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Forecasting the Prospect of the Future Business Growth and Detecting Distorted Earnings in Public Insurance Industry: The Voice from Indonesia

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ABSTRACT
Insurance firms nowadays become a highlight for society after some cases of payment failure in Indonesia occur such as Jiwasraya, and Bumi Putera. It may decrease public trust in the prospect of the insurance business in the future. This research aims to demonstrate the future growth of the insurance business performances in Indonesia and detect distorted earnings. Afterward, the future growth yielded by firms between distorted and non-distorted earnings is tested in this research. The sample was public insurance firms in Indonesia. Financial data were analyzed using Autoregressive Integrated Moving Average (ARIMA) for forecasting future growth, meanwhile, the nexus between variables was tested using a logistic regression model of panel data. The result found that the prospect of insurance firms will be growing with positive and negative values. They will pull through the ups and downs of business over the period of 2021 to 2027. This research further detected the distorted earnings in the insurance business performances and found that the future growth yielded by firms with distorted earnings has no difference from non-distorted earnings. The finding is addressed to the insurance companies as input. They need to prepare their business from now by increasing their performance. This finding is considered as the means of rebuilding their trust in the growth of the insurance business and providing the answer to society regarding the insurance business prospect in the future.

Keywords: ARIMA, Earnings, Growth, Insurance.

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1. INTRODUCTION

The insurance industry must attempt to increase its performance in order to be equal to the banking industry's growth. Insurance firms have a low market capitalization in Indonesia in the financial industry and Setiadie (2019) found that their market structure is the type of perfect competition. They must only compete with the same industry to gain more profit. Wartaekonomi (2018) reported that the level of trust in insurance is still low and its penetration in the market industry is still under 3%. Setiawan (2013)stated that the insurance industry actually has a big potential to grow through the addition of an understanding of trust in society.

Insurance firms in the beginning period of 2019 showed positive growth. Financial Services Authority known as OJK (2020a) infers that its economic growth has a positive value and remains good. It noted 5.91 percent in the total assets from 862 million Rupiah in 2018 to 913 million Rupiah in 2019. This authority ensures that insurance firms have good prospects in the future. In addition, OJK (2020b) also noted economy in Indonesia through GDP over the period of 2017-2018 increased by the value of 9.20 percent from 13.587 million Rupiah to 14.837 million Rupiah, while the premium ratio on the GDP decreased by approximately 0.08 percent from 3 percent to be 2.92 percent. As reported in Kompas (2020) that during the last five years, the insurance performance has a positive range as presented through data of OJK over the period of 2014-2019. Here's Table 1 regarding the growth of insurance in assets and investments over the last three years from 2018 to 2020. However, is it true that the growth of insurance has recently been considered attractive and trusted by society?.

Based on the report of CNCB (2019), stocks in the public insurance business look less attractive because the level of liquidity and market capitalization is low. As reported in Kontan.co.id (2021), an average of firms had fewer liquid stocks and the COVID-19 pandemic might also be a determinant. Many customers take premiums, resulting in an increase in claim potential. In this regard, the trust in the insurance performance in the midst of society leads this research to be conducted. The perception regarding the insurance business determines the investment decision (Ari & Astiti, 2014). In the eyes of the public, the insurance business dropped off the level of trust, even since there was a case of payment failure on the customers in Jiwasraya and Bumi Putera Firms resulting in the decline of expectations on the prospect of insurance performances. Detikfinance (2020) reported that one of the firms more complained about customers is the insurance industry as noted by Consumer Protection Agency that insurance services are dominated by claim problems. This circumstance implies that the insurance business has problems in terms of less productive growth nowadays, whereas the emergence of the growth in the insurance business reported by OJK seems healthy as shown in Table 1.

