Journal of International Conference Proceedings (JICP)
Vol. 8 No. 4, pp.30-41, January, 2026
E-ISSN: 2621-993X P-ISSN: 2622-0989
https://ejournal.aibpmjournals.com/index.php/JICP/index

Analysis of Optimal Stock Portfolio Formation Using the Single Index Model Approach for Investment Decisions

Dewi Manggar sari[1*], Mutiara Audina[1], Carina Fantasia[1]
[1]Udayana University
P.B. Sudirman, Dangin Puri Klod, West Denpasar District, Denpasar City, Bali 80234, Indonesia
Correspondence Email: dewi02manggar@gmail.com[1]

ARTICLE INFORMATION

Publication information

Research article

HOW TO CITE
Sari, D. M., Audina, M., & Fantasia, C. (2025). Analysis of optimal stock portfolio formation using the single index model approach for investment decisions. *Journal of International Conference Proceedings (JICP)*, 8(4), 30-41.

DOI:
https://doi.org/10.32535/jicp.v8i4.4332

Received: 11 November 2025
Accepted: 14 December 2025
Published: 17 January 2026

ABSTRACT

The aim of this research is to explore the composition that results in an optimal investment portfolio from stocks listed in the IDXQ30 index using the Single Index Model (SIM). This research Time Frame covers January 2021 to December 2024, with 14 consistently listed stocks identified as the initial sample. According to the calculation of Excess Return to Beta (ERB) and the determination of the cut-off point (C*), six stocks were selected as portfolio candidates, namely BMRI, BBCA, UNTR, PTBA, CPIN, and ACES. The final results presented in the optimal weighting table reveal that only four stocks are belong to the optimal portfolio, comprising BMRI, BBCA, UNTR, and PTBA. The greatest portion of the fund allocation was achieved by BMRI at 44.43%, followed closely by BBCA at 44.06%. In contrast, UNTR and PTBA contributed smaller weights of 7.33% and 4.18%, respectively. This composition indicates that the financial sector, represented by BMRI and BBCA, dominates the optimal portfolio, while other sectors provide additional diversification. These findings emphasize that stocks with the highest efficiency in generating returns relative to risk are prioritized in portfolio construction, thereby producing an allocation that balances return potential and risk exposure.

Keywords: Optimal portfolio, Q30 index, single index model, investment decision, return and risk

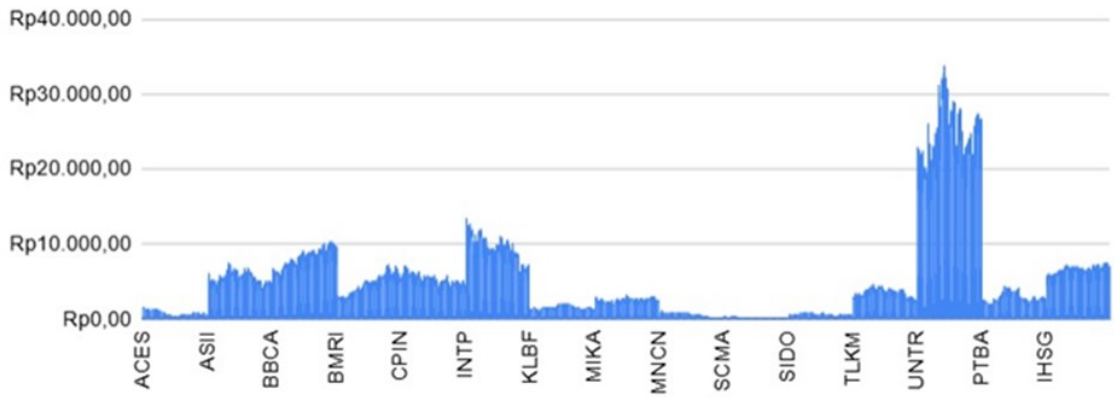
INTRODUCTION

Investment is the activity of deferring current consumption by allocating a certain amount of funds over a specified period into assets considered efficient by investors (Yanti et al., 2021). Investments made in a company can contribute to capital growth, as investors earn returns that may subsequently be reinvested as additional equity ownership (Gunawan et al., 2024). The capital market has become one of the preferred investment alternatives among investors, offering flexibility in selecting traded securities based on individual risk tolerance, fund availability, and investment horizon (Pratiwi, 2022). In the realm of investing, higher levels of risk are typically associated with higher minimum returns (Sriyono et al., 2021). As a result, stock market investors generally avoid placing all their funds in a single stock and instead diversify their investments across multiple stocks, aligning with Markowitz's adage: *"Don't put all your eggs in one basket."* This strategy aims to optimize returns while minimizing risk through diversification (Priyantono, Di Asih, & Utami, 2023).

