General Insurance Supply in The Presence of Economy Regulation: A Case Study in Indonesia

Yohanes R. Agandhi[1], Darwati Susilastuti[2], Meirinaldi[3]
{combest75@gmail.com[1], darwatisusi@borobudur.ac.id[2], meirinaldi@borobudur.ac.id[3]}

Universitas Borobudur, Indonesia

Abstract. The purpose of the research is to present a review of a case study in Indonesia regarding general insurance supply in the presence of economy regulation. The supply of general insurance is affected by gross domestic product, asset, liabilities and equties of general insurance industry, inflation, exchange rate US$1/Rupiah and the presence of economy regulation released by the authority institution. The study shows that asset, exchange rate US$1/Rupiah and inflation have positive correlations to general insurance supply whilt gross domestic product, liability, eqauty and economy regulation presence had negative correlations to general insurance supply.

Keywords: authority institution; economy regulation; general insurance

1   Introduction

Insurance practices rooted from ancient history and found in King Hammurabi of Babylon (1810 – 1750 BCE) written in Hammurabi's Code. The conception of insurance practices stated that a debitor must not repay his debt whenever a debitor had suffered some personal accidents or disaster (such as disability, death, flood, earthquake and others) ruined debitor's ability to repay the debt (Beattie, 2021, p.1). Insurance business in Indonesia started around 1840 CE in colonized era at Batavia (now Jakarta) and Semarang accompanied increasing trade volume of plantation products generated underwriter demand to cover plantation products of risks for fire, rotten and robbery.

Basic assumption for market treated that market of goods/services is assumed as a perfect market. Jehle and Reny (2011, p.379) stated that insurance market is asymmetric information market. Another characteristic of insurance market in almost all countries is that the existency of government and/or an authority's intervention in insurance market based underliying law and regulation. Another words could be said that the value of premium is not only represented the pure of willingness to buy and the willingness to sell but also the value of the authority intervention such premium rate. One of reasons for the authority (in Indonesia done by Otoritas Jasa Keuangan (OJK) or Indonesia Financial Service Authority) to intervene and regulate insurance market and industry since that public fund is pooled by insurance industry. According to Posner (1974, p.1) stated that authorized institution's intervention in term of regulations whereas regulation representing supply for public demand as corrections of ineffiency and inequality market practices.

Currently insurance is part of financial industry in Indonesia and insurance industry consists of general (property and casualty) insurance, life insurance, reinsurance, general insurance shariah, life insurance shariah and shariah reinsurance. According to the Law of the

Republic of Indonesia No. 40 The Year 2014 regarding Insurance verse 1 number 1, insurance is an agreement of two parties, an insurance company and policy holder, that based such agreement premium received by an insurance company to give reward: a. to provide compensation for underwritee or policy holder caused of loss, damage, cost incurred, profit loss, or third party liability that might be suffered by underwrutee or policy holder affected an uncertainty event where such event might be happened; b. to provide payment relied on the death of underwrite or policy holder or payment based on the life of underwrite whereas the amount value of payment based on predetermined value stipulated in such agreement and/or based the return of managed fund. From the above mention, terminology in point a is referring general (property and casualty) insurance and terminology in point b is referring life insurance. According to the Law No. 40 The Year 2014 regarding Insurance verse 1 number 5 stated that general insurance business is business service for risk underwriting to provide compensation to underwrite or policy holder caused of loss, damage, cost incurred, profit loss, or third party liability that might be suffered by underwrutee or policy holder affected an uncertainty event where such event might be happened;

The research is focused in general insurance industry which comprises 71 general insurance companies: 3 state owned companies, 19 joint ventures, and 49 private companies. Basic principle of insurance business practices is to spread risks. Insurance mechanism could be mentioned as follows. Insurance company underwrite insured object and when value of such insured risk is in the range company capacity to aborb that risk, with underwriting governance consideration, the insured object could be self insurance by the company with regard its own retention of risk. Whenever insured risk value exceeds its own retention capacity and risk and loss mitigation consideration, the company should take a reinsurance action for some or major value of such risk to spread risk. The insurance company must comply with the regulation of risk own retention issued by OJK eventhough premium of insured risk is lucrative and profitable and claim probability is relatively small.

