Profitability Determinants of Pension Fund Companies in an Emerging Market Economy: Empirical Evidence from Indonesia during Covid-19 Outbreak

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Abstract

Purpose – The purpose of this paper is to investigate the factors affect the profitability of pension fund companies in Indonesia before and after Covid-19. This paper analyzes the relationship between portfolio investment, specific company characteristics, macroeconomics indicators, and pension fund profitability in the period 2013 - 2021.

Design/methodology/approach – The study used 151 individual data of pension fund companies in Indonesia from 2013 to 2021. Panel data analysis used to analyze the impact of portfolio investment, specific company characteristics, macroeconomics indicators, and Covid-19 Outbreak on the profitability of financial institutions.

Findings – The robust results reveal that the pension fund profitability in Indonesia is explained by the propotion of stock owned by the company, the operating cost ratio, and the ratio of accounts receivable to net assets. The higher the propotion of stock owned by company, the higher the company's profitability. On the other hand, the operating cost ratio and the ratio of accounts receivable to net assets are found to be negatively and significantly related to the company's profitability. Furthermore, this study found that the Covid-19 Outbbreak did not have a significant impact on the profitability of pension fund companies.

Originality/value – This study is the first to compare the determinants of pension fund profitability during the Covid-19 Outbreak. This study used population data of individual pension fund institution in the period 2013 - 2021.

Keywords Profitability, Portfolio investment, Pension Fund, Data Panel

Paper type Research paper

1. Introduction

The unpredictable impact of the Covid-19 has affected all aspects of people's lives, including the financial services sector. In the financial market, Covid-19 has increased volatility, uncertainty, complexity and ambiguity (VUCA). It has an impact on increasing investment risk, both for retail investors and institutional investors, including Bank, Insurance, and Pension Fund. This condition is increasingly becoming a public concern, including the Financial Services Authority (OJK), especially due to the emergence of investment cases in low-quality assets that were previously carried out by financial service institutions that collected funds from the public.

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As a financial service institution that collects funds from the public, the growth in total assets of Pension Funds tends to be stable during the Covid-19. In the last two years, the total assets of the national Pension Fund industry grew 10.84 percent to IDR 323 trillion. In line with these conditions, total Pension Fund investment grew by 10.80 percent in the same period. This shows that in accordance with its business model, the intermediation performance of Pension Funds tends to be more resilient compared to other financial service institutions during the Covid-19 Outbreak.

As the financial market in Indonesia develops, pension fund companies have many alternative options for placing their assets. Choosing the right investment alternative can increase the company's profits in the future. With its resources, the pension fund company is expected to be able to invest in various alternative portfolio investments so as to improve the company's financial performance and also be able to provide liquidity for the domestic financial market. However, Raddatz, C., and Schmukler, S. L. (2013) found a tendency for pension fund companies to invest in herding patterns. While some large pension fund companies invest in portfolios that have relatively higher returns and risks, this condition will be followed by other industries. Conversely, this pattern is relatively less visible for investments that tend to be unattractive. Meanwhile, Blake *et.al.* (2013) implicitly show empirical results that investment diversification affects investment performance. This is influenced by the tendency of investment managers to invest in different assets or in one type of investment.

The OJK regulation that specifically regulates Pension Fund investments is POJK Number 3/POJK.05/2015 concerning Pension Fund Investment which has been amended by POJK Number 29/POJK.05/2018 concerning Amendments to POJK Number 3/POJK.05/2015 concerning Pension Fund Investment. The regulation regulates the types of investments that can be used by Pension Funds, as well as the maximum portion and investment quality of Pension Funds in certain types of investments. As of November 2021, the top five investment portions for Pension Funds are SBN (29.18 percent), Time Deposits (25.69 percent), Corporate Bonds (19.37 percent), Stocks (9.97 percent), and Mutual Funds (5.21 percent).

