Net Present Value (NPV) Vs. Internal Rate of Return (IRR): Evaluating Investment Rules in Financial Markets

Senlong Wang *

Department of Accounting, Durham University, Durham DH1 3LE, United Kingdom

* Corresponding Author Email: 2326669795@qq.com

Abstract. Investment decisions are crucial for maximizing financial outcomes and allocating capital effectively in financial markets. Net Present Value (NPV) and Internal Rate of Return (IRR) are two widely used methods in investment appraisal. This paper explores the distinctions between these two methods, focusing on their theoretical underpinnings, practical applications, and limitations in real-world scenarios. Through a series of hypothetical case studies, the paper demonstrates how NPV and IRR perform under different investment conditions, including varying cash flow structures and project sizes. The findings highlight that while IRR provides a percentage return which is easy to interpret, it suffers from limitations such as multiple IRR solutions in projects with non-conventional cash flows. In contrast, NPV offers a more reliable and consistent measure of project value, aligning with the principle of shareholder wealth maximization. The study concludes that NPV is the preferred method for investment evaluation, particularly in projects with complex or irregular cash flows. While IRR remains useful in simpler scenarios, its shortcomings emphasize the need for a more comprehensive approach to capital budgeting decisions.

Keywords: Net Present Value, Internal Rate of Return, Investment Appraisal, Financial Decision-Making.

1. Introduction

Imagine having to make investment decisions when one project yields a higher percentage return but only modest benefits. The other offers a higher profit but a lower profit at the same time. Analysts use tools like Net Present Value (NPV) and Internal Rate of Return (IRR) to solve this problem because it is crucial to capital budgeting. Capital allocation is determined by investment decisions, which have an impact on conservation, progress, and success. Making a credible review a necessity when choosing the wrong task results in wasted resources, economic losses, or missed opportunities.

In financial institutions and commercial banking, NPV and IRR are frequently used to calculate purchase charm and support tactical decisions. Banks, investment companies, and companies use these methods to estimate capital expenditures, mergers, system projects, and financial planning. Their program organizes purchase comparisons, providing the best possible use of funds and shareholder results. These measures are important financial tools because they are used by regulators and analysts to assess project feasibility and economic wellbeing.

Despite their acceptance, these methods generally produce conflicting outcomes, leaving choice-makers unsure which expense maximizes benefit. Because they offer unique viewpoints, NPV and IRR are compared. Ppf focuses on overall value creation and coincides with shareholder wealth maximization, while IRR provides a percentage return measurement that is easier to interpret but has limits. Analyzing these methods helps know their strengths, weaknesses, and best programs, allowing investors to make informed choices.

The success of NPV and IRR depends on the program environment despite their significant influence on financial decision-making. Their benefits and drawbacks have been examined in several research. Zhang (2022) clarified that IRR is a useful tool for determining long-term investments by contrasting project returns to a benchmark rate. It provides a simple and practical construction for choosing various financial market projects. In contrast, NPV more closely ties the total value of a site to shareholder wealth maximization.In contrast to other investment evaluation metrics, NPV is still the most reliable and consistent indicator of financial stability, according to Sokolov (2024). In

comparison, IRR and various methods usually yield confusing outcomes. Hartman and Schafrick (2004) determined that NPV is a more straightforward and trustworthy metric for investment evaluation after analyzing IRR's limitations, particularly the presence of multiple IRRs.

In order to compare the effectiveness of NPV and IRR in capital budgeting, this post examines their advantages, drawbacks, and software. By examining computing systems, beliefs, and decision-making relevance, this investigation clarifies when and how each should be used. Additionally, it looks at alternative investment appraisal methods that address IRR restrictions and complement NPV in economic decisions.

The NPV and IRR's guidelines are explored in this article, along with their beliefs and foundations. In terms of job size, shareholder value, and funding assumptions, it evaluates why NPV is the better choice rule. The review summarizes important findings and recommends a multi-method method for better financial choices.

