

## **A Comparative Analysis Of Active And Passive Investing Strategies In Dana Pensiun XYZ (Dapen XYZ)**

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### **Abstract**

*The study aims to provide a comprehensive comparative analysis of active vs. passive investment strategies in the context of pension funds, aimed at providing insights into the dynamic discourse surrounding active and passive investment. Through an exploration of empirical data and scientific discourses, the study highlights the potential benefits and limitations of each strategy, ultimately contributing to the informed decision-making process for pension fund managers. The study will also use the Markowitz model and efficient boundary methods to analyze and optimize investment strategies, focusing on risk, cost and cost management, and investment strategy. The analysis will also provide insights that can be done for fund managers to target higher investment returns, in terms of influencing company decisions and behavior to implement long-term investment strategies by reallocating some assets to other investment strategies.*

**Keywords:** *Active, Passive, Investment, Markowitz*

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## **INTRODUCTION**

Pension funds play a crucial role in financial markets, managing significant assets to ensure long-term obligations for beneficiaries. These institutions face the challenge of adopting effective investment strategies to balance risk and return while meeting future liabilities. The study investigates the dynamic discourse surrounding active and passive investment in the context of pension funds, aimed at providing comprehensive comparative analysis. Through an exploration of empirical data and scientific discourses, the study highlights the advantages and limitations of each strategy, ultimately contributing to the informed decision-making process for pension fund managers.

Supporters who argue the potential to go beyond benchmarks support the active investment approach, characterized by a practical and market-hit approach. Supporters argue that skilled fund managers have the ability to identify undervalued assets and exploit market inefficiencies, potentially resulting in better returns for pension funds (González et al., 2013). However, critics warn of higher costs associated with active management, poor returns, and the challenge of consistently exceeding the performance of passive strategies in the long term (Millo et al., 2023).

Passive strategies, on the other hand, are grounded in the Efficient Market Hypothesis (EMH), which suggests that market prices reflect all available information, leaving limited opportunities for consistent outperformance (Fama, 1970). Studies have shown that passive strategies, particularly index funds, offer advantages such as lower fees, broader diversification, and reduced risk from human error (Bogle, 2014; Fama & French, 2010). Empirical evidence indicates that passive funds have outperformed many active funds when adjusted for costs, especially in long-term investment horizons (Bogle, 2014; Markov & Markov, 2022).

Recent research highlights the growing popularity of passive investments due to their resilience during market downturns and alignment with socially responsible investing (SRI). For instance, funds like SRI-KEHATI have demonstrated superior stability and returns compared to their active counterparts in emerging markets, underscoring the effectiveness of such strategies in institutional portfolios (Chen & Scholtens, 2018).

This study contributes to the discourse by applying the Markowitz model to evaluate the comparative performance of active and passive strategies within Dapen XYZ, a significant institutional investor. By analyzing 15 years of empirical data, the research aims to guide pension fund managers in optimizing asset allocation, balancing risk, and maximizing returns.

## RESEARCH METHODS

In this section dedicated to Research Methodology, a detailed and systematic approach is presented to explore the effectiveness of active vs. passive investment strategies in pension funds. It provides a clear roadmap, starting from the initial identification of research problems, progressing through extensive reviews of relevant literature, and detailed methods used for data collection and analysis. Special attention is paid to the unique contributions and new aspects of this study. According to Markowitz (1952), the foundation of Modern Portfolio Theory, the optimization of portfolios through balancing risk and return is crucial for achieving investment objectives in varying market conditions. Recent work by Tan (2023) highlights the practical application of the Markowitz model in constructing efficient portfolios and demonstrates its ability to optimize risk-return trade-offs even under volatile market conditions. This methodological framework is crucial to drawing meaningful conclusions and offering new insights into the debate about investment strategies in pension fund management.

### Data Collection Method

Quantitative data for this research includes historical return data for various active and passive investment portfolios. This data can be collected from financial databases, investment firms, or public financial reports.