There are many alternative portfolio investments that can be chosen by pension fund companies, so this will affect the company's financial performance, including profitability. Many studies in the world have shown a relationship between the portfolio investment and company profitability (Adams, 1978; Anbar *et.al.*, 2011; Blake *et.al.*, 1999; Petajisto, 2013; Agblobi *et.al.*, 2011).

Meanwhile, Covid-19 Outbreak had a significant impact on global economic conditions which triggered a global crisis and hit global financial markets, especially the stock market. Allmen *et.al.* (2020) explained that Covid-19 affected financial market conditions from various aspects, especially shocks on the stock market, government financial disruptions, commodity markets, and property prices. Shocks in various financial markets are expected to disrupt the level of profit earned by companies that invest heavily in financial markets, including pension fund company.

Based on the background and problems that have been presented, this study aims to: a). Identify the development of the portfolio investment of pension funds in Indonesia;

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b). Analyze the portfolio investment that can affect the company's profitability, and c). Analyze the impact of Covid-19 on portfolio investment patterns and the profitability of pension fund companies.

This study is expected to provide contributions and benefits to many parties. First, for regulators, this research can be a reference in formulating policies to encourage the performance of pension fund companies in the future. Second, for business actors, especially pension fund companies, this study can provide appropriate information in choosing alternative portfolio investments that can increase company profitability and identify factors that need to be considered in increasing company profitability. Finally, for academics, this research can fill the gap in the research related to pension funds in emerging market economy due to limited data.

This study is arranged into five parts. The next section presents a literature review related to relevant theories and previous research. Section 3 describes the methodology used in the study. Section 4 presents the results of the research and discusses the appropriate arguments. Finally, section 5 summarizes the key elements, provides conclusions and policy implications.

2. Literature review

2.1 Portfolio investement and profitability

Many studies have shown that the level of profit of a financial institution is closely related to the selection of portfolio investment. Adam (1978) stated that changes in the pattern of investment banking in the United States in the 1980s, which initially invested heavily in government debt, then switched to private debt, resulted in the profits earned by banks continuing to decline. In line with the results of this study, Agblobi *et.al.* (2020) also stated that banks in Ghana that invest a lot in government bonds have a significantly higher average profit compared to banks that invest a lot in other investment instruments.

Meanwhile, research explaining the relationship between portfolio investment of pension funds and their level of profitability is still very limited. Anghelache and Armeanu (2008) theoretically explain that in order to optimize the profitability of pension fund companies, a comprehensive technique is needed in selecting the company's portfolios. As for studies that specifically conduct empirical studies of the relationship between portfolios and profit levels, they are still very rare, so this research is expected to fill the gaps in existing research so far.

2.2 Determinant of Financial institution profitability

The profitability of a financial institution is not only influenced by the type of portfolio investment the company chooses, but it is also determined by many other factors.There are many studies related to the factors that affect the profitability of a financial institution, particularly related to banking profitability. Several early studies discussing the factors that influence profitability are Short (1979), Bourke (1989), and Berger (1995). Based on the existing literature, the factors that are considered to affect the profitability of financial institutions can be divided into two groups, the first is company characteristics and macroeconomic variables (Ali *et.al.*, 2011)

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2.3 Impact of Covid-19 on Profitability

Along with the magnitude of the impact of Covid-19 on various aspects of the economy, there has been quite a lot of research related to the impact of Covid-19 on company's performance. One of them is Esomar (2021) who analyzes the impact of Covid-19 on the financial performance of finance companies in Indonesia. The results of this study indicate that there were differences in the financial performance of finance companies in Indonesia before and after Covid-19. The financial ratios measured in this study are FDR, NPF, ROA, and ROE.

3. Methodology

3.1 Data and methodology

This study used data from all Pension Fund companies which have complete annual report data for the period 2013 to 2021. The number of companies analyzed in this study were 151 companies consisting of 16 Financial Institution Pension Fund companies (DPLK), 22 Contribution Employer Pension Fund Companies (PPIP), and 113 Defined Benefit Employer Pension Fund Companies (PPMP). The selection of these 151 companies was related to the completeness of the data reported by the companies to the authorities according to the research period.