2. Literature Review

Investment appraisal provides fundamental frameworks for determining project viability using Net Present Value (NPV) and Internal Rate of Return (IRR) in financial decision-making. Knowing their conceptual foundations, presumptions, opportunities, and limitations is necessary to make wise investment decisions.

2.1. Key Assumptions of NPV and IRR

NPV and IRR are built upon key assumptions, determining their relevance in different situations. Hazen (2003) examines the IRR method's reinvestment assumption, pointing out that the IRR method's reinvestment assumption is overly idealistic, leading to inflated return expectations, particularly in high-return projects. The realism of NPV's reinvestment assumption, which uses the company's Weighted Average Cost of Capital (WACC), is further supported by Hartman and Schafrick (2004). They contend that this idea is ideal for current financial issues, properly reflecting a site's true monetary value and avoiding making too much of an investment decision.

2.2. NPV and IRR comparison requirements

The authenticity of funding assumptions, project-level considerations, decision clarity, alignment with shareholder value, and sensible usability are important factors to consider when comparing NPV and IRR. Magni and Marchioni (2018) discovered that the NPV discount rate assumption results in more stable decision outcomes through sensitivity analysis. NPV conducts regular evaluations, especially for jobs that involve non-standard cash flows. Despite their intuitiveness, Militaru (2020) points out that percentage-based IRR results may be beneficial for smaller projects with higher returns but lower overall value. NPV, in contrast, encourages investment to rise and accurately depicts total value creation. Ultimately, the examination emphasizes the importance of identifying the best course of action for the work environment.

2.3. Benefits of NPV and IRR

If WACC revenue correlates more strongly with company practices, NPV has the advantage of being able to accurately indicate a site's real price. Based on a thorough analysis of CFOs, Graham and Harvey (2001) claim that NPV is one of the most theoretically sound and practically preferred valuation techniques. According to their research, managers favour NPV mainly because it reflects the additional value created for shareholders, contributes to the broader objective of enhancing overall firm value, and offers a consistent standard for evaluating projects of varying sizes and durations. Sokolov (2024) states that IRR's percentage-based return expression is influenced by simplicity and ease of use. IRR provides a management-oriented effective ranking factor to help decision-makers quickly analyze work performance in resource-constrained situations.

2.4. NPV and IRR problems

While NPV does accurately reflect real value, its results are heavily affected by low discount rates, and selecting the right rate often involves dealing with uncertainty. Moreover, for non-financial stakeholders, NPV's purely monetary figures can feel less intuitive.In response to irregular cash flows, Hartman and Schafrick (2004) point out that IRR has significant limitations, including the possibility of yielding multiple or even no valid solutions, which can further complicate decision-making. Wang (2021) observes that projects featuring delayed investments, frequent shifts in cash flow signs, or mutually exclusive alternatives often challenge the reliability of IRR, which can result in either multiple conflicting solutions or the absence of a valid rate, ultimately increasing the risk of suboptimal investment decisions.

3. Methodology

3.1. Research Approach

This study adopts a structured case-based framework to compare the effectiveness of Net Present Value (NPV) and Internal Rate of Return (IRR) across diverse investment scenarios. A set of hypothetical projects was developed to reflect various financial conditions commonly encountered in capital budgeting, including differences in cash flow regularity, direction, timing, project duration, and investment scale.

By employing simulated data, the study ensures internal consistency and allows for a focused comparison of how each method performs under controlled conditions. The abstraction from real-world data eliminates confounding variables, enabling a clearer view of the theoretical strengths and weaknesses of each metric.

3.2. Financial Computation and Formulas

Two fundamental financial evaluation methods commonly used to assess project viability are Net Present Value (NPV) and Internal Rate of Return (IRR). The NPV is calculated using the following formula:

$$NPV = \sum_{t=0}^{n} \frac{C_t}{(1+r)^t}$$

where C_t represents the net cash flow at time t, and r is the discount rate.