One of the primary challenges investors face is making informed investment decisions in uncertain conditions. The greater the price fluctuation of a stock, the higher its risk level. Modern Portfolio Theory (MPT) encompasses a framework that guides investors in allocating capital across assets to accomplish an optimal trade-of between return and risk (Huda et al., 2022). One effective strategy to reduce risk is diversification (Yusup, 2022). Diversification entails constructing a portfolio formed by selecting a range of instruments assets that mitigate risk levels while safeguarding the potential for expected returns (Puspitasari, Febriyanto, & Ali, 2022). This study employs the SIM approach to build an optimal stock portfolio which maximizes returns while minimizing risk, thereby providing a rational basis for informed investment decision-making (Sugiarni, Hinggo, & Kinasih, 2021). The SIM is used to Identify what stocks are suitable for integration in a portfolio on basis of their excess return-to-beta values, allowing investors to make more targeted and efficient investment decisions (Wijayanto, Hidayatullah, & Prihatiningsih, 2023). Modeling the connection between stock returns and the single market factors allows investors to simplify the portfolio selection process and identify efficient asset combinations (Song, Li, & Fang, 2022).

In Indonesia, the Indonesia Stock Exchange (IDX) has actively undertaken innovations in developing and providing stock indices, both independently and in collaboration with other parties, for use by all capital market participants. The IDX serves as a trading platform provider for securities and offers several indices, including LQ45, IDX80, IDX30, IDXGROWTH30, and IDX Quality30 (IDXQ30), among others. Highly liquid stocks and major market capitalization are among the most actively traded, with substantial transaction volumes (Yanti et al., 2021). The SIM streamlines the portfolio formation process by considering that stock returns are influenced by a single market parameter, thereby facilitating risk analysis and correlation between stocks (Pananjady & Foster, 2021). The Single Index Model is considered an appropriate method, particularly when applied to leading stocks such as those listed in the IDXQ30 index during the 2021–2024 period. The SIM offers an efficient framework to portfolio construction by considering the correlation among individual equity performance and market performance. thereby minimizing unsystematic risk (Iguchi et al., 2021).

The IDXQ30 index reflects the price performance of 30 companies' stocks that able to delivered consistent profit gains, strong solvency, consistent earnings growth, active trading liquidity, and sound financial conditions. In the context of post-COVID-19 economic recovery, the IDXQ30 index serves as a relevant benchmark for investors to develop more selective and measured investment strategies. Therefore, applying the Single Index Model to stocks within the IDXQ30 index is expected to provide insights into an optimal portfolio that considers not only returns but also efficient risk management.



Source: www.idx.co.id

Referring to the report released by IDX, the average stock prices included in the IDXQ30 index declined from 2021 to 2024. This decline was triggered by post-pandemic global uncertainty, which led to reduced incomes, widespread layoffs, and more cautious financial management among individuals (Utina, Monoarfa, & Selvi, 2024). Amidst such conditions, investors require effective investment strategies to manage risk while still seeking optimal returns (Hidayat, Anggraini, Riyani, & Endri, 2022). The increase in the Jakarta Composite Index (JCI) throughout 2021 was partly driven by rising prices of stocks included in the IDXQ30 index (Putra & Warsini, 2022). In fact, the performance of the IDXQ30 index in 2021 showed a positive trend, increasing by 0.221 points, or 0.15% year-to-date (YTD), to reach 145.043 on December 30, 2021. Despite the overall decline in stock prices across sectors during 2021–2024, the IDXQ30 index demonstrated relatively better resilience compared to other indices, attributable to the financial strength, profitability, and corporate governance of its constituent companies.

