

Profitability Impact Of Reducing Coal Lending Exposure: A Scenario Analysis of Bank Permata's Sample Loan Portfolio

Aditya Nugraha^{1*}, Yunieta Anny Nainggolan²

School of Business and Management, Institut Teknologi Bandung^{1,2}

*Email: aditya_nugraha@sbm.itb.ac.id

Abstract

The global shift toward a low-carbon economy has intensified regulatory, market, investor, and societal pressures on banks to align lending portfolios with sustainable finance principles. In Indonesia, where coal remains central to the energy mix, banks face a strategic trade-off between sustaining profitability from coal financing and complying with green taxonomy requirements. This study evaluates the profitability implications of the coal sector phase-out for Bank Permata, a leading Indonesian commercial bank, and examines mitigation strategies. The analysis integrates Signaling Theory, Resource Dependence Theory, Stakeholder Theory, and Sustainable Finance to frame the strategic, risk, and stakeholder considerations in portfolio reallocation. A quantitative scenario analysis was applied to four publicly listed coal companies with existing credit facilities at Bank Permata, which were selected as a sample. Using a profit planning approach, financial projections were developed for income statements, balance sheets, and cash flows based on public disclosures and validated assumptions. Results were compared across a baseline (no phase out) and three phase out scenarios, with the most stringent targeting zero exposure by 2030. Findings indicate that phasing out in the short term will affect declines in interest income, driven by reduced loan balances and yields, but highlight long-term benefits through reduced regulatory non-compliance risk and lower reputational exposure to transition risks. Potential losses can also be mitigated by reallocating to green taxonomy-aligned sectors with competitive yields. The research offers a replicable scenario-based modeling framework for quantifying the financial effects of coal phase-out strategies in emerging market banking. It underscores the importance of strategic portfolio realignment, diversification into sustainable sectors, and strengthened ESG risk assessments to maintain profitability while supporting national and global sustainability goals.

Keywords: Coal Financing, Sustainable Finance, Green Taxonomy, Scenario Analysis, Loan Portfolio

A. INTRODUCTION

The accelerating global transition toward a low-carbon economy has intensified regulatory directives and market pressures on financial institutions to align their business models with sustainable finance principles. Indonesia, with its heavy reliance on coal in the national energy mix, places banks in a unique position. On one hand, coal-related financing remains profitable; on the other, evolving sustainability frameworks, such as the Indonesian Green Taxonomy (IGT), demand alignment with climate risk mitigation and environmental objectives. This duality presents strategic challenges for banks, especially in managing loan portfolios that balance profitability with long-term sustainability compliance.

Existing literature emphasizes the role of sustainable finance in supporting environmental objectives while maintaining financial performance. Theoretical perspectives, such as Signaling Theory, suggest that a bank's credit portfolio composition signals its commitment to sustainability to stakeholders. Resource Dependence Theory highlights the strategic risk of overexposure to a single sector, while Stakeholder Theory underscores the need to balance the diverse interests of shareholders, regulators, clients, and the public. Previous studies largely address the qualitative implications of coal phase-out policies, but there is limited empirical analysis on their direct profitability impact for Indonesian banks, particularly through quantitative scenario analysis.

The central problem addressed in this research is the potential impact on the profitability of Indonesian banks when reducing exposure to coal-related lending. Using Bank Permata as the case study, the research examines how such a portfolio adjustment could influence financial outcomes under various scenarios, while also identifying mitigation strategies to maintain competitiveness and regulatory compliance.

* Corresponding author

The purpose of this article is to present a focused analysis of the financial implications for Bank Permata of reducing coal sector exposure, applying scenario analysis to a sample loan portfolio. The study aims to contribute to the literature on sustainable finance in Indonesia by providing empirical evidence that integrates theoretical perspectives, regulatory requirements, and market realities.

B. METHODS

This study applies a quantitative research approach, employing scenario analysis and profit planning to assess the financial impact of reducing coal sector lending exposure. The method integrates empirical financial data from selected borrower companies with modeled loan portfolio adjustments under varying exposure reduction scenarios. The research focuses on Bank Permata's corporate loan portfolio in the mining sector, specifically coal-related lending. Four publicly listed coal companies with disclosed banking facilities from Bank Permata were selected as the representative sample. This selection reflects a material share of the bank's mining exposure and provides sufficient publicly available financial data for projection modeling.