The IRR is defined as the discount rate r that makes the NPV of a project equal to zero, as shown in the formula:

$$0 = \sum_{t=0}^{n} \frac{C_t}{(1+IRR)^t}$$

The Internal Rate of Return (IRR) for each project was calculated using standard financial algorithms. To assess the sensitivity of NPV, projects were analysed using discount rates of 5%, 10%, and 20% (where applicable). These varying rates also served as robustness checks for each scenario.

3.3. Case Construction and Data

Four categories of investment projects were constructed to represent a range of real-world budgeting scenarios:

3.3.1 Conventional Independent Project (Project A)

Project A involves an initial investment followed by fixed positive cash inflows over three years. It is used to assess whether the Internal Rate of Return (IRR) and Net Present Value (NPV) produce consistent evaluations under simple conditions, serving as a benchmark for comparison.

3.3.2 Lending and Borrowing Structures (Projects B and C)

Projects B and C are structurally identical in terms of cash flow magnitude but differ in the direction of cash flows. Project B involves an initial investment followed by a positive cash inflow, while Project C has an initial cash inflow followed by a negative cash flow. These projects are designed to test the consistency of the Internal Rate of Return (IRR) and examine the directional sensitivity of the Net Present Value (NPV).

3.3.3 Non-Conventional Cash Flow Project (Project D)

Project D involves alternating positive and negative cash flows. It is designed to test the effectiveness and reliability of the Internal Rate of Return (IRR) in projects with non-conventional cash flow patterns.

3.3.4 Mutually Exclusive Projects (Projects E–J)

Projects E through J represent conventional investment projects, where a firm must select one project from each of the following groups based on alternative investment options. The projects differ in terms of cash inflows, investment scale, and lifespan. Specifically:

Group 1: Project E and Project F

Both projects have the same initial investment and lifespan, but they differ in the magnitude of the expected cash inflows. Project E generates higher cash inflows in the early years, while Project F's inflows are lower. The firm must select one project from this group based on cash flow preferences.

Group 2: Project G and Project H

These projects differ in investment scale, with Project G requiring a smaller initial investment than Project H. However, both projects have similar cash inflows over their respective lifespans. A firm must select one project from this group, considering the scale of investment and return potential.

Group 3: Project I and Project J

Project I and Project J differ in their lifespan, with Project I having a shorter duration compared to Project J. Despite this, both projects generate similar cash inflows during their respective lifespans. The firm must choose one project from this group based on the desired project duration and cash flow characteristics.

To assess the viability of mutually exclusive projects, incremental cash flow analysis was applied. This method compares the additional benefits of one project over another, particularly useful in evaluating NPV and IRR for projects with differing cash flow structures. By considering the differences in cash flows, this analysis helps identify the most favorable investment choice, providing insights into the decision-making process when comparing NPV and IRR.

All projects are hypothetical and adhere to clearly defined cash flow schedules. The Net Present Value (NPV) and Internal Rate of Return (IRR) for each project were computed using the methodologies outlined above. Table 1 provides a summary of the key input-output data for each project.

Table 1. Comparison Table of Cash Flow Structure, Incremental Analysis and Evaluation of Investment Projects

Project	Cash flows				
	CF0	CF1	CF2	CF3	CF4
A	-100	40	40	40	
B	-100	130			
C	100	-130			
D	1000	-5000	4500		
E	-1100	650	950	550	
F	-1100	650	750	350	
E-F	0	0	200	200	
G	-1000	600	700	300	
H	-1200	500	950	400	
G-H	200	100	-250	-100	
I	-100	70	50	20	
J	-100	10	20	40	120

3.4. Limitations of the Methodology and Data

Although using theoretical projects guarantees inside consistency and allows different comparisons between NPV and IRR, some methodological limitations may be acknowledged. The cash flows analyzed in this study are simplified and fixed, without accounting for real-world factors like inflation, taxes, regulatory shifts, or unexpected economic events. Pástor and Veronesi (2013) state that political uncertainty can influence investment decisions by altering anticipated cash flows and discount rates. Valuation methods like NPV and IRR can result in biased effects because they are based on assumptions of stable cash flows and steady discount rates, these methods may not hold up when political risks come into play. Moreover, the analysis leaves out probabilistic risk modeling techniques—like scenario planning, sensitivity analysis, or Monte Carlo simulations—which limits the understanding of how these valuation approaches behave in uncertain environments. Moreover, the jobs don't coincide with any specific industry, which could affect the findings ' functional software to sector-specific economic conditions.