When markets are under pressure due to global uncertainty, stocks with strong fundamentals tend to experience more controlled declines and greater potential for faster recovery (Uddin et al, 2021). Thus, the IDXQ30 index can serve as a reliable benchmark for investors in formulating defensive yet productive investment strategies. This highlights the importance of selecting assets based on fundamental analysis to navigate volatile market dynamics and supports the application of models such as the SIM in constructing an optimal and resilient stock portfolio (Gafur, 2024). The SIM is employed to identify stocks with the highest excess return-to-beta (ERB) values, facilitating the formation of an optimal and efficient portfolio that aligns alongside investor preferences (Abdullah et al., 2022).

An efficient portfolio delivers a certain rate of return accompanied by low risk or maximizes return at a predetermined level of risk (Sriyono et al., 2021). The SIM, brought forward by William F. Sharpe, is a streamlined version of the Markowitz model (Simorangkir, 2021; Amtiran, Kein, & Ndoen, 2021). This model illustrates the correlation between individual return securities and the return of the overall market index, making the portfolio construction process more practical and efficient compared to Markowitz's more complex framework.

Based on a review of previous studies, the use of the IDXQ30 index as the object of analysis remains relatively limited. Therefore, this study explicitly aims to construct an optimal portfolio of IDXQ30 stocks using the Single Index Model. The significance of this research lies in providing empirical evidence of IDXQ30 as a resilient benchmark during the post-COVID-19 recovery period. The novelty of this study lies in its focus on IDXQ30, which remains underexplored in the literature. Its contribution is to provide both

theoretical insights and practical guidance for investors and academics on managing portfolios more effectively amid global economic uncertainty.

LITERATURE REVIEW

Optimal Portfolio Theory

The concept of an optimal portfolio originates from Modern Portfolio Theory (MPT), brought forward by Markowitz, which emphasizes diversification as a means of balancing risk and return. An efficient portfolio delivers optimal return outcomes for a given risk threshold or lower intensity for a predetermined level of return. Previous studies in Indonesia have applied MPT and the Single Index Model to various stock indices, such as LQ45, IDX30, and JII30, to identify efficient asset allocations (Sriyono et al., 2021). These studies consistently highlight that diversification across sectors plays a key role in reducing portfolio volatility while maintaining attractive return potential.

Single Index Model (SIM)

The Single Index Model, introduced by William Sharpe, simplifies the complex covariance calculations required in Markowitz's model under the assumtion that fominant factor impacting stock return is market movements. Several researchers have applied this model in the Indonesian context. For instance, (Huda et al., 2022) analyzed the JII30 index, while (Gunawan et al., 2024) tested the LQ45 index, both confirming that the Single Index Model effectively identifies optimal portfolios with fewer computational complexities. In addition, (Putra & Warsini, 2022) applied the Single Index Model to the IDXQ30 index and found that only a subset of stocks with strong fundamentals were consistently included in optimal portfolios. The modern portfolio theory (MPT) developed by Harry Markowitz states that investors can form an efficient portfolio by blending various assets with different levels of return and risk (Simorangkir, 2021). Marketing refers to a managerial and societal mechanism through which people and communities fulfill their needs and desires by developing, delivering, and trading waluable offering with others (Amin, Mubyarto, & Siregar, 2024).

IDX Quality30 (IDXQ30) Index

The Indonesia Stock Exchange developed the IDXQ30 index to track companies with high profitability, strong solvency, stable earnings, and sound governance. Stocks listed in IDXQ30 are generally considered to have stronger resilience during uncertain economic periods, such as the post-COVID-19 recovery (Utina, Monoarfa, & Selvi, 2024). Prior research has emphasized that stocks within the IDXQ30 index tend to provide relatively stable returns compared to other indices, making them suitable objects for portfolio optimization studies (Pratiwi, 2022; Saputra et al., 2024). The IDXQ30 index was chosen because it consists explicitly of thirty companies with strong fundamentals, including high profitability, solid solvency, consistent earnings growth, sound governance, and active liquidity. Compared to broader indices such as LQ45 or IDX80, IDXQ30 applies stricter quality criteria, making it more relevant for analyzing risk-return efficiency and constructing an optimal portfolio. Its focus on "quality stocks" also ensures greater resilience in uncertain economic conditions, providing a more reliable basis for medium- to long-term investment strategies.