Previous research related to the future growth in the insurance business has been studied by some scholars (Adnyana & Firdaus, 2020; Rahim, 2013; Setiadie, 2019). Adnyana & Firdaus (2020) found that some insurance firms are detected to

Table 1. **The Rate of Growth**

Period	Asset	Investment
2018	1,249.05	1,067
2019	1,357.14	1,134
2020	1,450.32	1,224
The rate of growth 2018-2019	8.65%	6.37%
The rate of growth 2019-2020	6.87%	7.96%

Source: Processed Data

have financial distress potential. Under the literature review approach, Rahim (2013) concluded that insurance firms look healthy and strong as well as can contribute to economic growth in the future five years. Understanding the concept of research, growth projections have not decomposed empirically and tested causally. In turn, Setiadie (2019) analyzed the market share and found that the insurance industry has big potential to grow where its prospect in Indonesia is able to reach a higher market share and achieve better financial performance. Unlike previous studies, we further conduct a forecast regarding the prospect of the level of growth in the future through an Autoregressive Integrated Moving Average (ARIMA) Model. Besides, we also identify the actual or fraudulent earnings performance in the public insurance industry. Since Santosa & Ginting (2019)the Beneish M-Score, is capable of being one of the tools to see financial report fraud occurring in the business world. This is interesting to study considering that many companies in the Financial Services Authority (OJK assumed that Beneish's M-Score cannot be effectively used for firms under OJK control, we utilized the data from public insurances listed in Indonesia Stock Exchange. We believe our findings can rebuild the paradigm of society regarding the prospect of the insurance business in the future. We also contribute theoretically to the body of knowledge that the forecast of growth of the insurance business links quality and certainty in the future.

The following section in this research describes the literature review and methodology. Results and discussion are presented in section 4. We end this research in a conclusion containing implications and a future study in section 5.

2. LITERATURE REVIEW AND HYPOTHESIS

Insurance Concept and its Growth in Indonesia

Insurance firms have positioned themselves as supplementary to the need of society. They become an important element of risk and management strategies for individuals and social groups (Puspitasari, 2011). Insurance is a service business providing the contractual relationship in which the firm agrees with the insured party as the policyholder against the payment of premiums in the monetary provision on behalf of the insured party after a formal claim is filed. Insurance firms are the party providing full guarantees to customers in accordance with the agreement. In Indonesia, the insurance business began to develop in the 1980s with the emergence of AIA Financial, Allianz, Avrist AXA Mandiri, and Prudential (Ariadi, 2013). They could grow because their customers felt the benefit such as self-protection and investment service. The available products in the insurance business are not only limited to the type of life and health insurance but general insurances with types of products are also marketed, for example, fund insurance, retirement fund insurance, and vehicle, and property insurances.

Risk-Based Capital is one of the size strategies that is necessary with the help of the use of regulations in measuring the level of economic feasibility of the coverage organization (Sula, 2004). Creating new and more innovative products in accordance with the need of customers also serves as a strategy, so people are interested to join. It is due to enhance choices and consideration for them in enjoying the insurance services. They will obtain the services in terms of protection for various risks and losses that will behalf them at any time. The increase of insurance business in the market industry leads them to compete in providing services according to the specifications of the resulting product types. Based on data released by OJK (2020b), insurance entities have been considered to have the best growth patterns (Ibnu & Soenhadji, 2005). This condition is certainly believed by investors that the role of the insurance business is pivotal in supporting the national development process. Obtaining large amounts of long-term funds then

used as funds in the national development is a contribution provided by the insurance industry. If their trust in the insurance services is well created, the growth of the insurance business will increase. The more people who want to be protected against various risks faced in the future, the more synergies the relationship between the insurance business and economic growth.

Hypothesis Development

We build this research under the tenet of fraud theory. The elaboration of the theory has been developed in various perspectives. In the development, the emergence of various types of fraud model cannot be separated from the basic theory of fraud made by Cressey (1953) demonstrating three causes of fraud including pressure, opportunity, and rationalization. They are described in fraud triangle. Companies will have opportunity to cheat if they suffer financial distress. Afterwards, they give a rational reason as a form of self-defense. Fraud triangle has been utilized by prior scholars and found that it always exists in various areas. In this case, business insurance can be related to fraud which is able to be an intentional deception committed by the insured party as a policyholder. The deception can also be committed by insurance agents or firms to the insured party. The purpose of fraud is to tackle the opportunity and avoid pressure, particularly from external parties. Claims on fraudulent insurance can cause great losses for insurance companies resulting in premiums going up (Hibbeln et al., 2014; Kirlidog & Asuk, 2012). Some insurance sectors are vulnerable to fraud, namely health, workers' compensation, and car insurance.