Assumptions used in this study are that general insurance supply affected by product domestic bruto, the general insurance industry of assets, liabilities, and equities, exchange rate US$1/Rupiah (Rp), inflation rate and the presence of any economic regulation released by OJK within quarterly period. Data used in the study covered quarterly data since 2015 to the second quarter of 2022 (see Attachment 1). From such data, development of general insurance in term of assets could be said that assets' value tended to increase steadily (see Table1).
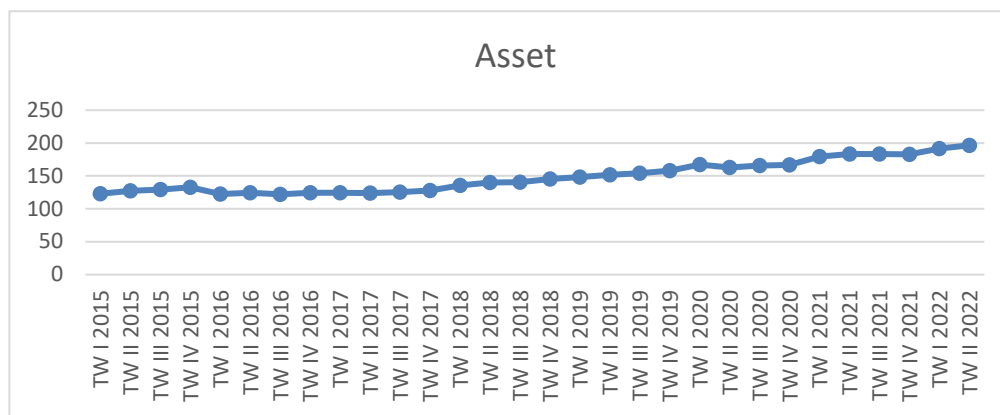

Fig 1. General Insurance Assets (in triliun Rp)

As mentioned earlier, basicly insurance market is an exception for perfect market mechanism and be a regulation target. There are four underlying reasons that economic regulation to regulate and supervise (1) Financial solvability is a main fundamental for public trust in insurance business mechanism. The ability of financial solvability should eliminate marginal companies dan inferior in the competitive condition, therefore such companies are not accord or suitable with insurance business characteristic mainly to assure financial liability whenever contigency liabilities occurred. (2) Policy holders have limited ability to measure and evaluate insurance companies' promise regarding future financial performance as consumers evaluate tangible goods. (3) Free business entry in insurance industry is undesirable due to fiduciary relationship between underwriter and undewritee or policy holder, fraud probability and financial speculative by unregulated companies propornent. (4) Intensive market competition and unregulated business would resulted unfair loss adjustment practices, misleading term and condition in policy, monopoly and all of these are against public interest (William, Smith and Young, 1995, p.358). Another reason to regulate insurance business is to minimize negative externalities.

Driven Factors

Insurance business is dealing with risks. In general, risk is any difference between results and expectation where unexpected result produced negative financial value or loss. The business is also related to moral hazard as negative behavior resulted negative financial value. Arnoot and Stilglitz (1988, p.2) stated that the occurance of moral hazard happened if individual behaviors and actions could not be observed by the insurance company.

Insurance market is information market. If insurance market provides perfect information so potentioal buyers will enter perfect information. Hendren (2012, p.2) stated that if potential insurance buyers have private information, with assumption that potential risks had already clustered, such buyers will reject and reluctant to buy insurance protection. Besides moral hazard, adversed selection is faced by insurance business where the company could not indentify the probability of accident of consumers so that the company has only probability distribution of consumers' accidents. In fact insurance market is asymmetry information market. According to Jehle and Reny (2011, p. 385) stated that in asymmetry information condition if the price of insurance premium increase, the utility of consumer received will decrease.

General insurance industry is aggregation of individual general insurance company. The industry's performance is measured through premium revenue that treated as supply of the general insurance industry. The study will review factors affected supply of the general insurance industry: gross domestic product, asset, liability, equity, exchange rate US$1/Rupiah, inflation, and economic regulations issued by OJK. Below explanation would elaborate each factor.

a. **Gross Domestic Product**

Economy, politic, social and security are parts of macro environment affected industries' performance. One of macro economic factors usually used to determine economic performance is gross domestic product. Business cycle basicly is captured by the movement of gross domestic product where either up and down movement in term of macro level. In general the industries of business cycle follow the movement of gross domestic product. Gross domestic product is the flow of new product at certain period, one year or a quarter of a year (Hall and Taylor, 1988,

p.238). According to Garin, Lester and Simms (2021, p.23) stated that gross domestic product is a reflection of current monetary value of all final products and or services produced by a country at certai period of time. Such terminology could be implied that good in process is not included to calculate into gross domestic product.

b. Asset, Liabiliy and Equity

Asset and liability are the main measurement of income. In term of financial performance, income measurement should comply with matching cost against revenue principle that periodic revenues must be matched to expenses. In other words it could be imply that relationship between assets, liabilities and revenues is intercomplementary (Matshuhita, 2014, p.1).