In light of these limitations, the findings should be viewed as suggestive rather than definitive. Future studies should include real-world data, use risk-adjusted valuation techniques, and develop industry-specific project models to complement this prepared scientific approach.

4. Findings and Discussion

In the fourteen simulated investment projects, key theoretical insights were made about using Net Present Value (NPV) and Internal Rate of Return (IRR). Each task team offers several choice-making challenges, and this section integrates those findings with the literature reviewed earlier, highlighting the strengths and limitations of each evaluation technique when applied under varying financial conditions.

Table 2. Comparison and Multivariate Analysis of NPV and IRR Evaluation of Investment Projects under Multiple Discount Rates

Project	NPV			IRR
	NPV (5%)	NPV (10%)	NPV (20%)	IRR
A	-	-0.53	-	9.7%
B	23.81	18.18	8.33	30%
C	-23.81	-18.18	-8.33	30%
D	319	173.55	-41.67	17.71%/282.29%
E	-	689.38	-	39.12%
F	-	373.76	-	23.75%
E-F	-	315.62	-	-
G	-	349.38	-	22.83%
H	-	340.23	-	20.79%
G-H	-	9.16	-	10.58%
I	-	19.98	-	23.56%
J	-	37.63	-	21.18%

4.1. Conventional Investment Structures

Project A serves as a classic example of a conventional independent investment, involving a £100 initial outlay followed by three consistent annual inflows of £40. Under a 10% discount rate, the project exhibits a negative NPV of -£0.53 and an IRR of 9.7%, leading to a rejection decision by both methods. This consistency between NPV and IRR aligns with the theoretical expectations when cash flows are stable and simple. According to Hartman and Schafrick (2004), the realism of NPV stems from its assumption that reinvestments occur at the firm's cost of capital (WACC), better reflecting the true economic value of projects compared to the idealistic reinvestment assumptions embedded within IRR. Moreover, the close proximity between IRR and the discount rate in this case highlights the importance of sensitivity analysis, as minor changes in market conditions could alter the investment decision.

4.2. Directionality and Sensitivity

Projects B and C demonstrate the sensitivity of investment decision-making to cash flow directionality, even when IRRs appear identical at 30%. Project B (lending structure) consistently delivers positive NPVs, while Project C (borrowing structure) results in negative NPVs across all discount rates analyzed. This contradiction underscores Hazen's (2003) criticism that IRR inherently assumes symmetrical cash flows, thereby failing to distinguish between value-creating and value-eroding projects. In contrast, NPV, by capturing the absolute value of cash flows, appropriately reflects project viability. As Sokolov (2024) emphasizes, NPV offers a more consistent and reliable indicator of financial stability, aligning directly with shareholder wealth maximization.

4.3. Complex Cash Flow Patterns

Project D features a non-conventional cash flow pattern characterized by multiple sign changes: an initial inflow of £1,000, a major outflow of £5,000, followed by a substantial inflow of £4,500. Figure 1 illustrates the relationship between NPV and the discount rate for Project D, highlighting the project's two IRR points and the behaviour of the NPV curve. At a 10% discount rate, Project D exhibits a positive NPV of £173.55, indicating profitability. However, the NPV curve reveals two IRR points — one at a lower discount rate and another at a much higher rate (approximately 17.62% and 282.13%).