RESEARCH METHOD

Based on the research objectives, this study employs a descriptive method. The approach used is quantitative, as the research is grounded in numerical data and statistical analysis. The type of data utilized is secondary data, with an observation duration of four consecutive years, beginning in early 2021 and ending in late 2024 The study was conducted within this specific time frame, and stock closing price data were

extracted from http://www.investing.com. The stock data of companies analyzed that empirical evidence used in this study was collected from the verified IDX website (www.idx.co.id), with a specific focus on stocks consist from in the IDX Quality30 (IDXQ30) index.

To obtain the risk-free rate of return, the researcher used the benchmark interest rate from Bank Indonesia, specifically the BI 7-Day Reverse Repo Rate (BI7DRR), which was accessed through the official Bank Indonesia website at www.bi.go.id. The study used 14 stocks as the sample, selected through purposive sampling from the population of stocks that systematically remained in the IDXQ30 index over the course of the observation period. The selection of these samples was based on specific criteria aligned to conduct an optimal portfolio analysis. The list of sampled stocks used in this research is presented in detail in Table 1.

Table 1. Sample of Stocks

No	Stock Code	No	Stock Code
1	ACES (PT Ace Hardware Indonesia Tbk)	8	MIKA (PT Mitra Keluarga Karyasehat Tbk)
2	ASII (PT Astra International Tbk)	9	MNCN (PT Media Nusantara Citra Tbk)
3	BBCA (PT Bank Central Asia Tbk)	10	SCMA (PT Surya Citra Media TbK)
4	BMRI (PT Bank Mandiri (Persero) Tbk)	11	SIDO (PT Industri Jamu dan Farmasi Sido Muncul Tbk)
5	CPIN (PT Charoen Pokphand Indonesia Tbk)	12	TLKM (PT Telkom Indonesia (Persero) Tbk)
6	INTP (PT Indocement Tunggal Prakarsa Tbk)	13	UNTRPT (United Tractors Tbk)
7	KLBF (PT Kalbe Farma Tbk)	14	PTBA (PT Bukit Asam Tbk)

To address the research objectives, this study adopts the SIM as the analytical approach. This approach is chosen to facilitate a systematic process in constructing an optimal portfolio. The procedure for optimal portfolio analysis using the Single Index Model follows the stages, which include calculating returns and risk, as well as selecting stocks that offer the most efficient combination of return and risk.

1. The first step involves calculating the rate of return for each stock analyzed. This calculation is performed using the following formula to accurately determine the return of each stock: $R_T \frac{P_T - P_{T-1}}{P_{T-1}}$
2. The expected return E(Ri)E(R_i)E(Ri) is an estimate of the return expected to be received by an investor in the future or at period NNN. In this study, expected return is calculated as the average return of each stock over the entire observation period: $E(Ri) = \frac{\sum_{i=1}^{N} Rij}{N}$
3. The market return is calculated using the following formula: $R_m = \frac{IHSG_t - IHSG_t}{IHSG_{t-1}}$
4. The expected market return is calculated as: $E(Rm) = \sum_{t=1}^{N} \frac{(Rm - E\,(Rm))^2}{N-1}$
5. The covariance between Ri and Rm is computed using: $\sigma im = \sum_{t=1}^{N} \frac{[Ri - E(Ri).Rm - E(Rm)]}{N-I}$
6. The market variance is calculated using the following formula: $\sigma^2 m = \sum_{t=1}^{N} \frac{(Rm - E(Rm))^2}{N-1}$
7. The beta coefficient of stock III is calculated as: $\beta i = \frac{\sigma im}{\sigma m^2}$

$$\alpha i = E(Ri) - \beta i\,.E(Rm)$$

8. The alpha of stock III is computed using:
9. The residual error variance is given by: $\sigma ei^2 = \beta i^2 . \sigma^2 m + \sigma^2 im$
10. The excess return to beta (ERB) is calculated using: $ERB = \frac{E(Ri) - Rf}{\beta i}$
11. The values of AiA_iAi and BiB_iBi are computed as follows:

$$Ai = \frac{[E(Ri) - Rf . \beta i}{\sigma ei^2}$$

$$Bi = \frac{\beta i^2}{\sigma ei^2}$$

12. The cut-off rate CiC_iCi is computed as:

$$Ci = \frac{\sigma^2 m \sum_{j=1}^{i} \frac{(Ri - Rf)\beta i}{\sigma ej^2}}{1 + \sigma^2 m \sum_{j=1}^{i} (\frac{\beta i^2}{\sigma ei^2})}$$