The sources will include:

1. Financial Performance Data of Pension Funds: Quantitative data on total returns, risk metrics, and cost management from internal sources and financial databases such as Bloomberg, Morningstar, and the annual report of pension funds. This data is important for evaluating and comparing the financial performance of funds using active and passive strategies.
2. Market Reports: Analyze reports from financial market research companies to understand broader market trends that affect pension funds.

Each of these sources and methods are chosen because of their relevance and ability to provide data that deals with research problems from quantitative performance. These methods will allow for comprehensive analysis that addresses core research questions effectively.

### Data Analysis Method

The focus of this analysis lies on several financial ratios that provide a broader picture of the performance of active and passive funds. The two main variables included in the comparative analysis are the average return excess and the standard deviation. Given the nature of the research, the following methods and tools for data analysis are suitable:

- a. Descriptive Statistics: Summarize fund performance trends, focusing on mean returns, skewness, and kurtosis.
- b. Risk-Adjusted Metrics: Use the Sharpe Ratio (Sharpe, 1991) to evaluate risk-adjusted returns and the Information Ratio for benchmarking performance consistency.
- c. Markowitz Model: Apply Modern Portfolio Theory (Markowitz, 1952) to visualize efficient frontiers and optimize portfolio allocation.

The Markowitz model, the cornerstone of modern portfolio theory (MPT), is an effective quantitative method for financial modelling. It makes it possible to build a portfolio model that is optimized at a given level of risk, providing a balance between risk and return (Tan, 2023). Efficient boundaries, a concept derived from the Markowitz model, represent an optimal set of portfolios that offer the highest expected return for a specified level of risk. It is an important

tool in portfolio management, enabling investors to visualize their risk and return compromise and choose their optimal portfolio based on their risk tolerance (Parkinson, 2020). In the context of this paper, these methods will be used to analyze and optimize investment strategies, focusing on risk, cost and cost management, and investment strategy. The aim is to identify optimal asset allocation that can maximize returns while minimizing risk, providing valuable insights for investment decision-making.

## RESULT AND DISCUSSION

This section describes data analysis and descriptive statistical calculations of Socially Responsible Investment-Kehati (SKEhati) and Financial Times Stock Exchange-Russell Group Environmental, Social, and Governance (FTSE) equity returns to represent passive investments, as well as Schroder Dana Prestasi Plus (Schroder) and Panin Dana Maksima (Panin) to believe active investments. The data was taken from 2009-2024. Comparison of investment performance is calculated using the Sharpe ratio and Information ratio. The results of this chapter lead to recommendations for better investment strategies between active and passive investments.

### Descriptive Statistics

The study period ranging from June 2009 to May 2024 was chosen to capture market conditions. The study analyzes SKEhati, FTSE, Schroder, and Panin primarily to represent active and passive investment instruments. All the data related to the selected funds came from the Bloomberg terminal. The study also uses monthly returns from the Dapen XYZ general equity fund to support future recommendations. The result is a 15-year data set. However, previous research has shown that the effects may be ignored when analysing too long periods. Bartholdy & Peare (2005) studied this and found that monthly data for a period of up to 5 years had the most accurate and relevant results (Bartholdy & Peare, 2002). Therefore, an analysis will not only be performed over the entire sample period but also the following sub-periods:

- a. Subperiod 1: June 2009 – May 2014
- b. Subperiod 2: June 2014 – May 2019
- c. Subperiod 3: June 2019 – May 2024

Table 1 Descriptive Statistic

Period	Fund	Average	Skewness	Kurtosis	Standard Deviation
SRI-Kehati	2009-2014	0.2451	-0.0882	-0.9068	0.1788
	2014-2019	0.1098	0.2157	-1.2198	0.1367
	2020-2024	0.0462	-0.0260	-1.0700	0.1815
FTSE ESG	2009-2014	-	-	-	-
	2014-2019	0.0844	0.1916	-1.3400	0.1219
	2019-2024	0.0380	-0.3444	-0.7869	0.1739
Schroder	2009-2014	0.2286	-0.3054	-0.6557	0.1820
	2014-2019	0.0646	-0.2586	-0.9858	0.1091
	2019-2024	0.0098	-0.6810	-0.1930	0.1440
Panin	2009-2014	0.3193	-0.6344	-0.5323	0.2106
	2014-2019	0.0453	-0.7157	0.5112	0.1470
	2019-2024	0.0093	-0.2555	-1.0756	0.2004