Equity is closely related to assets at start-up business as reflected in paid-in capital where such capital should be managed to generate revenue. For the time being and the running of business operational and management, assets and liabilities are growth and equities are measured as the final claim of assets calculated total assets deducted by total liabilities at the end of period of year. In this study, asset, liability and equity are treated as independent variables, along with other variables that are gross domestic product, exchange rate US1/Rupiah, inflation rate and economic regulation, to determine premium revenue.

c. Exchange Rate

Indonesia currency is Rupiah as a legal tender. Basicly Indonesia adopts open economy policy and implements trades among countries which in turn will exchange its currency among others. Foreign exchange rate represents money value of foreign country where citizens of a country acquire through exchange one unit of its currency (Gordon, 1990, p.421). An exchange rate is basicly refered to the value of one unit currency of a country for other currencies (Madura, 200, p.97). In other words the price of one unit currency of a country in term of other countries currencies and the value of such currency tende to change accompanied with economy fluctuation of such country.

The exchange rate used in the study is the exchange rate of US$1 to Rupiah. One of underlying reasons is many of underiting objects are covered and valued in term of US $ value and reinsurance practices to abroad used US$.

d. Inflation Rate

Fluctuation economy activities are happened in almost everey country and prices of good and/or services tend to increase in associated with inflation. Gordon (1990, p.244) stated that inflation refers ton steadily increase of aggregate price level bwhich burdern good/service. Inflation could be interpreted as percentage change of average price level of all goods/service at am economy (Hall and Taylor, 1988, p.8). From such terminologies, inflation is closed related to economy and business cycles in a country. Economy growth of a country is usually followed by inflation rate increase or prices of goods/service tend to increase. In contrary condition, if economy of a country is contraction, or prices of goods/service tend to go down.

To measure general insurance performance should be associated with inflation rate and gross domestic product to review whether the industry is growth or contraction (negative growth) so that it could be predicted sources of the industy's growth came from external or internal factors. External factors causes such as an economy expansion would be a trigger to increase society's income and enlarge opportunity of the industry's contribution to the economy.

Internal factors causes such as product innovations, information tech implementation, and the increase competitiveness among companies within the industru should also be reviewed further.

e. Regulation

Posner (1974, p. 2) argued that economy regulation theory consisted two types of theory: public interest theory and capture theory. Public interest theory explained that the regulation refered to supply provided to respon public demand to correct market ineffiency, whereas capture theory stated that the regulation provided for interest pressured groups and among each member of such group and by intention to maximize its revenue. According to Viscusi, Vernon and Harrington (1992, p. 295) stated that in general economy regulations is associated with limitation imposed by the government to companies' decision or business doers for price, quantity, entry and exit of doing business.

Business doers in general insurance practices must be comply with establishment regulation. According to OJK Regulation Number 67 the Year 2016 verse 6 (1) stated that paid-in capital requirement amounted Rp 150 billions in cash/bank must be fulfilled by a company that established a insurance company. Such regulation affected insurance business practices and in turn insurance performance is determined not only by market power but also by the government or an institution authorized by the law regarding resources allocation and productivity and effectiveness done by insurance companies.

According to Stigler quoted by Carrigan and Cogliance (2016, p.1) argued that regulations produced are purposed to all public interests through market failure corrections. Piore (1984, p.4) purposed regulation theory that regulation, in the normal condition, is to assure through internal equilibrium mechanism that coordinated economy system and maintain equilibrium treatment amongs and within business doers or economy constituents. An example of such regulation is refered to monetary system and automatic stabilizer in New Keynessan approach that represented internal equilibrium mechanism to coordinate economy system whereas price system is the equilibrium form amongs economy constituents.

2 Review and Analysis

The study would elaborate further to review and analysis that general insurance supply in the presence of economy regulation in Indonesia is affected by factors consist of gross domestic product, asset, liability and equity of the general insurance industry, exchange rate US$1/Rupiah, inflation rate and regulation released by OJK on quarterly basis. Multiple ordinary least square regression method is applied to test hyphotheses. According to Gujarati (1991) multiple ordinary least square regression is referred to a technique that some independent variables are tested to a dependent variable. Dummy variable is used for regulation variable where any regulation released by the regulator within quarterly period is valued by 1 and 0 (zero) if no regulation issued by the regulator within three months. From the above statement, it could be assumed that dependent variable is premium that treated as supply of general insurance industry and independent varibles are asset, liability and equity of the general insurance industry, exchange rate US$1/Rupiah, inflation rate and regulation.