13. The Z value (weight scale) is calculated as: $Zi = \frac{\beta i}{\sigma ei^2} (\frac{Ri - Rf}{\beta i} - C^*)$
14. The proportion of funds allocated to each stock is calculated using:

$$Wi = \frac{Zi}{\sum zj}$$

15. The expected portfolio return is calculated as: $E(Rp) = (\sum wi . \beta i) . E(Rm)$
16. The portfolio risk is computed using: $\sigma P^2 = (\sum Wi . \beta i)^2 . \sigma m^2 + (\sum Wi . \sigma ei^2)^2$

Journal of International Conference Proceedings (JICP)
Vol. 8 No. 4, pp.30-41, January, 2026
E-ISSN: 2621-993X P-ISSN: 2622-0989
https://ejournal.aibpmjournals.com/index.php/JICP/index

RESULTS

The table displays several key indicators, including Alpha, Beta, Residual Variance, Excess Return to Beta (ERB), Ci, C*, and the final decision on whether each stock qualifies as a portfolio candidate.

Statistical Results

Table 2. Optimal Portfolio Formation

Emiten	Alpha	Beta	Varian Residual	ERB	Ci	C*	Keputusan
ACES	-0,009052	-0,000348	0,106717	37,669331	0,0000003		Candidate
CPIN	-0,001987	-0,000470	0,063712	12,861518	0,0000009		Candidate
BMRI	0,013643	0,000959	0,061621	10,003779	0,0000029		Candidate
BBCA	0,008543	0,000607	0,042355	7,410675	0,0000041		Candidate
UNTR	0,007805	0,000957	0,094964	3,927016	0,0000044		Candidate
PTBA	0,006505	0,001086	0,101725	2,266349	0,0000046	0,0000046	Candidate
TLKM	-0,001173	0,000933	0,058980	-5,592603	0,0000035		Non-Candidate
ASII	-0,002305	0,000820	0,068637	-7,746593	0,0000026		Non-Candidate
INTP	-0,009124	0,000675	0,083505	-19,524160	0,000002		Non-Candidate
SIDO	-0,000852	0,000225	0,083744	-21,777333	0,0000014		Non-Candidate
KLBF	-0,000369	0,000179	0,049371	-24,681413	0,0000012		Non-Candidate
MIKA	-0,000697	0,000112	0,065105	-42,423057	0,0000011		Non-Candidate
SCMA	-0,014194	0,000345	0,111385	-52,879629	0,0000007		Non-Candidate
MNCN	-0,024639	0,000271	0,077560	-105,666740	-0,0000004		Non-Candidate

Alpha (α): Extra return beyond the market.
Beta (β): Sensitivity to market risk.
Residual Variance: Stock's unique risk.
ERB: Excess return per unit of Beta.
Ci: Individual stock cut-off rate.
C*: Overall cut-off point

Source: Processed Data (2025)

Among the 14 sample stocks, six companies ACES, CPIN, BMRI, BBCA, UNTR, and PTBA initially met the requirement as candidates because their ERB values exceeded the cut-off point (C* = 0.0000046). However, further analysis revealed that ACES and CPIN recorded negative Alpha values of –0.009052 and –0.001987, respectively. A negative Alpha indicates that these stocks would contribute unfavorably to the portfolio's expected return, thereby making them unsuitable for inclusion in the final optimal portfolio.

As a result, only four stocks BMRI, BBCA, UNTR, and PTBA were ultimately determined to form the optimal portfolio. BMRI shows the highest Alpha (0.013648), followed by UNTR (0.007805), PTBA (0.006505), and BBCA (0.008543), confirming their potential to generate positive contributions to portfolio performance. In contrast, the remaining stocks, such as TLKM, ASII, INTP, SIDO, KLBF, MIKA, SCMA, and MNCN, were excluded because their ERB values were below the cut-off point, indicating inefficiency in balancing risk and return.

In summary, the final optimal portfolio was formed by four stocks BMRI, BBCA, UNTR, and PTBA because they exhibited both positive Alpha values and ERB levels above the cut-off, justifying their selection as the most efficient investments within the IDXQ30 sample.