Table 1. *Number of sample*

Program Type	Number of Companies	Number of Complete Data Companies
DPLK	30	16
PPIP	59	22
PPMP	200	113
Total	289	151

The variables used in this study are return on assets (ROA) as the dependent variable and the four independent variable groups. The first independent variable group is the proportion of the portfolio investment (X) owned by the company which consists of the portion of stocks to total investment (Prop_Stock), the portion of mutual funds to total investment (Prop_Mutual), the portion of government bonds to total investment (Prop_Gov), the portion of corporate bonds to the total investment (Prop_Corporate), and the portion of property asset ownership (Prop_Property). The second group of independent variables is specific company characteristics (C) consisting of total assets (Ln_Asset), operating cost ratio (Cost_Ratio), funding ratio (Funding_Ratio), and the ratio of accounts receivable to net assets (Receivable_Ratio).

Meanwhile, the third and fourth groups of independent variables which are considered to affect the profitability of pension fund companies are variables outside the company. The third group of independent variable is macroeconomic variables (K) which

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are considered to affect the level of profitability, consisting of economic growth (Growth), Inflation (Inflation), volatility of the composite stock price index (Vol_JKSE), and exchange rate volatility (Vol_Xrate). The last independent variable in this study is Covid-19 which is expressed as a dummy variable (D) in the modeling.

In analyzing the effect of the types of investments and the impact of Covid-19 on the performance of Pension Funds in Indonesia, the panel data analysis method is used. Panel data is a combination of time-series and cross section data. Meanwhile, panel data regression is a regression technique that estimates a combination of cross-sectional data and time-series data, so that the number of observations in panel data is greater than cross-sectional data and time-series data (Gujarati, 2004). In its implementation, there are three estimation techniques for panel data analysis, they are pooled least squares, fixed effect models, and random effects models. Selection of the best model was carried out using the Chow and Hausman tests.

3.2 Empirical model

The empirical model used to measure the factors that affect the level of profitability is divided into two parts. In the first stage, a model was developed to measure the effect of the portfolio investment, the characteristics of pension fund companies, macroeconomic variables, and the Covid-19 outbreak period with the following equation:

$$Y_{it} = \alpha_i + \beta_{1j}X_{it} + \beta_{2j}C_{it} + \beta_{3j}K_{it} + \beta_{4.}D + u_{it} \qquad (1)$$

where:

Y_{it} = ROA of each company

X_{it} = vector of the portfolio investment proportion owned by the company

C_{it} = vector of specific company characteristics variables

K_{it} = vector of macroeconomic variables

D = dummy variable, 1 for the Covid-19 period

α_i = constant

β_{nj} = regression coefficient for each independent variable

i = pension fund company

t = time

u_{it} = error term

In order to obtain comprehensive information regarding the effect of Covid-19 and the portfolio investment on the level of company profitability, an additional analysis is carried out by adding the interaction variable between the dummy Covid-19 and the vector of portfolio investment variable, as expressed by the following equation:

$$Y_{it} = \alpha_i + \beta_{1j}X_{it} + \beta_{2j}X_{it} * D + \beta_{3j}C_{it} + \beta_{4j}K_{it} + \beta_5.D + u_{it} \qquad (2)$$

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$X_{it} * D$ is an interaction variable between the Covid-19 dummy and the vector of portfolio investment variable.

4. Results of study

4.1 Trend of Portfolio investment and Profitability

Pension Funds have 21 alternative investment instruments that are permitted by the Financial Services Authority (OJK) in their investment activities. This is stated in OJK regulation Number 29/POJK.05/2018 concerning Pension Fund Investments. Based on the 21 investment instruments, the largest portion is dominated by Government Securities, Deposits, Bonds, and Stocks.