The Average column in Table 1 shows the average annual return of all SKEhati and references. On average, the average return of passive investments (SKEhati, FTSE) over the last 5 years has better annual returns than active investment (Schroder and Panin). The Skewness

column on Table 1 shows that passive investment is more positive than active investments. The positive deviation indicates that there are more chances of achieving higher returns from average, although it also indicates greater risks than very positive outcomes.

The Kurtosis column presents a negative value for generally all investments both active and passive. On average, passive investments have a lower value than active investments. This means passive investment strategies are generally considered safer because they have a lower probability of returns.

In fund-specific analysis, SKEhati showed relatively stable average returns with increased volatility over time. Larger negative kurtosis values indicate a smoother distribution of returns. High standard deviations from the FTSE indicate significant volatility, especially in subsequent periods. Both negative skewness and kurtosis indicate distribution with smaller losses that are more frequent and less extreme values. Schroder also showed high volatility, especially in the previous period. Average returns are relatively low, and negative confusion and kurtosis indicate distribution with smaller losses more frequently. Panin showed the highest volatility among funds, with significant fluctuations in average returns. Negative aversion and kurtosis also indicate distribution with small losses that occur frequently.

Based on these statistics, he concluded that passive investments are generally superior to active investments.

### Sharpe Ratio

The Sharpe ratio provides a clear insight into the trade-off between the risk and return of a given asset. A higher Sharpe ratio results in an investor who is valued with an additional return for every little extra risk he takes. (Sharpe, 1991).

Table 2 Result of Sharpe Ratio

Fund	Subperiod		
	2009-2014	2014-2019	2019-2024
SRI-Kehati	0.8736	0.3073	-0.0786
FTSE ESG	-	0.1440	-0.1299
Schroder	0.7975	-0.0115	-0.3322
Panin	1.0344	-0.1520	-0.1682

Table 2 shows the Sharpe ratio of four different funds over three subperiods. The Sharpe ratios measure the return on investment adjusted to risk, with higher values indicating better performance over risk. SKEhati, despite a decline over time, has done better during the last two subperiods than any other fund. The FTSE showed strong performance in the initial period, but declined in the last period, although still better than both active investments. Schroder declined in the second period and continued to be the lowest among other funds until the last period. Panin experienced a significant decline in the second period and could not recover in the third period.

To repeat, the overall decrease in Sharpe's ratio over time indicates a risk-adjusted decline in performance for all four funds, with SKEhati performing relatively better in the last two subperiods, SKEhati, despite a decline over time, has done better during the last two subperiods than any other fund. FTSE showing strong initial performance but declining later, Schroder consistently underperforming, and Panin experiencing a significant decline and failing to recover. It shows that both passive investment strategies (SKEhati and FTSE) go beyond active investment. (Schroder and Panin).

### Information Ratio

The information ratio measures the risk-adjusted return compared to the benchmark. Average information evaluates portfolio manager performance, competence, and ability to generate returns above benchmarks. It is also used to assess performance consistency by tracking

errors. Tracking errors are standard deviations from excessive returns. A low tracking error implies that the portfolio consistently exceeds the benchmark, while a high launch error indicates that the returns are highly fuzzy and inconsistent.

Table 3 Result of Information Ratio

Fund	Benchmark	Sub-Period		
		2010-2014	2015-2019	2020-2024
SRI-KEHATI	FTSE ESG	-	0.0516	0.0131
	Schroder	0.0160	0.0913	0.0534
	Panin	-0.1021	0.1360	0.0307
FTSE ESG	SRI-Kehati	-	-0.0579	-0.0138
	Schroder	-	0.0445	0.0421
	Panin	-	0.0946	0.0184
Schroder	SRI-Kehati	-0.0156	-0.1144	-0.0673
	FTSE ESG	-	-0.0498	-0.0507
	Panin	-0.1152	0.0559	-0.0286
Panin	SRI-Kehati	0.0861	-0.1262	-0.0279
	FTSE ESG	-	-0.0783	-0.0160
	Schroder	0.0996	-0.0414	0.0206