Table 3.Optimal Portfolio Weighting

Emiten	Zi	Wi
BMRI	2,53	0,44434820
BBCA	2,51	0,44057823
UNTR	0,42	0,07327893
PTBA	0,24	0,04179464

Note:
Zi: Relative contribution score of each stock.
Wi: Final portfolio weight (fund proportion).

The Zi values represent the relative contribution of each stock to the portfolio, while Wi indicates the final proportion of funds allocated to each stock. According to the findings, BMRI records the highest Zi value of 2.53, resulting in the most significant fund allocation of 44.43%. BBCA follows closely with a Zi of 2.51 and a portfolio weight of 44.06%. These results demonstrate that both BMRI and BBCA dominate the composition of the optimal portfolio, jointly accounting for nearly 89% of the total allocation.

UNTR and PTBA contribute smaller allocations of 7.33% and 4.18%, respectively, with Zi values of 0.42 and 0.24. Although their contributions are relatively minor compared to BMRI and BBCA, their inclusion is essential as they enhance diversification within the portfolio, thereby helping to mitigate overall risk.

DISCUSSION

The results highlight that only a limited number of stocks demonstrated positive expected returns, underscoring the challenge of finding consistently profitable investment opportunities in the IDX. Stocks such as BMRI, BBCA, UNTR, and PTBA stood out as strong candidates due to their relatively high expected returns, which align with investor objectives of maximizing returns while minimizing risks.

The optimal portfolio composition indicates a heavy concentration in BMRI and BBCA, reflecting their strong financial performance and stability. However, the presence of negative weights for ACES and CPIN suggests the theoretical possibility of incorporating short-selling strategies to improve portfolio efficiency. While short-selling is not always feasible in practice due to regulatory and market constraints, its inclusion in the model reflects potential diversification benefits (Jiang, 2022).

Risk assessment further reveals that stocks with lower residual variances, such as BBCA, provide greater stability within the portfolio (Nugraha et al, 2024). On the other hand, stocks with high residual variance, such as SCMA, are less attractive because they introduce higher uncertainty. The comparison of ERB values against the cut-off point (C*) also played a critical role in filtering viable stocks, ensuring that only those capable of generating excess returns relative to their risks were included.

Overall, the findings reinforce the usefulness of the Single Index Model in identifying efficient portfolios by balancing expected returns and risks. For investors, the results suggest that focusing on stocks with strong fundamentals and lower risk can significantly enhance portfolio performance, although external market dynamics and practical trading limitations must also be taken into account.

CONCLUSION

This study concludes that the application of SIM provides a practical approach for identifying and constructing an optimal portfolio from stocks listed in the IDXQ30 index. Out of the 14 companies consistently included in the IDXQ30 during the period 2021–2024, only six stocks initially qualified as candidates for portfolio construction. From these, four stocks BMRI, BBCA, UNTR, and PTBA were ultimately included in the final optimal portfolio composition. The results indicate that BMRI and BBCA, both from the financial sector, dominate the allocation with nearly 89 percent of the total fund proportion, underscoring the leading role of the financial sector in generating efficient returns. Meanwhile, UNTR from the industrial sector and PTBA from the energy sector serve as supporting stocks, providing additional diversification while contributing positively to portfolio performance.

The findings imply that investors should prioritize stocks with high efficiency in generating returns relative to risk, particularly those from the financial sector, when constructing a medium- to long-term portfolio strategy. The concentration in BMRI and BBCA demonstrates the resilience and attractiveness of financial institutions in the IDXQ30 index, especially during the post-pandemic recovery period. At the same time, diversification into other sectors, although smaller in allocation, remains essential to mitigate portfolio risk and strengthen stability.

For future research, extending the observation period to 2025 and beyond, or applying alternative portfolio optimization models such as the Markowitz model or Value at Risk simulations, would provide further insights into dynamic investment strategies. Researchers are also encouraged to expand analysis to include macroeconomic factors, ESG indicators, or sectoral comparisons, which may enhance the applicability of findings for both academics and practitioners in capital market decision-making.

ACKNOWLEDGMENT

The authors, Dewi Manggar Sari[1], Mutiara Audina[2], and Carina Fantasia[3], would like to express their sincere gratitude to Dr. Gerianta Wirawan Yasa, S.E., M.Si., for his invaluable guidance, constructive feedback, and continuous support throughout the completion of this research. His expertise and encouragement have been essential in

shaping the quality and direction of this study. The authors also extend appreciation to all individuals and institutions who have contributed, either directly or indirectly, to the successful realization of this work.