Figure 1 shows the trends of portfolio investment made by pension fund companies during the 2013-2021 period. Before Covid-19, the largest portion of the pension fund's portfolio investment in 2019 was deposits, which was around 29 percent of total investment. The second investment instrument most chosen by pension fund companies is government bonds with a portion of around 24 percent, followed by private bonds, and stocks. In the early period of the pandemic, in 2020, pension fund companies still chose deposits as the main investment instrument with the same portion as the previous year, which was 29 percent. However, during the post-pandemic period, there has been a shift in the portfolio investment pattern of pension fund companies, where government bonds are the most preferred investment instrument. It is because during the postCovid-19 period, the government of the Republic of Indonesia experienced a large budget deficit, so that the government issued many government bonds with more promising returns. Therefore, this condition has encouraged many pension fund companies to switch their investment assets from deposits to government bonds. Meanwhile, the performance of other investment instruments tended to be the same both before and after Covid-19.
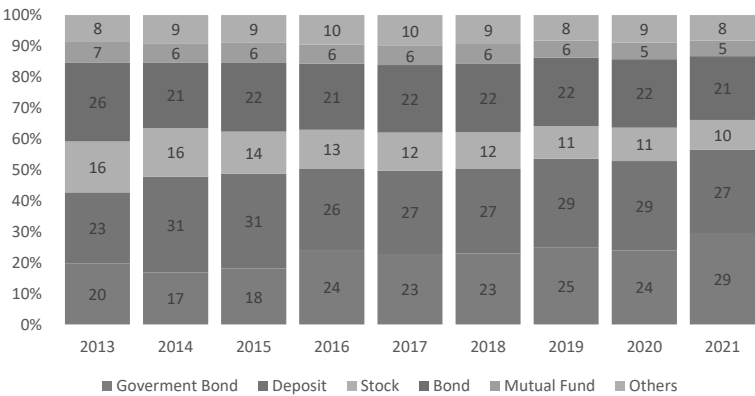

Figure 1. *Portion of pension fund investment portfolio during 2013-2021*

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Changes in the portfolio investment chosen by the pension fund company will have an impact on changing the level of company profitability. One indicator that shows the level of profitability is Return on Investment (ROI), wherw the greater the value of ROI, the better the investment performance of pension funds.

As discussed in the previous section, pension fund companies are divided into 3 types, they are PPMP, PPIP, and DPLK. Figure 2 shows that among the three types of pension fund companies, PPMP pension funds tend to have a higher ROI value. In accordance with their characteristics, thesetype of pension fund companies tend to be more active and invest more in instruments that provide higher returns, even though the risks they face are also high. Usually, these type of pension fund companies invest a lot in stocks and they are active in buying and selling shares. In 2019, the ROI for this type of investment was 9.03 percent, then during the pandemic it increased to 9.66 percent, and decreased in 2021 to 6.92 percent.

On the other hand, PPIP pension funds tend to be more conservative, so the returnstend to be lower than other types of pension funds. However, with the precautionary principle of this company, when there is a shock such as the Covid-19 outbreak, the return on investment from this type of company has not changed significantly, although it has experienced a relatively small decrease. Finally, DPLK pension funds develop a return on investment that tend to be moderate. In 2020 the ROI from DPLK has increased significantly, from 7.70 percent to 9.58 percent. Meanwhile, in 2021 the value has decreased drastically to 4.65 percent.
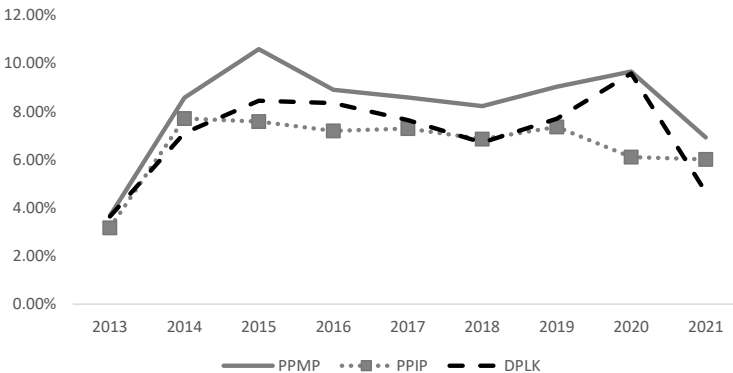

Figure 2. *Trend of pension fund profitability based on types of companies*

Based on the description of the development of portfolio investment data selected by pension fund companies, as well as the development of return on investment from various pension fund companies, it can be seen that there has been a change in the

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portfolio investment pattern and the level of profit obtained by the companies. However, this needs to be proven statistically, whether Covid-19 can have a significant effect on the level of profitability of pension fund companies.