Table 3 compares the information ratio of four benchmarks (SKEhati, FTSE, Schroder, and Panin) to each other over three subperiods. The table shows that SKEhati had a positive Information Ratio in all sub-periods but the first against Panin. FTSE consistently surpassed Schroder and Panin since its existence. Schroder has mixed performance but is generally below performance by others on the whole subperiod. Panin performed very well in the first period but was bad in the last ten years. To sum up, based on the cross-reference benchmark between funds in table IV.3, both passive investments (SKEhati and FTSE) exceeded the active investment (Schroder and Panin) in the entire subperiod. SKEhati is generally superior to any other fund.

#### Markowitz Model

Table 4 provides data for four portfolios (SKEhati, FTSE, Schroder, Panin) in three different sub-periods, showing expected annual returns, standard deviations, risk-free rates, and Sharpe ratios. This table implies that the second period has experienced a profound decline, mainly in active investment. The Sharpe ratio drops below zero. The third sub-Period shows the resistance trend in expected returns to funds overall, as there is a flu pandemic from 2020 to 2022. Despite the impact of the pandemic on the global economy, SKEhati and FTSE still have expected higher annual returns than Schroder and Panin. This gives a strong indication that passive investment is still a better choice in the last subperiod.

Table 4 Summary of portfolio optimization

	Expected Return	Standard Deviation	Risk-free	Sharpe
<b>Sub-Period 1 (2011-2016)</b>				
<b>SKEHATI</b>	24.51%	0.1788	6.25%	0.8736
<b>FTSE ESG</b>	-	-	-	-
<b>Schroder</b>	22.86%	0.1820	6.25%	0.7975
<b>Panin</b>	31.93%	0.2106	6.25%	1.0344
<b>Sub-Period 2 (2016-2020)</b>				
<b>SKEHATI</b>	10.98%	0.1367	6.25%	0.3073
<b>FTSE ESG</b>	8.44%	0.1219	6.25%	0.1440

<b>Schroder</b>	6.46%	0.1091	6.25%	-0.0115
<b>Panin</b>	4.53%	0.1470	6.25%	-0.1520
<b>Sub-Period 3 (2020-2024)</b>				
<b>SKEHATI</b>	4.62%	0.1815	6.25%	-0.0786
<b>FTSE ESG</b>	3.80%	0.1739	6.25%	-0.1299
<b>Schroder</b>	0.98%	0.1440	6.25%	-0.3322
<b>Panin</b>	0.93%	0.2004	6.25%	-0.1682

To show the optimization area using the Markowitz model, a fund allocation scenario is generated using a 5% allocation unit difference for each instrument on each sub-period. Thus, all possible combinations of allocation create risk-return areas to facilitate comparisons between the three periods visually.

The text box Efficiency limits for each period shows the optimal portfolio that offers the highest return for a particular level of risk. Comparing these limits can help identify the most favorable period for investments based on investor risk tolerance and return expectations.

Figure 1 shows in the first sub-period, higher returns associated with greater risk, as expected. The inclination shows a relatively balanced compromise between risk and return. The risk-return compromise is more apparent in the second subperiod, with higher returns that are much lower requiring lower risk compared to the first period. The second sub-period generally shows a broad portfolio spectrum with much lower risk and corresponding returns compared with the first subperiod. Lower returns are associated with a much wider range of risks, which indicates a more volatile market but very low asset performance during this subperiod. Risk and profit spreads in the second period have the lowest range of risk and moderate return potential, making it attractive to investors who do not like risk. While the third period has a wider risk, the range of returns is narrower and generally lower. So, no matter what the allocation option is, it's not suitable for risk-tolerant investors looking for higher returns.

Each period shows a different risk-return profile, reflecting different market conditions or asset performance. Investors can use this analysis to adjust their portfolio options to risk tolerance and return expectations for each period. Generally, the first subperiod serves aggressive investors who are willing to take higher risks for higher return potential, the second subperiod appears to be the most conservative, and the third subperiod offers a moderate approach with a lower risk-return ratio.