Furthermore, fraud can also be undertaken by insurance agents, hospitals or doctors. Insurance businesses are generally able to do twisting and churning practices, namely the action of persuading policyholders to change the specification of existing policies or replace old policies with new policies. They are prone to fraud by transferring premiums and churning fees. This practice certainly has an impact on the potential loss of customers who will reduce cash value so that the policy is worthless. When this condition occurs, the additional funds paying for the new policy allow it unavailable so that the policyholder does not obtain enough funds even with no funds at all.

Information asymmetry underlies the existence of fraud. In implied contracts, access to explicit information is usually limited to one party transacting. Information providers often have a clear incentive to conduct information asymmetries flagging fraud. Information about the nature of the risk borne by prospective customers is generally categorized in personal information. This clearly illustrates the misstatement of the claim information. A claim will be fraudulent if there are material facts hidden and engineering, for example, a customer does not disclose the disease suffered already exists and provides information that states healthy when registering as a policyholder. The purpose is that the company quickly pays for the customer's policy. Another most common way is to make false insurance claims to fabricate the value of claims that do not match the actual value.

Insurance fraud frequently brings losses for both the company and customers. The reputation of the business can be bad because of the decrease in the stigma of public trust, while fraud claims will be brought into the legal realm and considered a criminal offense and in the end, the customer does not benefit at all. Viaene & Dedene (2004) stated that the essence of insurance fraud lies in the existence of information asymmetry between transaction parties and violations of utmost good faith where the insured and insurer must reciprocally be in the insurance agreement by not hiding the clear and correct information needed by each party. The existence of information asymmetry that makes a claim can be rejected. Customers must also have knowledge that is not opportunistic by

providing information that is in accordance with the agreement information. On the other hand, people as prospective customers can get accurate signals about the products offered by the company. There are many insurance companies that offer diverse products with different quality. The company's track record is a strong signal of marking the company's performance. The governance of insurance companies is also a complementary signal to their business going concerns.

Asymmetry of the company's product quality information can occur if the company makes its performance seem good quality to external users. As a result, the public assesses the company well through these signals, whether the quality of the price offered, or the profit of the claim is obtained later by the customer. This certainly gives uncertainty about whether the insurance company can afford to pay the claim or not. Likewise, the company's track record and the quality of performance owned are the best forms of signal to choose the best insurance service, but profit tendency is a fundamental signal in assessing the growth of the insurance business. Insurance performances may be considered deviant due to pre-regulated fraud, driving a decline in the growth level of insurance performance.

Fraud can be committed situationally depending on the tendency of financial stability. Abbas (2017) found that the more depressed the company, the more driven the company is to commit fraud. When companies are depressed, they are more pressured to commit profit fraud and future growth will be low. Otherwise, the future earnings growth yielded by nonfraudulent firms will tend to be greater than fraudulent firms. Thus, the research hypothesis is that " non-distorted insurance earnings have the magnitude of the future business growth greater than distorted earnings".

3. METHODS

The sample was public insurance firms listed on Indonesia Stock Exchange. We collected 15 issuers enrolled over the period of 2013 to 2020. The observation period was seven years from 2013-2019. We required data in 2020 due to the measurement of variables (period t+1). After eliminating some samples with unavailable data, we finally obtained 10 firms.

Variables in this research were insurance growth (GROWTH) and fraud (FRAUD). Past growth can provide valuable information to estimate future growth. The estimated current growth rate is measured using the growth of insurance in earnings. Current growth (t+1) is a comparison between the difference of EBIT one year ahead (t+1) with present EBIT (t), and present EBIT (t).

$$\text{Current growth}_{(t+1)} = EBIT_{t+1} - EBIT_t / EBIT_t$$

Current Growth is the current growth of performance in Earnings Before Income Tax (EBIT). $EBIT_t$ is earnings before income tax in the base period (t) and $EBIT_{t+1}$ is earnings before income tax in the one period ahead (t+1). The greater profit obtained from year to year reflects that the company has financial strength that is able to grow larger and is considered healthy during its long-term operation.