4.2 Determinant of Profitability

In analyzing the factors affecting the profitability of pension funds during the period before and after the Covid-19, several tests were carried out in the early stages to be able to provide the best and most robust estimation results. Based on the results of the Chow Test and the Hasuman Test, the best model is the fixed effect model. The following below is the result of of profitability analysis, in general.

Table 2. Estimation Result the Model of Determinant of Profitablily (Dependent Variable: ROA)

Variable	Coefficient	t-statistic	Probability
Prop_Stock	2.94	3.32	0.00*
Prop_Mutual	0.76	1.28	0.20
Prop_Gov	0.58	1.26	0.21
Prop_Property	-0.90	-0.57	0.57
Prop_Corporate	-0.78	-1.80	0.07
Ln_Asset	-0.23	-1.63	0.10
Cost_Ratio	-0.35	-3.43	0.00*
Funding_Ratio	-0.10	-0.50	0.62
Receivable_Ratio	-3.25	-2.95	0.00*
Growth	0.02	0.01	0.99
Inflation	-0.11	-0.04	0.97
Vol_JKSE	1.07	0.04	0.97
Vol_Xrate	-2.93	-0.03	0.97
D	-1.00	-0.03	0.97
Constant	6.91	0.21	0.84
R-squared	0.17	F-statistic	1.37
Adjusted R-squared	0.045	Prob(F-statistic)	0.00
Total panel (unbalanced) observations: 1358			
Note(s): *represents statistical significance at the five per cent level			

Table 2 shows that there are only three variables that significantly affect the profitability of pension fund companies. These three variables come from two groups of independent variables, they are the proportion of the portfolio investment and the specific company characteristics. In the portfolio investment group, the variable of stock ownership is the only variable that affects the level of profitability with a coefficient value

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of 2.94. It means that the higher the proportion of stocks owned by the company, the higher the company's profitability.

Meanwhile, two other independent variables that affect the level of profitability come from the group of specific company characteristics, including the cost ratio and receivable ratio. Both of them have a negative effect on the company's profitability. In other words, the higher the cost ratio owned by the company, the lower the resulting profitability. This has the implication that to encourage the profitability of pension fund companies, cost efficiency is required. The results of the analysis show a coefficient value of -0.35. This means that if the company is able to reduce the cost ratio by one percent, the company's profitability will increase by 0.35 percent.

The last variable that has a significant effect on profitability is the receivable ratio variable. The regression coefficient value of this variable is -3.19. This indicates that the higher the amount of receivables owned by the company, the lower the profit earned. Therefore, the large number of receivables owned by the company will have an impact on the increasing number of idle assets. The assets owned by the company should be used productively. However, if these assets are still included in receivables, this will have an impact on decreasing the company's profitability. This condition indicates the need for asset management o pension fund companies to minimize the number of idle assets.

Furthermore, there are eleven out of fourteen independent variables that have no significant effect on the level of profitability of pension fund companies. The majority of these variables come from the company's external variable group, they are macroeconomic variables and the Covid-19 outbreak. The Covid-19 dummy, which is one of the main focuses of this study, does not affect company profitability statistically. Although descriptively it shows a change in the profitability value of pension fund companies, especially the PPMP and DPLK groups, the change is not significant statistically.