Based on above assumptions, it can be expressed that premium is a function of gross domestic product, asset, liability, equity, exchange rate, inflation rate and regulation. Such function could be expressed in equation [1].

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + X_6 + X_7 + \varepsilon \qquad [1]$$

Explanation of variables in in equation [1] are mentioned as follows. Y is premium and treated as supply of Indonesia's general insurance and α is a constant. $X_1, X_2, X_3, X_4, X_5, X_6$ and X_7 are gross domestic product, asset, liability, equity, exchange rate, inflation rate and regulation respectively. $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$ and β_7 are coefficients of $X_1, X_2, X_3, X_4, X_5, X_6$ and X_7 respectively and ε is error term. Hypotheses assumptions are mentioned below.
$H_0 : \beta_1 = 0$; $H_0 : \beta_2 = 0$; $H_0 : \beta_3 = 0$; $H_0 : \beta_4 = 0$; $H_0 : \beta_5 = 0$; $H_0 : \beta_6 = 0$; and $H_0 : \beta_7 = 0$
where $H_a : \beta_1 \neq 0$, $H_a : \beta_2 \neq 0$ $H_a : \beta_3 \neq 0$, $H_a : \beta_4 \neq 0$, $H_a : \beta_5 \neq 0$, $H_a : \beta_6 \neq 0$, and $H_a : \beta_7 \neq 0$.

Applying equation [1] with log normal, with exception of numeric values of X_6 and X_7 are ≥ 0 and ≤ 1, we get
$$Ln\ Y = \alpha + \beta_1 \ln X_1 + \beta_2 \ln X_2 + \beta_3 \ln X_3 + \beta_4 \ln X_4 + \beta_5 \ln X_5 + X_6 + X_7 + \varepsilon \quad [2].$$

Based on data in Attachment 1 and OLS multiple regression technique are applied to equation [2], we get $R^2 = 0.718$ and adjusted $R^2 = 0.628$. The value of adjusted R^2 means that all indenpendents have relatively influence relationship to a dependent variable. In other words, gross domestic product, asset, liability, equity, exchange rate, inflation rate and regulation have influence contribution equal to 62.8% toward premium or supply of general insurance. Regreesion result of equation [2] is mentioned below.
$$Ln\ Y = -19.68 - 0.41 \ln X_1 + 24.87 \ln X_2 - 15.65 \ln X_3 - 8.01 \ln X_4 + 0.74 \ln X_5 + 0.2 X_6 - 0.04 X_7 + \varepsilon$$

(20.48)   (0.43)   (27.02)   (16.95)   (10.34)   (1.13)   (0.08)   (0.05)

Above results are also proved that test hyphotheses are true where $H_0 : \beta_1 = 0$, $H_a : \beta_2 \neq 0$, $H_a : \beta_3 \neq 0$, $H_a : \beta_4 \neq 0$, $H_a : \beta_5 \neq 0$, $H_a : \beta_6 \neq 0$, and $H_a : \beta_7 \neq 0$ and $\beta_1 = -0.41$; $\beta_2 = 24.87$; $\beta_3 = -15.65$; $\beta_4 = -8.01$; $\beta_5 = 0.74$; $\beta_6 = 0.2$ and $H_a : \beta_7 = -0.04$

Variables Description

Value of $\alpha = -19.68$ could be explained that supply or premium of general insurance industry variabel value before or without influence of of gross domestic product, asset, liability, equity, exchange rate, inflation rate and regulation variables where if there is no supply or supply variable value = 0 , supply value = - 19,68 trillion Rp. From data of Attachment1 shows that premium or supply trends to increase.
GDP coefficient = -0.41 means that if GDP increases Rp 1 trillions will deduct premium by Rp 0.41 trillion. Asset of the general insurance aindustri coefficient is + 24.87 meaning that additional asset by 1 trillion Rp will increase premium by Rp 24.87 trillion. Liability and equity coefficients are – 15,65 and – 8,01 respectively meaning that addititonal each trillion Rp of liability and equity will affect reducing premium by Rp 15,65 trillions and Rp 8,01 trillions. Coefficients of exchange rate US\$1/Rp and inflation rate are 0.74 and 0.2 respectively. In turn that if any increase exchange rate US\$1/Rp would push up premium by Rp 0.74 trillion and any increase 1% of inflation rate would impact by ascending premium by Rp 0.02 trillion. Regulation coefficient is – 0.04 meaning that any regulation released by a regulation authority will reduce premium by Rp 0.04 trillion.