DECLARATION OF CONFLICTING INTERESTS

The researchers affirm that no conflicts of interest exist concerning the study its authorship, or its publication.

REFERENCES

Abdullah, S., Huda, M., Chasanah, S. I. U., Mursyidah, H., Ikhsan, F., Susilo, S., … Boy, K. D. V. (2022). Implementasi model indeks tunggal dalam pembentukan portofolio optimal pada saham syariah MES BUMN 17 periode new normal. *Journal of Mathematics Education and Science*, 5(2), 157–163.

Amin, M. F., Mubyarto, N., & Siregar, E. S. (2024). Analisis pembentukan portofolio optimal saham menggunakan pendekatan single index model. *Ebisnis Manajemen*, 2(2), 41–56.

Amtiran, P. Y., Kein, M. Y., & Ndoen, W. M. (2021). Analisis portofolio optimal dengan menggunakan model indeks tunggal. *Jurnal Akuntansi*, 10(1), 86–97.

Gafur, A. (2024). Pembentukan portofolio optimal investasi menggunakan model Markowitz dan model indeks tunggal pada aset bebas risiko dan aset berisiko. *Journal of Management and Innovation Entrepreneurship*, 1(2), 228–245.

Gunawan, A., Fajriyah, R., Bimakasa, M. A., & Untari, S. N. (2024). Analysis of portfolio formation on the LQ45 stocks index using the Markowitz and single index models. *BAREKENG: Jurnal Ilmu Matematika dan Terapan*, 18(4), 2363–2374. https://doi.org/10.30598/barekengvol18iss4pp2363-2374

Hidayat, R., Anggraini, D., Riyani, Y., & Endri, E. (2022). Optimal sharia portfolio selection to outperform the stock market in the post-pandemic era. *Calitatea*, 23(187), 287–294.

Huda, M., Abdullah, S., Chasanah, S. I. U., Mursyidah, H., Ikhsan, F., Susilo, S., & Sukandar, R. S. (2022). Analisis pembentukan portofolio optimal saham-saham JII30 dengan model indeks tunggal periode new normal. *Jurnal Derivat: Jurnal Matematika dan Pendidikan Matematika*, 9(1), 32–46.

Iguchi, T., Barrientos, A. F., Chicken, E., & Sinha, D. (2021). Nonlinear profile monitoring with single index models. *Quality and Reliability Engineering International*, 37(7), 3004–3017. https://doi.org/10.1002/qre.2936

Jiang, H., Habib, A., & Hasan, M. M. (2022). Short selling: A review of the literature and implications for future research. *European Accounting Review*, 31(1), 1–31. https://doi.org/10.1080/09638180.2021.1938812

Nugraha, E. S., Savera, T., Sudding, F. N. F., & Yudhanegara, M. R. (2024). Analysis of value at risk of optimal portfolio forming using single index model on LQ45 stock index in 2018 and 2019. *FIRM Journal of Management Studies*, 9(2), 170–184.

Pananjady, A., & Foster, D. P. (2021). Single-index models in the high signal regime. *IEEE Transactions on Information Theory*, 67(6), 4092–4124. https://doi.org/10.1109/TIT.2021.3063486

Pratiwi, B. W. D. (2022). Analisis pembentukan portofolio optimal saham indeks LQ45 dengan model indeks tunggal di Bursa Efek Indonesia. *Journal of Management Economics and Accounting*, 1(1), 1–10.

Priyantono, V. R. A., Di Asih, I. M., & Utami, I. T. (2023). Analisis portofolio optimal menggunakan model indeks tunggal dan pengukuran value at risk dengan simulasi Monte Carlo (Studi kasus: Exchange Traded Fund di Bursa Efek Indonesia periode Januari 2021–Juni 2022). *Jurnal Gaussian*, 12(2), 158–165.

Puspitasari, A. D., Febriyanto, F., & Ali, K. (2022). Analisis pembentukan portofolio optimal di masa pandemi Covid-19 pada saham LQ45 tahun 2020–2021 dengan menggunakan model indeks tunggal. *Derivatif: Jurnal Manajemen*, 16(2), 307–314.