The final part of this study comprehensively examine the impact of the Covid-19 outbreak on company profitability by adding the interaction variable between the Covid-19 dummy and the portfolio investment variables according to equation (2). The estimation results from the development model that explains the variables that affect the profitability of a pension fund compaies are as follows:

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Table 3. Estimation Result the Model of Extended Determinant of Profitablily (Dependent Variable: ROA)

Variable	Coefficient	t-statistic	Probability
Prop_Stock	2.97	3.34	0.00*
Prop_Mutual	0.98	1.60	0.11
Prop_Gov	0.67	1.43	0.15
Prop_Property	-1.04	-0.65	0.52
Prop_Corporate	-0.81	-1.85	0.06
Prop_Stock*D	0.62	0.54	0.59
Prop_Mutual*D	-1.52	-1.23	0.22
Prop_Gov*D	-0.64	-0.65	0.52
Prop_Property*D	1.18	0.69	0.49
Prop_Corporate*D	0.34	0.49	0.63
Ln_Asset	-0.23	-1.65	0.10
Cost_Ratio	-0.34	-3.31	0.00*
Funding_Ratio	-0.10	-0.53	0.60
Receivable_Ratio	-3.19	-2.88	0.00*
Growth	0.01	0.00	1.00
Inflation	-0.06	-0.02	0.98
Vol_JKSE	0.46	0.02	0.98
Vol_Xrate	-0.08	0.00	1.00
D	-0.45	-0.01	0.99
Constant	6.20	0.22	0.83
R-squared	0.17	F-statistic	1.35
Adjusted R-squared	0.04	Prob(F-statistic)	0.00
Total panel (unbalanced) observations: 1358			
Note(s): *represents statistical significance at the five per cent level			

Table 3 shows that by adding the interaction variable between the dummy variable and the portfolio investment, this condition does not change the results of the analysis in the previous section. The variables that have a significant effect on the profitability of pension fund companies are also the same, with directions and coefficient values that tend to be consistent. These variables are the portion of the stock portfolio to total investment, cost ratio, and leverage ratio.

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5. Conclusions

The results of the study show that during the 2013-2021 period, the investment portfolio chosen by pension fund companies has not changed significantly. Before the Covid-19, many pension fund companies chose deposits as investment instruments. However, after the Covid-19, the company's largest portfolio investment was Government Securities (SBN). Meanwhile, the portion of other investment instruments tends to remain the same. In terms of profitability, the return on investment tends to be stable. Even when Covid-19 occurred, ROI actually increased. However, in 2021, ROI has decreased slightly.

Statistically, it can be proven that the factors that affect the profitability of pension fund companies are more explained by the company's internal conditions, both portfolio portions or other specific indicators of the company. The portfolio investment component that has a significant effect on the profitability of pension funds is stock ownership. Although the stock portion as a whole is only about ten percent of the total investment, however, statistical results prove that the larger the portion of company's stock investment, the higher the company's profitability. The other internal variables that have a significant effect on profitability are the cost ratio and leverage ratio. Both have a negative effect on the level of profitability.

The final results of the study show that the company's external variables consisting of macroeconomic and Covid-19 variables, have no significant effect on profitability. After conducting various modeling, the results of the analysis show that Covid-19 has no effect on the profitability of pension funds, either directly or through changes in the pattern of the company's portfolio investment.

Based on the results of the study, there are several things that can be used as policy recommendations for both regulators and pension fund companies to increase company profitability. In order to increase company profits, appropriate policies are needed regarding the selection of investment instrument and asset management. In terms of selecting investment instruments, pension fund companies can choose investment instruments that provide high returns while still considering all the risks. Therefore, it is very important to understand the characteristics of each available investment instrument before making a decision. In addition, good asset management can also be considered as one of the policies that can increase company profits. Another thing to consider is increasing the efficiency of the company's operational costs. It is because the high ratio of operational costs can reduce the profits earned by the company. On the other hand, there are also several indicators that reflect the performance of pension fund companies, including liquidity and solvency. As financial intermediaries, pension fund companies need to maintain their liquidity and solvency to maintain overall financial system stability. Therefore, in the future, a study is needed to analyze the level of liquidity and solvency of pension funds in reflecting the company's performance and to identify the determinants of these two indicators.

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