The research was conducted in sequential steps:

1. Sample Selection – Identification of four publicly listed coal companies with confirmed Bank Permata credit facilities through public disclosures and financial statements.
2. Data Gathering – Extraction of financial data, operational metrics, and lending information from company annual reports, quarterly reports, investor presentations, and Bank Permata's sustainability disclosures.
3. Scenario Development – Formulation of three exposure reduction scenarios (light, moderate, and aggressive) aligned with regulatory green taxonomy targets.
4. Financial Projection – Construction of borrower-level financial forecasts under each scenario using historical trends and company-specific assumptions.
5. Portfolio Impact Analysis – Aggregation of borrower results to estimate portfolio-level interest income, profitability changes, and loan portfolio implications.

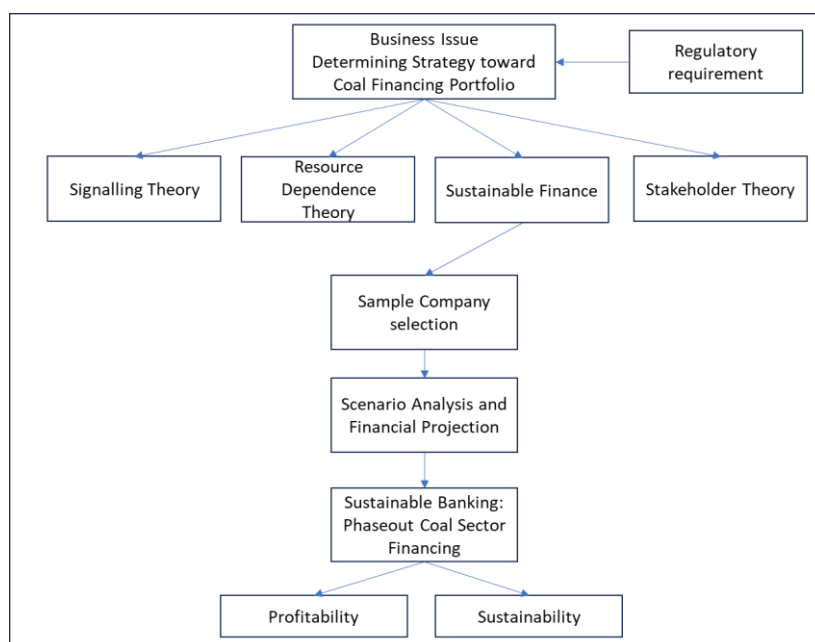


Figure 1. Research Framework

Source: Research data, 2025

The primary materials were company financial reports, Bank Permata sustainability reports, Indonesian Stock Exchange filings, and regulator-issued taxonomy guidelines. Analytical instruments included spreadsheet-based financial models capable of adjusting revenue, cost, and capital parameters in line with scenario inputs. Data were collected exclusively from publicly available, audited sources to ensure reliability. Quantitative analysis involved calculating projected income, yield changes, and capital

adequacy impacts under each scenario. This research is intended to propose a financing strategy for Bank Permata's coal loan portfolio using publicly listed coal mining clients as the sample set. The sample of four companies was selected to balance the depth of financial modeling with the representativeness of Bank Permata's coal lending exposure. These companies constitute a significant portion of the bank's corporate mining portfolio, ensuring that results meaningfully reflect potential profitability impacts without excessive data dilution from smaller, less material borrowers. The analysis will include projecting each client's business potential over a 10-year horizon to 2035, with a phasing-out scenario from the bank in 2030. The 2030 horizon was chosen to align with regulatory and sustainability milestones, notably Indonesia's Green Taxonomy and NDC targets, while providing a realistic period to assess the cumulative financial effects of coal portfolio reduction. The research quantifies the financial impact to the bank if the loan exposure is shifted from coal to other alternative sectors, with the objective of identifying the transition option that maximizes risk-adjusted returns and sets a forward financing strategy. The research employs the conceptual framework shown in Figure 1.

C. RESULTS AND DISCUSSION

The evaluation of Bank Permata's loan portfolio indicates a diversified corporate lending structure, with mining and quarrying loans constituting a notable proportion. Within this segment, coal-related exposures remain a significant component, reflecting both the sector's historical profitability and contribution to the bank's lending book. Coal financing continues to form a material share of its mining portfolio; however, publicly available disclosures and sustainability reports confirm that the bank has acknowledged climate-related risks. Lending from the coal sector heightens exposure to climate transition risks, regulatory tightening, and potential reputational challenges. Indonesian Green Taxonomy framework issued by the Financial Services Authority further elevates the urgency for the bank to evaluate the long-term sustainability of this lending segment.