Asset, Liability and Equity

Asset, liability and equity are internal factors within general insurance industry and such factors are closed relationship each other. From attachment 1, average values of asset and equity of general insurance industry are Rp 148,666,391.00 trillions and Rp 56,334,094.86 trillions respectively whilt average value of liability of such industry is Rp 92,259,335.24 trillions. In term of equity multiplier calculated through asset divided by equity is 2,64 times. Based on premium general insurance contribution to GDP, on average premium of such industry to GDP is relatively small that is just 0.44%. As mentioned earlier, equity is the source of fund that would convert to asset and in turn to generate premium revenue. From the above results, the study predicts that equity multiplier has a sufficient opportunity or room to enlarge at least to be 3 times. Equity value is direct related to paid-in capital requirement when the general insurance business is established. In general insurance size matters meaning that the bigger the paid-in capital, the bigger the asset as a trigger a bigger opportunity to generate premium revenue whereas premium revenue is treated as general insurance supply. Since regulation of paid-in capital is Rp 150 millions, the study draw that paid-in capital requirement should be amended with amounted at least Rp 500 million. The reason to amend such requirement is the bigger the value of paid-in capital, the bigger the ability the general insurance business to convert into asset and in turn the bigger capability and opportunity to generate premium revenue treated as general insurance supply.

Exchange Rate and Inflation

Exchange rate and inflation variables have positive correlation with premium meaning that the up and down movement of premium is the same direction with the movements of exchange rate and inflation. From the attachment 1, the value of US$1 in term of Rupiah tends to increase referring that the bigger the value of US$1, the bigger the premium value since so from me portion of premium revenue are resulted from insurance objects valued in US$.
Inflate rate indicates the growth of economy if inflation growth is in normal or moderate rate usually less than 1 digit or lesst than 10 % as a rule of thumb. Inflation rate affects the price of goods included insurance objects to push-up.. The higher the value of insurance objects, the bigger the value of premium revenue in turn the bigger the supply of general insurance.

Gross Domestic Product

GDP represented a macro indicator where the general insurance business operates. GDP movement either up or down is in general assumed that the movements of all industries are the same direction with GDP movement with exception for certain industries move opposite direction of GDP.

The result of multiple ordinary least square regression of GDP variable coefficient is – 0.41 referring that the movement of premium is opposite direction of the movement of GDP. We study further using single regression assumed that premium is a function of GDP. Implementing such function resulted that adjusted $R^2 = 0.829$ and coefficient of GDP = + 0.039. The number of R^2 indicates that GDP has influence to premium account for 82,9% and the change of GDP impacts to the change of premium by Rp 0.039 trillion.

Regulation

Regulation coefficient resulted from the above regression is – 0.04 meaning that any regulation issued by the regulator would impact premium revenue by deduction Rp 0,04 trillions. That result could be implied that regulation tended be supply provided to respon public demand to correct market ineffiency and inequality (Posner, 1974, p.1). The impact of general insurance regulations imposed by the regulator should be analyzed further for the next study.

3   Conclusion

Based on the above explanation and study results, it could be summarized as follows.

a. The result of adjusted $R^2 = 0.628$ is referred to all indenpendents have relatively influence relationship to a dependent variable where gross domestic product, asset, liability, equity, exchange rate, inflation rate and regulation have influence contribution equal to 62.8% toward premium or supply of general insurance.
b. The study shows that asset, exchange rate US$1/Rupiah and inflation have positive correlations to general insurance supply whilt gross domestic product, liability, equity and economy regulation presence had negative correlations to general insurance supply.
c. General insurance market is imperfect information market due to that premium value is determined not only by market power (supply and demand) but also influenced by OJK's regulations.