### **Business Solution**

Based on statistical descriptions, both SKehati and FTSE passive investment funds showed superior results in the overall period, although FTSE started from the second subperiod. Based upon cross benchmarks using information ratio, passive investments showed more positive value. This suggests passively invested is a better investment option. Also based on statistical descriptions, only SKehati can show a relatively stable average return on other funds with increased volatility over time. SKehati also shows a relative stable Sharpe ratio performance in all sub-periods, thus being superior among other fund.

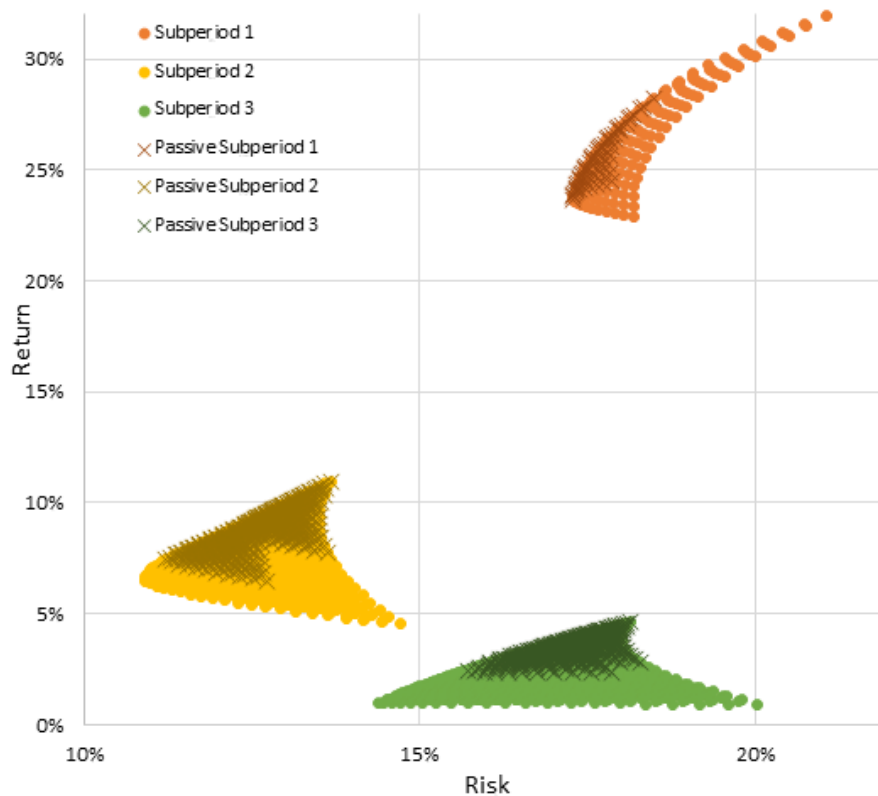


Figure 1 Overlay of passive investment on Markowitz mode

To validate passive investment risk and return, all possible combinations of fund allocation scenarios based on equal or more than 50% in passive investments, in both SKEhati and FTSE cases, are separated to highlight the areas. Figure 1 shows that the passive investment area in all subperiods is largely placed around the optimum investment curve of the Markowitz model. This figure also shows that there is a tighter area of passive investments in the last period. This means that recent passive investments have a more stable risk and return even though periods have a lower risk-return ratio. It validates an opportunity to enter a strategic position on passive investment for the near future.

Dapen XYZ, in accordance with the government's decision, was asked to gradually switch to fixed-income investment allocation from year to year. So, in the future, all investment allocations will be in fixed income. Right now, the transition process is ongoing. Meanwhile, the allocation of active and passive investments can be optimized. This optimization includes changing the investment ratio between active and passive investments, even reducing excessive costs.