Focusing on the four selected sample companies, all are publicly listed coal producers with confirmed Bank Permata credit facilities. These companies represent a substantial portion of the bank's coal-related lending and exhibit diverse operational scales, production volumes, and market positioning. Financial projections for each company, developed using historical performance data and scenario-based assumptions, reveal that reductions in coal lending exposure would directly affect interest income from these borrowers to the bank. The magnitude of the impact varies across the scenarios, with more aggressive reductions leading to sharper declines in interest revenue.

The following are the three scenarios that applied in this research: 1) Scenario 0: Coal Portfolio exposure remains unchanged; 2) Scenario 1: Coal Portfolio exposure will be reduced to 50% by 2030; 3) Scenario 2: Coal Portfolio exposure will be reduced to 75% by 2030; 4) Scenario 3: Zero Coal Portfolio exposure by 2030.

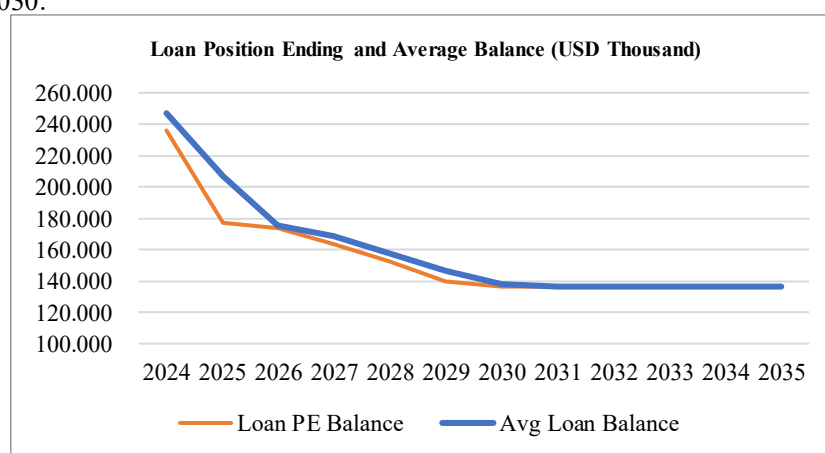


Figure 2 Projected Aggregated Loan Balance to Bank Permata

Source: Research data, 2025 (in thousands rupiah)

The projections carried out resulted in an estimate of the loan balance position of the four sample companies, as shown in Figure 2. Based on the assumptions and available bases, it is predicted that the balance of the loan outstanding in the baseline scenario will experience a decline in the coming years, this

is due to the financing needs of coal companies that can be met from its self equity, especially with the accumulation of cash build up after the price of coal experienced an increase several years ago, and the projection of increasing coal production from each company is not as aggressive as in previous years considering the projected national coal production is anticipated to be flat in line with government policy. In addition, the number of lenders, especially from local banks, to the Coal sector is seen to be increasing, so that the portion of financing to each bank will decrease as new banks enter as lenders.

Based on the projection results as shown in Table 1, the loan balance value of the four sample companies is expected to decrease. In addition, loan yield is also projected to decrease from 5.74% pa in 2026 to 4.73% in 2030, which is partly due to the direction of the USD benchmark interest rate movement.

Table 1. Projected Income From Loan-Baseline

Description	2025	2026	2027	2028	2029	2030
Avg Loan Balance	206.726	175.512	168.312	157.770	146.033	137.978
Interest Income	10.803	10.078	9.019	8.136	7.124	6.523
Yield	5,23%	5,74%	5,36%	5,16%	4,88%	4,73%

Source: Research data, 2025 (in thousands rupiah)

By calculating the projected loan balances of the four sample companies and projecting the yields on these loans to the bank, a simulation was conducted to measure the amount of interest income generated for the bank during the projection period. The reduction in coal sector exposure directly impacted the bank's interest income, as shown in Figure 3 below.