For forecasting the future prospect, we used the rate of present growth including earnings before income tax in prior one period ($EBIT_{t-1}$) measured as follows.

$$\text{Growth}_t = EBIT_t - EBIT_{t-1} / EBIT_{t-1}$$

We employed Autoregressive Integrated Moving Average (ARIMA) because it is autoregressive and can estimate future values based on past values (Donatelli et al., 2022; Nanlohy & Haumahu, 2021; Nielsen, 2004; Salman & Kanigoro, 2021; William W. S. & Lütkepohl, 2005; Wulff, 2017; Ziegel et al., 1995). The equation model of ARIMA is written as follows.

$Xt = u + \emptyset_1 X_{t-1} + e_t - \theta_1 e_{t-1}$ AM & MA

$(1-\emptyset_1\beta)X_t = u + (1-\emptyset_1 \beta) e_t$ ARIMA (1,0,1)

$(1-\beta)(1-\emptyset_1\beta)X_t = u + (1-\emptyset_1\beta) e_t$ Difference in ARIMA

Where X is variable, μ' is constant, Ø and θ are autoregressive and moving parameters respectively, and (1-β) is the

difference in ARIMA. Before forecasting the variable, data should be identified by checking the stationary and establishing the fit ARIMA (Wheelwright et al., 1978). Some prior studies used ARIMA in predicting the business sector sector (Almasarweh & Wadi, 2018).

We analyze the variable of earnings in the measurement of the M-Score formulated by Beneish (1999). It is a mathematical model used to detect fraud in financial statements (Mehta & Bhavani, 2017; Tarjo & Herawati, 2015). We do not term fraud as used by most research. In this research, we mention it as a distortion of earnings performance. In this regards, we considers modified M-Score with five ratios as suggested by scholars (Kaur et al., 2014; Mavengere, 2015). It confirmed more accurately to identify distorted earnings than seven ratios (Roxas, 2011). If M-Score obtains a value more than -2.22, firms will deviate the earnings from the actual value. We give 0 for them, and otherwise 1 for firms obtaining less than -2.22. The formula of M-Score is written as follows.

M-score= -6.065+0.823 DSRI+0.906GMI+0.593AQI+0.717SGI+0.107 DEP

Where, M-Score denotes the distortion in financial statements, DSRI denotes Days Sales in Receivables Index, GMI denotes Gross Margin Index, and AQI, SAGI, and DEPI are Asset Quality Index, Sales Growth Index, Depreciation Index respectively.

As stated in Gujarati (2015), panel data were tested by the fit model. We test the research hypothesis through the panel data logistic regression with given 1 for non-distorted earnings and 0 for distorted earnings. The equation model is written as follows.

$$Logit\ M\text{-}score = a + \beta\ GROWTH + \varepsilon$$

4. RESULTS AND DISCUSSION

Prospect of the Future Growth and Fraud in Public Insurance Industry

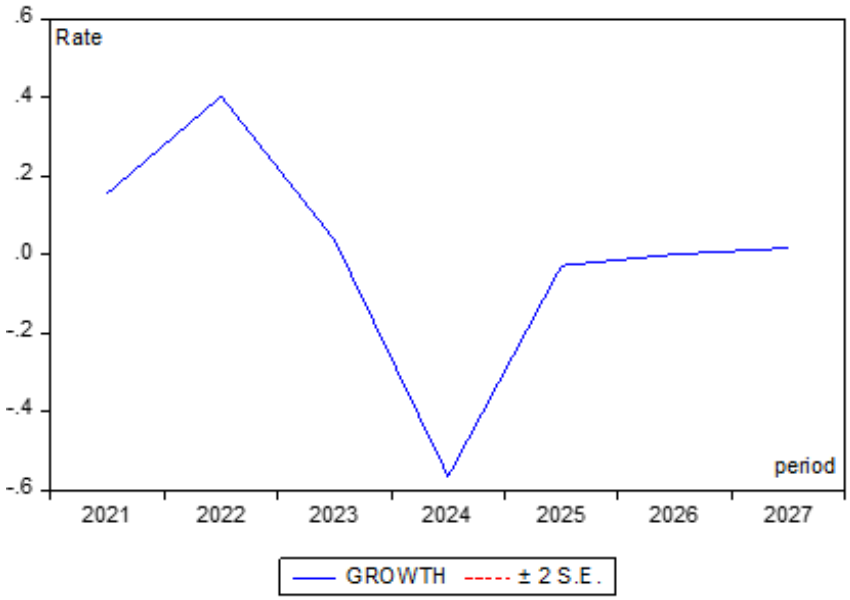
The result of the fit model of ARIMA obtains the probability value at level 1% in AR (7) and MA (2), so this research uses ARIMA (7,1, 2) for the future 7 years over the period of 2021 to 2027. The result of forecasting insurance growth is shown in figure 1. During the future three periods of 2021 to 2023, insurance firms will still gain a positive value from the growth. Entering the period between 2024 and 2025, the negative values will be suffered from -0.566 and -0.028. In the period of 2026-2027, they will be back to rise slowly with positive values.