Figure 2 Dapen XYZ management fees of active investment

By implementing active investments, Dapen XYZ has to pay management fees to fund managers as a percentage. Figure 2 shows that management costs increase overtime, although in line with returns. To cope with rising costs, active investment allocations can be transferred to passive investments by choosing the right instruments at the right time. Reducing large costs to get higher returns from other instruments will greatly improve portfolio performance. As current passive investment has a good time to enter, according to this study, Dapen XYZ can add its investment allocation this year. By gradually switching from active to passive investment, in this case by moving other allocations to more in SKehati, Dapen XYZ can optimize its portfolio.

The study recommends that Dapen XYZ should optimize its portfolio by starting the transition to gradually shift from active investment to passive investment by choosing the best instrument today, SKehati. It should start the transition effectively this year. (2024). The objective of the transition to passive investment is primarily to reduce the cost of large trends of active investments, and to long-term portfolio growth by adjusting the allocation of investments based on short-term analysis. The transition from active to passive investment can save more budgets, so that excessive budgets can be channeled to other profitable investment instruments, optimizing the return on investments. The transition should be gradual and should be analyzed monthly to monitor performance and to take emergency action if it does not meet expectations. The transition process can be started by Dapen XYZ's internal fund management team as soon as approved by the relevant stakeholders.

## CONCLUSION

Dapen XYZ, a pension fund company, has a portfolio of underperforming equity asset investments over the past five years. An analysis of investment strategies is needed to deal with this situation. For Dapen XYZ, an active investment strategy means handing over part of its investment to other fund managers at a certain cost based on a percentage of return. Meanwhile, passive investments require a much lower cost to make investments. Dapen XYZ, in accordance with the government's decision, is asked to gradually switch to fixed-income investment allocation every year and eventually all the investments will be in fixed income. Meanwhile, it is an obligation to maintain or even improve the performance of an investment portfolio.

The study provides a comprehensive comparative analysis of the active and passive investment approaches for Dapen XYZ to open up better opportunities in managing allocation decisions and optimizing long-term portfolio performance in the future. SKehati, FTSE,

Schroder, and Panin were chosen to represent active and passive investment strategies, while these are the most anticipated funds to invest. Fifteen years of data collected from Bloomberg was used for analysis. The data was divided into three subperiods of five years each to find the most accurate and relevant results.

The theoretical key to choosing the portion between active and passive investments is to analyze comprehensively and thoroughly. The study carried out comprehensive analysis through statistical performance comparison, Sharpe ratio comparison and cross benchmark using information ratio between instruments. To map performance in various market conditions and investor profiles, the Markowitz model was used to visually compare three different subperiods.

Based on investment performance statistics, passive investments are generally superior to active investments, to be more specific, SKehati shows a relatively stable average return with increased volatility over time. Sharpe's analysis also shows that passive investment can go beyond active investment, and SKehati has done better over the last 10 years. The cross benchmark of the information ratio validates that passive investments can actually outperform active investments, and indicates that SKehati is generally superior to other funds.

Based on the analysis of the Markowitz model, passive investment has a better optimal area to use as a case of investment allocation for more than 50% of allocation ratios, for all subperiods. Both SKehati and FTSE generally remain better options in the last subperiod. The Markowitz model on the three subperiods also shows areas with different risk-return profiles, reflecting different market conditions and investor profiles. Generally speaking, the first subperiod has higher risk returns than those normally used by aggressive investors. The second subperiod is suitable for conservative trading strategies. And the third subperiod tends to match a moderate approach because the risk-return ratio is lower.

Dapen XYZ to manage an active investment strategy reveals key factors that influence the choice between an active and a passive investment strategy. High annual costs can be a burden for the company, as budgets can be channeled to other instruments and get at least the same return on investment. The cost of these active instruments should be reduced, so the transfer of assets from active investments to passive instruments is the best option. Although it has to be done gradually.

The study provides insights that can be done for fund managers to target higher investment returns, in terms of influencing company decisions and behavior to implement long-term investment strategies by reallocating some assets to other investment strategy. A gradual asset allocation will create a direct impact on long-term asset management, including monitoring and benchmarking to suggest whether to stick to the current strategy or to change it later. This behavior is mainly related to the interests of my stakeholders in keeping the company profitable.

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