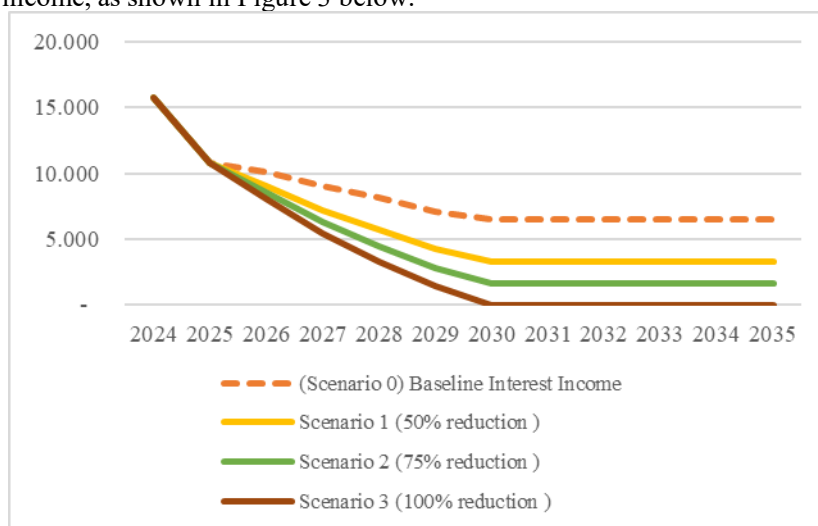


Figure 3 Interest Income Projection under Various Scenarios

Source: Research data, 2025 (in thousands rupiah)

When aggregated at the portfolio level, the scenario analysis shows a clear trade-off between reducing coal exposure and maintaining profitability. Under lighter reduction scenarios, the decline in interest income remains modest, offering the bank time to reallocate capital toward alternative sectors. In contrast, aggressive reduction scenarios result in significant profit compression unless offset by strategic reinvestment in sustainable, high-yield segments. These findings directly address the research objective by quantifying the financial implications of aligning the loan portfolio with sustainability goals.

In relation to existing studies, the results are consistent with international literature, such as research on coal phase-out strategies by major global banks, which underscores the profitability challenge of reducing fossil fuel exposures without a robust transition strategy. Like those studies, this research confirms that a gradual, well-planned reduction in coal financing can mitigate income losses and support regulatory alignment. However, differences emerge in the local context: Indonesian coal producers have, in recent years, delivered exceptionally high returns due to favorable market prices, making the short-term opportunity cost of portfolio reallocation higher than in more diversified or declining coal markets abroad. This underscores the importance of context-specific strategies, as a uniform application of global reduction timelines may lead to disproportionate profitability impacts in emerging markets like Indonesia.

Figure 4 illustrates the potential cumulative loss of interest income over the projection period for each scenario. Based on the projection, the cumulative loss of interest income in the most aggressive scenario (scenario 3) through 2035 is USD 55.3 million. The highest annual loss of interest income is

USD 6.5 million. Compared to Permata Bank's interest income in 2024, which is equivalent to USD 919.59 million, the decline in interest income is insignificant, representing only 0.71% of the bank's total interest income in 2024.

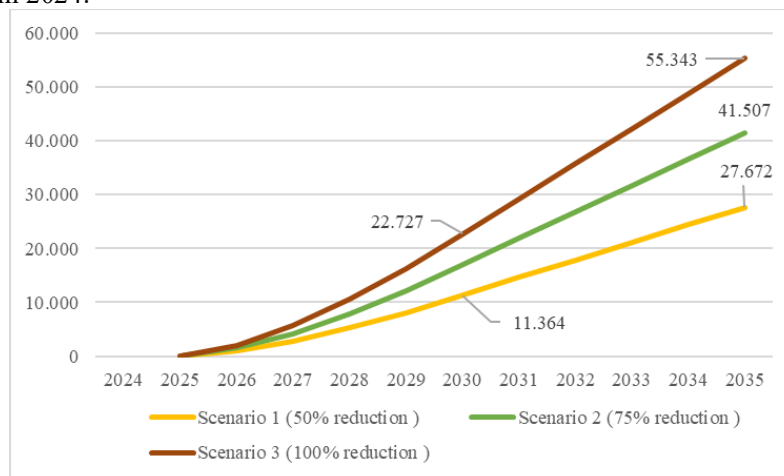


Figure 4. Accumulated Interest Income Loss

Source: Research data, 2025 (in thousands rupiah)

The findings validate the hypothesis that reducing coal exposure has measurable financial consequences but also demonstrate that strategic timing, phased implementation, and sectoral diversification are critical to managing both profitability and compliance with sustainability frameworks.