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Attachment 1 : Premium, Gross Domestic Product, Asset, Liability, Equity, Exchange Rate US41/Rp,, Inflation, and Regulation in Quarterly Basis (2015 to Q2 of 2022) in Indonesia

Quart	Premium	GDP	Asset	Liability	Equity	USD1/RP	Inflation	Regu-lation
2015 / 1	11.466.000,00	2.728.180.700,00	122.757.000,00	78.758.000,00	43.999.000,00	12.762,00	0,77	1
2	14.302.000,00	2.867.948.900,00	127.259.000,00	82.799.000,00	44.460.000,00	13.208,00	1,4	1
3	12.713.000,00	2.990.645.000,00	129.490.000,00	84.163.000,00	45.327.000,00	13.994,50	1,37	0
4	19.031.000,00	2.939.558.700,00	132.561.000,00	82.954.000,00	49.607.000,00	14.226,00	1,25	1
5	13.033.967,69	2.929.269.000,00	122.612.180,82	77.155.055,84	45.457.124,98	13.535,50	0,79	0
6	14.591.273,61	3.073.536.700,00	124.349.633,24	78.599.201,09	45.750.432,14	13.357,75	1,35	1
7	10.977.788,38	3.205.019.000,00	122.082.432,97	75.680.836,64	46.401.596,33	13.177,88	0,93	1
8	14.656.047,22	3.193.903.800,00	124.437.393,65	76.879.463,94	47.557.929,70	13.306,94	1,03	1
9	12.945.057,79	3.228.172.200,00	124.354.753,05	75.149.021,21	49.205.731,84	13.313,97	1,22	0
10	12.955.015,99	3.366.787.300,00	123.813.320,28	74.024.288,16	49.789.032,12	13.316,48	1,17	1
11	13.144.714,05	2.929.269.000,00	125.224.315,11	74.597.251,19	50.627.063,92	13.404,24	0,42	1
12	15.611.306,08	3.490.727.700,00	127.944.884,82	75.671.827,31	52.273.057,51	13.476,12	0,92	0
13	14.395.185,93	3.510.363.100,00	135.552.746,72	82.219.168,84	53.333.577,88	13.616,06	0,99	0
14	14.930.872,89	3.686.836.400,00	139.934.269,89	87.083.289,94	52.850.979,95	14.010,03	0,9	1
15	12.961.513,23	3.842.343.000,00	140.654.384,76	87.077.867,76	53.576.517,00	14.469,52	0,51	0
16	17.723.422,56	3.799.213.500,00	145.351.762,18	90.076.706,23	55.275.055,95	14.475,26	1,23	1
17	17.099.298,80	3.782.626.800,00	148.191.601,93	91.528.845,40	56.662.756,53	14.359,63	0,51	0
18	17.973.311,89	3.964.191.200,00	151.463.163,42	93.964.992,29	57.498.171,13	14.250,31	1,67	0
19	15.708.417,16	4.067.226.600,00	153.950.428,98	94.684.582,37	59.265.846,61	14.212,16	0,7	1
20	19.006.532,29	4.018.490.800,00	157.933.320,78	95.454.821,02	62.478.499,75	14.056,58	0,51	0
21	17.607.062,69	3.922.556.800,00	167.442.949,44	104.776.827,88	62.666.121,56	15.211,79	0,77	0
22	15.488.062,76	3.687.806.700,00	163.051.881,58	100.123.466,21	62.928.415,37	14.756,90	0,33	0
23	14.240.735,56	3.894.617.100,00	165.572.244,80	101.153.814,62	64.418.430,18	14.837,45	0,2	1
24	19.955.304,70	3.929.171.200,00	166.775.674,77	100.946.193,56	65.829.481,21	14.471,23	0,72	0
25	18.351.517,19	3.970.484.000,00	179.585.442,89	109.141.432,44	70.444.010,45	14.521,61	0,44	0
26	15.597.332,23	4.175.844.000,00	183.448.667,31	116.036.924,01	67.411.743,30	14.508,81	0,61	1
27	14.965.284,12	4.325.437.000,00	183.232.530,60	115.216.089,20	68.016.441,40	14.407,91	0,15	1

28	27.958.358,46	4.499.035.000,00	182.695.557	114.230.636	67.740.221	14.288,00	1,06	0
29	21.669.432,66	4.513.300.000,00	191.649.935	121.153.274	69.764.631	14.309,00	1,24	1
30	21.276.833,09	4.919.900.000,00	196.619.243	126.480.180	69.406.977	14.598,50	1,96	1

Source: Otoritas Jasa Keuangan, Badan Pusat Statistik and Bank Indonesia

1) In million Rupiah: Premium, GDP, Asset, Liability, Ekuity
2) Inflation dan Exchnage Rate USD1/Rp based on average mid rate quarterly:
   {(beginning rate + ending rate)/2}
3) Regulation issued by OJK within quarterly basis.