Putra, R. S. G., & Warsini, S. (2022). Pembentukan portofolio optimal saham pada indeks IDX Quality 30 menggunakan pendekatan single index model tahun 2022. *Seminar Nasional Akuntansi dan Manajemen PNJ*.

Saputra, A. S., Meylani, M., Nurfauziah, N., & Gunardi, A. (2024). Optimizing ESG leaders' stock portfolio on the Indonesia Stock Exchange (IDX): A single index model analysis (2020–2023). *E3S Web of Conferences*, 444, 02010. https://doi.org/10.1051/e3sconf/202444402010

Simorangkir, L. (2021). Analisis perbandingan kinerja antara portofolio optimal model Markowitz dan model indeks tunggal. *Jurnal Akuntansi dan Bisnis Krisnadwipayana*, 8(3), 1–15.

Song, Y., Li, Z., & Fang, M. (2022). Robust variable selection based on penalized composite quantile regression for high-dimensional single-index models. *Mathematics*, 10(12), 2000. https://doi.org/10.3390/math10122000

Sriyono, D. P., Prapanca, D., & Oktaviani, A. (2021). Pengambilan keputusan investasi portofolio: Pendekatan model indeks tunggal saham. *Jurnal Manajemen dan Bisnis*, 6(2), 72–96.

Sugiarni, W., Hinggo, H. T., & Kinasih, D. D. (2021). Analisis perbandingan hasil pembentukan portofolio optimal antara model Markowitz dan model indeks tunggal (Studi kasus indeks LQ45 di Bursa Efek Indonesia). *ECOUNTBIS: Economics, Accounting and Business Journal*, 1(1), 182–197.

Uddin, M., Chowdhury, A., Anderson, K., & Chaudhuri, K. (2021). The effect of COVID-19 pandemic on global stock market volatility: Can economic strength help to manage the uncertainty? *Journal of Business Research*, 128, 31–44. https://doi.org/10.1016/j.jbusres.2021.01.021

Utina, U., Monoarfa, M. A. S., & Selvi, S. (2024). Evaluasi dampak profitabilitas dan leverage terhadap harga saham pada perusahaan IDX Quality30 periode 2020–2022. *JAMBURA: Jurnal Ilmiah Manajemen dan Bisnis*, 7(1), 487–497.

Wijayanto, E., Hidayatullah, M. I., & Prihatiningsih, P. (2023). Pembentukan portofolio optimal saham berdasarkan model Markowitz dan model indeks tunggal pada perusahaan IDX BUMN20 tahun 2017–2021. *JSHP: Jurnal Sosial Humaniora dan Pendidikan*, 7(2), 122–132.

Yanti, M. D., Binangkit, I. D., & Siregar, D. I. (2021). Analisis portofolio optimal dengan menggunakan model indeks tunggal pada perusahaan indeks IDX30 periode 2017–2020. *ECOUNTBIS: Economics, Accounting and Business Journal*, 1(1), 235–249.

Yusup, A. K. (2022). Mean-variance and single-index model portfolio optimisation: Case in the Indonesian stock market. *Asian Journal of Business and Accounting*, 15(1), 79–109. https://doi.org/10.22452/ajba.vol15no1.4

ABOUT THE AUTHOR(S)

1st Author
Dewi Manggar Sari completed her undergraduate studies at Universitas Sriwijaya, Faculty of Teacher Training and Education, majoring in Economic Education. She is currently pursuing a Master's degree in Accounting at Udayana University, Faculty of Economics and Business. Her research interests include portfolio management, investment analysis, and financial accounting. She can be reached via email at dewi02manggar@gmail.com

2nd Author
Mutiara Audina earned her Bachelor's degree in Accounting from Universitas Negeri Medan, Faculty of Economics. She is currently pursuing a Master's degree in Accounting at Udayana University. Her academic background has equipped her with knowledge in financial reporting, auditing, and corporate governance. She has a strong interest in the areas of financial analysis and investment decision-making. She can be contacted through email at mutiaraaudina13@gmail.com

3rd Author
Carina Fantasia obtained her undergraduate degree in Accounting from Universitas Pendidikan Nasional, Faculty of Economics and Business. She is currently pursuing a Master's degree in Accounting at Udayana University. She has an academic background in accounting and finance, with a particular interest in capital markets and financial management. She is available via email at carinafantasia2@gmail.com