D. CONCLUSION

This research is based on increasing pressure from regulators, investors, and the public on banks to adjust their loan portfolios to align with sustainability principles, particularly in the coal sector, which is shifting to taxonomy-aligned financing. The research question is to what extent the reduction in coal financing portfolios has an economic impact on banks and how banks can manage the risks that may arise. Using a quantitative approach, this research conducted scenario analysis with financial projections on a sample of companies selected from public company customers, measuring the economic impact of phase-out scenarios under several scenarios. The research results indicate that reducing exposure to the coal sector does have an economic impact on banks in the short term, but the risk of decreased revenue is measurable and can be mitigated. In addition, in the long term, this strategy can mitigate regulatory, reputational, and market risks, providing resilience to banks.

Further research that can be conducted in relation to this study includes an evaluation of the coal loan replacement sector, capital reallocation strategies from coal loan phase-outs, and a study on the correlation of lending to companies with other non-lending business relationships that can be useful for determining coal sector phase-out strategies for banks. This is quite important considering that, apart from credit relations, the coal sector also provides business contributions beyond bank loans.

Disclosure and Ethical Statement

This research exclusively utilizes secondary data obtained from publicly available sources, including corporate financial reports, regulatory publications, and industry analyses. No confidential or proprietary information was accessed. Company names mentioned (including PT Bank Permata Tbk and associated coal sector clients) are referenced solely for academic analysis based on published data. The authors assert compliance with ethical research standards and affirm that no undisclosed or insider information was employed in the preparation of this manuscript.

REFERENCES

Aditya, I. A., Wijayanto, T., & Hakam, D. F. (2025). Advancing renewable energy in Indonesia: A comprehensive analysis of challenges, opportunities, and strategic solutions. *Sustainability*, 17(5), 2216. <https://doi.org/10.3390/su17052216>

- Asian Development Bank. (2024). Annual portfolio performance review 2024. <https://www.adb.org/sites/default/files/institutional-document/1048051/appr-2024.pdf>
- Baek, S., & Kang, M. (2025). Does ESG enhance asset quality and funding cost management in banking diversification? *Finance Research Letters*, 73, 106542. <https://doi.org/10.1016/j.frl.2024.106542>
- Bachtiar, A., & Nainggolan, Y. A. (2023). Financing for sustainability and bank performance: Case of G-20 countries. *International Journal of Current Science Research and Review*, 6(5), 2924–2936. <https://doi.org/10.47191/ijcsrr/V6-i5-30>
- Climate Policy Initiative. (2022). Climate-aligned investments and policy nexus in Indonesia. <https://www.climatepolicyinitiative.org/publication/climate-aligned-investments-and-policy-nexus-in-indonesia/>
- Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of Management Review*, 14(4), 532–550. <https://doi.org/10.5465/amr.1989.4308385>
- Financial Services Authority of Indonesia. (2017). *Regulation of the Financial Services Authority Number 51/POJK.03/2017 concerning the implementation of sustainable finance for financial-services institutions, issuers, and public companies*. Jakarta, Indonesia: Financial Services Authority.
- Financial Services Authority of Indonesia. (2022). Indonesia green taxonomy: Edition 1.0 (Taksonomi Hijau Indonesia edisi 1.0). Jakarta, Indonesia: Financial Services Authority.
- Financial Services Authority of Indonesia. (2024). Climate Risk Management & Scenario Analysis for the Banking Sector (Books 1–6). Department of Banking Regulation and Development, Financial Services Authority (OJK). <https://www.ojk.go.id>
- Freeman, R. E. (1984). *Strategic Management: A Stakeholder Approach*. Boston: Pitman.
- Gitman, L. J., & Zutter, C. J. (2015). *Principles of managerial finance* (14th ed.). Pearson.
- International Finance Corporation. (2017). Women-owned SMEs: A business opportunity for financial institutions. World Bank Group. <https://documents1.worldbank.org/curated/en/574801510949557053/pdf/933530WP0Women0s0Box385379B00OU0090.pdf>
- Krylov, S. (2018). Target financial forecasting as an instrument to improve company financial health. *Cogent Business & Management*, 5(1), 1540074. <https://doi.org/10.1080/23311975.2018.1540074>
- Ministry of Environment and Forestry of the Republic of Indonesia. (2022). Enhanced Nationally Determined Contribution (ENDC): Republic of Indonesia. <https://unfccc.int/documents/624577>
- Otoritas Jasa Keuangan. (2024). Climate risk management and scenario analysis (CRMS) – Buku 1. OJK. <https://www.ojk.go.id>
- Otoritas Jasa Keuangan. (2025, February). Indonesia taxonomy for sustainable finance: Version 2 (2025). OJK Institute for Sustainable Finance. <https://www.ojk.go.id>
- Permata Institute for Economic Research (PIER). (2025, May 21). *PIER snapshot: May-25 BI-Rate*. PT Bank Permata Tbk. <https://www.Permata Bank.com>
- Permata Institute for Economic Research. (2025, May). *PIER snapshot: May-25 BI Rate* [Economic bulletin]. PT Bank Permata Tbk. <https://www.Permata Bank.com/sites/default/files/PIER%20Snapshot%20May-25%20BI%20Rate.pdf>
- Pfeffer, J., & Salancik, G. R. (1978). *The external control of organizations: A resource dependence perspective*. New York: Harper & Row
- Pike, R., & Neale, B. (2009). *Corporate finance and investment: Decisions and strategies* (5th ed.). Pearson Education Limited.
- PT ABM Investama Tbk. (2024). Annual report 2024.
- PT ABM Investama Tbk. (2025, March). Company presentation: Q1 2025 performance.
- PT Adaro Andalan Indonesia Tbk. (2024). Annual report 2024: Operational excellence for national energy security.
- PT Adaro Andalan Indonesia Tbk. (2025, March 4). FY24 earnings news release.
- PT Bank Central Asia Tbk. (2024). Annual report 2024: Propelled by trust.
- PT Bank Central Asia Tbk. (2024). Sustainability report 2024: Unity for responsibility.
- PT Bank Mandiri (Persero) Tbk. (2024). Annual report 2024: Leading today, championing the future.
- PT Bank Mandiri (Persero) Tbk. (2024). Sustainability report 2024: Leading with impact – Becoming Indonesia's sustainability champion.