The equation of distorted earnings through modified M-Score was regressed to see the significant effects of the five ratios and find the simultaneous effects. We regress it on all effect models, pooled least squares with its common effects, fixed effect model, and random effect model. In Table 2, goodness of fit test is generated in all effect models. In the partial tests, all indicators of M-Score have significant effects at the 1% level, while Adjusted R-squared values obtain 99% in the determination coefficient, and F-statistic is significant at the 1% level. Thus, the indicator of five ratios provides a fit to the M-Score model. This research further runs the effect of actual performance through M-Score on future growth. In Table 3, the result of the effect model selection is presented. It runs PLS, FEM, and REM. The Chow test shows significance at 0.082, so the Lagrange Multiplier (LM) is analyzed. The result obtains 0.142. Accordingly, PLS is the fit model in this research. In Panel B, PLS with common effect model is presented and meets the normality through Jarque-Bera value of 3.893 significant at the 0.124 level more than 5% level and heteroscedasticity using Breusch Pagan LM at the 0.0864 level more than 5% level. The result of PLS shows the positive effect of M-Score on GROWTH. It indicates that actual earnings performance has a positive effect on insurance growth. After the positive effect between variables is obtained, PLS with GLS weights and Robust Least Squares are then run with the purpose of checking robustness in the data. The results remain consistent. Therefore, this research makes a decision that M-Score including the actual and distorted performances affects positively

future insurance growth. In this regard, the increase of future growth is determined by the level of the present insurance business performance.

Because M-Score obtains a fit model with five ratios as presented in Appendix 1, we further detect the distorted earnings. Appendix 2 shows descriptive statistics indicating that distorted earnings tend to be detected each year. Financial statements with distorted and non-distorted earnings under the proxy M-Score obtain 26% and 74% respectively. We totally obtain 18 financial statements with a value of more than -2.22 and 52 financial statements with a value of less than -2.22. We trace fraudsters' mean index each index. According to Warshavsky (2015), fraudsters' mean index is 1.46 for DSRI, 1.19 for GMI, 1.25 for AQI, 1.60 for SGI, and 1.07 for DEPI. We find fraudulent performances in the mean index of sales on the receivable (DSRI) and gross margin (GMI). The insurance business actually suffers a decline in gross

Figure 1. **Forecasting Insurance Growth in EPS up to 2027**



2021	2022	2023	2024	2025	2026	2027
0.157	0.404	0.037	-0.566	-0.028	0.001	0.017

Source: Processed Data, 2022

Table 2. **M-Score Index with Five Ratios**

Variable	Pooled Least Square		Fixed Effect Model		Random Effect Model	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Constant	-6.110	-161.107***	-6.103	-157.208***	-6.110	-159.295***
DSRI	1.003	623.925***	1.001	550.168***	1.003	616.904***
GMI	0.999	1323.635***	0.999	1139.760***	0.999	1308.741***
AQI	1.084	16.667***	1.072	16.089***	1.085	16.479***
SGI	0.995	386.685***	0.996	348.420***	0.995	382.334***
DEPI	1.001	530.947***	1.000	472.809***	1.001	524.972***
R-Squared	0.999		0.999		0.999	
Adjusted-R-squared	0.999		0.999		0.999	
F-statistic	668312.6***		233342.2***		668312.6****	

Source: Processed Data, 2022

margin. The magnitude of pressures to show good performances is a motive to distort the margin. Underwriting revenues tend to decrease along with the increase in claim expenses, so firms manage the index of gross margin of revenues. Besides, in the revenues on receivables, firms tend to make changes to the premium policy.

