3229	0.53625	0.08	0.074	0.104	0.1397
NileIC	2016	1.27875	0.25	7.401	2.076937	1.6894	0.9138	0.9868	0.27	0.089	0.08	0.0851
NileIC	2017	1.30103	0.29	7.421	1.670691	2.7954	0.9121	0.8695	-0.25	0.099	0.102	0.0853
NileIC	2018	1.32222	0.183	8.512	1.255812	2.7977	0.9985	0.7895	1.23	0.168	0.077	0.0963
NileIC	2019	1.34242	0.148	8.4432	2.492898	3.017	0.9925	0.7785	1.01	0.165	0.064	0.0955
NileIC	2020	1.36173	0.025	10.112	4.485342	2.8517	1	0.3625	0.34	0.176	0.055	0.1123
GlobalIC	2011	1.14613	0.45	4.731	1.619515	2.7433	0.8795	0.9263	0.22	0.341	0.114	0.0584
GlobalIC	2012	1.17609	0.35	2.521	1.823034	2.3231	0.7952	0.9989	-0.3	0.135	0.087	0.0364
GlobalIC	2013	1.20412	0.27	1.3	1.322677	2.0163	0.916	1.321	0.19	0.081	0.099	0.0203
GlobalIC	2014	1.23045	0.23	4.21	1.243551	1.383	1.135	0.1298	2.09	0.077	0.103	0.1532
GlobalIC	2015	1.25527	0.18	5.301	3.14908	1.3909	1.3519	0.1212	0.22	0.074	0.104	0.1603
GlobalIC	2016	1.27875	0.15	4.521	3.363516	1.7299	1.6279	0.2314	-0.11	0.089	0.08	0.1364
GlobalIC	2017	1.30103	0.12	4.58	3.178252	1.3136	1.6322	0.2211	0.000	0.099	0.102	0.1385
GlobalIC	2018	1.32222	0.496	5.102	2.853443	1.486	1.9855	0.2111	-0.35	0.168	0.077	0.1401
GlobalIC	2019	1.34242	0.294	6.25	2.098243	1.3584	1.999	0.2101	0.3	0.168	0.066	0.1552
GlobalIC	2020	1.36173	0.147	7.42	3.24519	1.4706	2.2966	0.2001	0.41	0.171	0.047	0.1653
UnitedIC	2011	1.23045	0.08	10.31	1.485314	1.5181	1.1695	1.8642	0.8	0.341	0.114	0.1142
UnitedIC	2012	1.25527	0.07	7.65	3.816518	1.8189	1.0893	2.6811	-0.11	0.135	0.087	0.0874
UnitedIC	2013	1.27875	0.09	11.08	2.240658	1.1262	1.2454	2.3625	0.98	0.081	0.099	0.1219
UnitedIC	2014	1.30103	0.33	5.25	2.483816	1.5056	1.6684	1.3451	0.52	0.077	0.103	0.1732
UnitedIC	2015	1.32222	0.45	5.354	3.666558	1.6284	1.2112	1.4115	0.01	0.074	0.104	0.1412
UnitedIC	2016	1.34242	0.33	12.12	2.896802	2.2238	1.2015	1.5012	0.14	0.089	0.08	0.1306
UnitedIC	2017	1.36173	0.43	12.55	2.423293	1.6899	1.2866	1.4562	-0.23	0.099	0.102	0.1342
UnitedIC	2018	1.38021	0.425	14.51	2.083944	1.8721	1.3952	1.3212	0.25	0.168	0.077	0.1562
UnitedIC	2019	1.39794	0.235	15.21	2.189389	1.8392	1.4355	1.2315	0.28	0.165	0.063	0.1632
UnitedIC	2020	1.41497	0.081	15.44	3.746599	1.639	1.4625	1.1235	0.65	0.169	0.067	0.1655
NibIC	2011	0.95424	0.11	6.66	2.073446	1.2681	0.8797	1.112	0.27	0.341	0.114	0.0776
NibIC	2012	1.000	0.09	7.884	2.002086	1.1206	0.8999	0.9562	0.3	0.135	0.087	0.0899
NibIC	2013	1.04139	0.09	7.748	2.758724	1.0525	0.8693	0.9652	0.26	0.081	0.099	0.0885
NibIC	2014	1.07918	0.09	10.011	2.733054	1.2023	1.0518	0.5231	0.26	0.077	0.103	0.1112
NibIC	2015	1.11394	0.14	10.165	2.698829	1.1232	1.1079	0.1235	-0.04	0.074	0.104	0.1127
NibIC	2016	1.14613	0.15	6.459	2.791039	1.208	0.9807	0.9985	0.08	0.089	0.08	0.0756
NibIC	2017	1.17609	0.15	7.62	2.000	1.161	1.0255	0.9658	-0.07	0.099	0.102	0.0873
NibIC	2018	1.20412	0.159	2.44	2.000	1.0833	0.8236	1.3521	-0.06	0.168	0.077	0.0355
NibIC	2019	1.23045	0.139	5.74	1.567997	0.999	0.9036	1.0214	0.21	0.169	0.064	0.0685
NibIC	2020	1.25527	0.045	5.41	3.472338	0.9361	0.8122	1.1121	0.28	0.172	0.057	0.0652

Abbreviations

AT	Asset tangibility
SC	Size of company
GDP	Gross domestic product
LEV	Leverage ratio
LQ	Liquidity ratio
LR	Loss ratio
ME	Managerial efficiency
OLS	Ordinary least square
PG	Premium gross
ROA	Return out asset

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Author contributions

AT wrote the proposal, collected data from insurance companies and analysed the data in consultation with the YW and ZB. YW and ZB edited the document and gave critical comments. All authors reviewed and consented to the last version of the manuscript.

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Availability of data and materials

The datasets analysed during the current study are available from the corresponding author upon reasonable request.

Declarations

Competing interests

The authors declare that they have no competing interests.

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