- PT Bank Negara Indonesia (Persero) Tbk. (2024). Annual report 2024: Transforming the future, empowering Indonesia.
- PT Bank Negara Indonesia (Persero) Tbk. (2024). Sustainability report 2024: Strong bonds, great impact.
- PT Bank Permata Tbk. (2025). Annual report 2024. Author.
- PT Bank Permata Tbk. (2025, March). Sustainability report 2024: Nurturing resources for sustainability.
- PT Bank Rakyat Indonesia (Persero) Tbk. (2024). Annual report 2024: Continuing the transformation, becoming more brilliant and excellent.
- PT Bank Rakyat Indonesia (Persero) Tbk. (2024). Sustainability report 2024: Brilliant steps toward sustainable finance.
- PT Bayan Resources Tbk. (2024). Annual report 2024.
- PT Bayan Resources Tbk. (2025). 2025 guidance.
- PT Indo Tambangraya Megah Tbk. (2024). Annual report 2024: Powering our transformation, reinforcing the core.
- PT Indo Tambangraya Megah Tbk. (2025, May 16). 1Q25 performance result: Analysts meeting.
- Seawright, J., & Gerring, J. (2008). Case selection techniques in case study research: A menu of qualitative and quantitative options. *Political Research Quarterly*, 61(2), 294–308.
<https://doi.org/10.1177/1065912907313077>
- Setiawan, R., Putri, O. R., & Sukmawati, A. C. (2023). Diversifikasi portofolio kredit, risiko dan return bank [Credit portfolio diversification, risk and bank return]. *Jurnal Akuntansi*, 15(1), 189–199.
- Schoenmaker, D., & Schramade, W. (2019). *Principles of sustainable finance*. Oxford University Press.
- Spence, M. (1973). Job Market Signaling. *The Quarterly Journal of Economics*, 87(3), 355–374.
<https://doi.org/10.2307/1882010>
- Vernimmen, P., Quiry, P., Dallochio, M., Le Fur, Y., & Salvi, A. (2014). *Corporate Finance: Theory and Practice* (4th ed.). Wiley.
- Warrier, P. (2024). Sustainable banking assessment 2024. WWF-Singapore. <https://www.wwf.sg/>
- World Bank. (2025, April). Commodity market outlook: April 2025.
<https://www.worldbank.org/en/research/commodity-markets>
- Yin, R. K. (2018). *Case study research and applications: Design and methods* (6th ed.). SAGE Publications.