DISCUSSION

The Future Business Growth Between Non-Distorted and Distorted Earnings

Having obtained the number of earnings performances, we then employ the variable of M-Score in a logit measurement model. It is given the value 1 for non-distorted and 0 for distorted. We run the logistic regression to test the hypothesis that "*non-distorted earnings have the magnitude of the future business growth greater than distorted earnings*". The result is shown in Appendix 3. In Panel A, three effect models are presented, PLS, FEM, and REM. The Chow test shows 3.22 significance at the 0.01 level, while the Hausman value shows 0.712 not significant at the 0.01 level. Consequently, we must use Lagrange Multiplier (LM) and its result is 5.93 significant at the 0.01 level. It means the result of REM is used to analyze the hypothesis. We also check robustness in the research model through robust regression as presented in Panel B. The dependent variable of GROWTH shows an insignificant value at all levels both REM and Robustness test. Therefore, the research hypothesis is rejected.

M-Score has a positive effect on insurance growth (Appendix 1). Earnings play a pivotal role in leading the increase of the level of future growth. Does the future growth yield between fraudulent and nonfraudulent performances differ? Based on Appendix 3, the hypothesis is rejected. Non-fraudulent firms have no difference in future growth from fraudulent firms. We initially hypothesized that nonfraudulent firms with an M-Score less than -2.22 can show a magnitude of growth in the future greater than firms with an M-Score more than -2.22, but the result is not significant. As a result, the future earnings growth yielded by nonfraudulent firms tends to be similar to fraudulent firms. Asymmetry of performance quality information is generated by insurance companies. They make their performance seem to have good quality in the eyes of external users. Companies tend to seem to provide good product quality and performance for several periods, and it has been anticipated in the future so that business growth does not have a decreasing impact. Thus, the earnings between distortion and non-distortion have provided the same future performance growth. There is no difference between both firms in the business growth in the future. The result of this research complementarily upgrades the inference of prior studies (Adnyana & Firdaus, 2020; Rahim, 2013; Setiadie, 2019). Adnyana & Firdaus (2020) noted that some insurance firms are detected to have financial distress potential, meanwhile Rahim (2013) concluded that insurance firms look healthy and strong as well as can contribute to the economic growth and Setiadie (2019) disclosed that the insurance industry has big potential to grow due to the market share. To sum up briefly, no difference is found in this research because both tend to have the same market share required for society and some insurance companies tend to manage distorted earnings to make their growth stable.

5. CONCLUSION

We predict future trends experienced by the insurance industry under the use of the ARIMA model. The result forecasts that the insurance business over the period of 2021 to 2027 grows with positive and negative values. They will experience the ups and downs of business. The peak of the negative growth will go down in 2024 and further climb gradually in the year 2025 with positive values up to the year 2027. This research also notes that firms with distorted earnings under the proxy M-Score are found. We obtain 26 percent of financial statements with distorted earnings. Both distorted and non-distorted earnings in fact lead to an increase in the

level of future insurance growth but is there a difference in the magnitude of the level of future growth? the answer is no different. In other words, distorted earnings have a growth similar to actual earnings in the future. However, as they progress through the same business characteristics, the growth will be downs and ups in the future. The finding of our research aims to give policy, social and practical implications. In the context of policy implication, our finding is addressed to OJK. It provides a response that the growth prospects of the insurance business in the future experiencing the ups and downs is a warning for insurance companies to improve the quality of their performance well. On the other hand, this study is not a means of encouraging people to avoid investing more in insurance businesses whose prospects are considered to be ups and downs in the future, but it is vigilance and caution in choosing insurance issuers. Insurance companies having large size and high revenues are not a signal for society in determining prospect of business because they are not always to provide an attractive option for investing. Meanwhile, they with a fairly good business prospect can be reflected in the number of sales, total assets, and investments that are stable and appear to offer affordable premium prices. Related to the practical implication, our finding impacts public insurance firms. Present performance condition determines the business growth in the future, so they should maximize their performance from now. We are aware that the use of modified Beneish M-Score is infrequently utilized to detect fraud in the insurance industry, however, we have verified that five ratios are significant in formulating the equation model of M-Score. We also realize that the sample used is based on public insurance, so it is not too great. In this case study, the nature of predictions using forecast strategies is not discussed such as cross-validation which evaluates the performance of models in a robust manner. This limitation needs to be conducted for future studies. The relationship between growth levels and literacy regarding the understanding of insurance is also a challenge for future studies.

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Appendix 1. **The Effect of M-Score on the Level of Insurance Growth**

Variable	Pooled Least Squares		Fixed Effect Model		Random Effect Model	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Panel A. Effect Model Selection						
Constant	-2.757	-20.373***	-2.575	-21.462***	-2.575	-15.388 ***
M-Score	0.585	3.836***	0.517	3.915 ***	0.556	3.648 ***
R-Squared	0.179		0.357		0.164	
Adjusted-R-squared	0.165		0.248		0.154	
F-statistic	14.721***		3.279***		13.408***	
Chow Test	1.827	0.082				
Hausman Test					0.505	0.477
Lagrange Multiplier (LM)	2.151	0.142				
Observation	70		70		70	
Panel B. Pooled Least Squares and Robustness Test						
	Pooled Least Squares		Generalized Least Squares		Robust Least Squares	
Variable	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Constant	-2.757	-20.373***	-2.536	-37.571***	-2.591	-40.103 ***
M-Score	0.585	3.836***	0.636	6.524 ***	0.527	6.760***
R-Squared	0.179		0.385		0.117	
Adjusted-R-squared	0.165		0.375		0.104	
Rw-squared					0.437	
Adjust Rw-squared					0.437	
F-statistic	14.721***		42.574***			
Rn-squared statistic					45.710 ***	

Variable	Pooled Least Squares		Fixed Effect Model		Random Effect Model	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Jarque-Bera	3.893					
Prob. Value	0.142					
Breusch Pagan LM	58.425					
Prob. Value	0.0864					
Observation	70		70		70	

***Significant at 1%, **Significant at 5%, *Significant at 10%
The dependent variable is Insurance Growth (GROWTH) and the independent variables is M-Score
Source: Processed Data, 2022

Appendix 2. **The Result of M-Score**

Logit	M-Score	2014	2015	2016	2017	2018	2019	2020	Amount	Percentage
Distortion (0)	More than -2.22	5	3	3	1	2	3	1	18	26%
Non-Distortion (1)	Less than -2.22	5	7	7	9	8	7	9	52	74%
Total		10	10	10	10	10	10	10	70	

Source: Processed Data, 2022

Appendix 3. **Logistic Effect**

Variable	Pooled Least Squares		Fixed Effect Model		Random Effect Model	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Panel A. Effect Model Selection						
GROWTH	-2.848	-1.33	-3.329	-1.28	-3.469	-1.32
Log likelihood	-37.207		-17.198		-34.243	
LR/Wald chi2	5.39		4.35		1.75	
Probability > Chi2	0.020		0.037		0.185	
Pseudo R2	0.067					
Chow Test				3.22***		
Hausman Test	0.14					0.712
Lagrange Multiplier (LM)						5.93***
Observation	70		70		70	
Panel B. Random Effect Model and Robustness Test						
	Random Effect Model				Robust Least Squares	
Variable	Coefficient	t-statistic			Coefficient	t-statistic
GROWTH	-3.469	-1.32			-3.469	-1.30
Log likelihood	-34.243				-34.243	
LR/Wald chi2	1.75				1.69	
Probability > Chi2	0.185				0.193	
Observation	70				70	

***Significant at 1%, **Significant at 5%, *Significant at 10%

The dependent variable is Logit_EARNINGS where non-distorted earnings= 1 and distorted earnings = 0 and independent variable is Insurance Growth (GROWTH)

Source: Processed Data, 2022