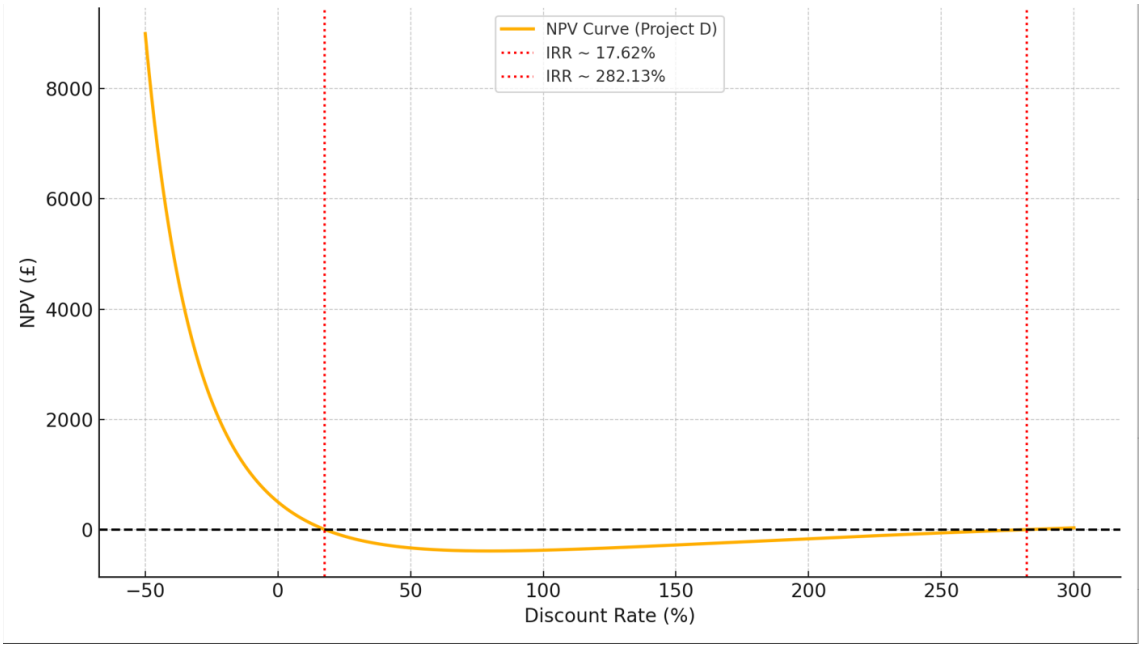

Fig. 1 NPV vs Discount Rate for Project D

Between these two IRR points, the NPV curve lies below the x-axis, indicating a negative NPV within this range. This suggests that, at discount rates between the two IRRs, the project is not financially viable and would erode value. The curve crossing the x-axis at two distinct points signals multiple IRRs, which can create ambiguity and make it difficult to make clear investment decisions based solely on IRR.

In contrast, the NPV method offers a clearer evaluation. The positive NPV at a 10% discount rate confirms the project's profitability. Unlike IRR, which fails to provide a decisive conclusion in this case, NPV offers a consistent and reliable signal of financial viability. This highlights one of the key advantages of using NPV over IRR, particularly in cases where multiple IRR points or negative NPVs complicate decision-making.

This supports Hartman and Schafrick (2004), who claim that NPV can still be used to evaluate projects with complex or fluctuating cash flows. It provides trustworthy cost advice when IRR becomes complicated or ambiguous. NPV should be used as the preferred evaluation method in instances like Project D.

4.4. Ranking Under Capital Constraints

The comparison between Projects E and F highlights a clear preference for Project E, based on both higher NPV (£689.38 vs. £373.76 at a 10% discount rate) and IRR (39.12% vs. 23.75%). These results demonstrate that, at the given discount rates, Project E offers more value and a higher return, making it the more attractive investment option.

Incremental analysis further supports this preference. Figure 2 illustrates the incremental NPV curve for Project E compared to Project F. The curve shows a consistently positive incremental NPV across all discount rates analysed, indicating that Project E is superior to Project F at every rate. This positive incremental NPV implies that the additional cash flows generated by Project E, compared to Project F, consistently contribute more value, reinforcing the use of NPV as a reliable tool for ranking projects.

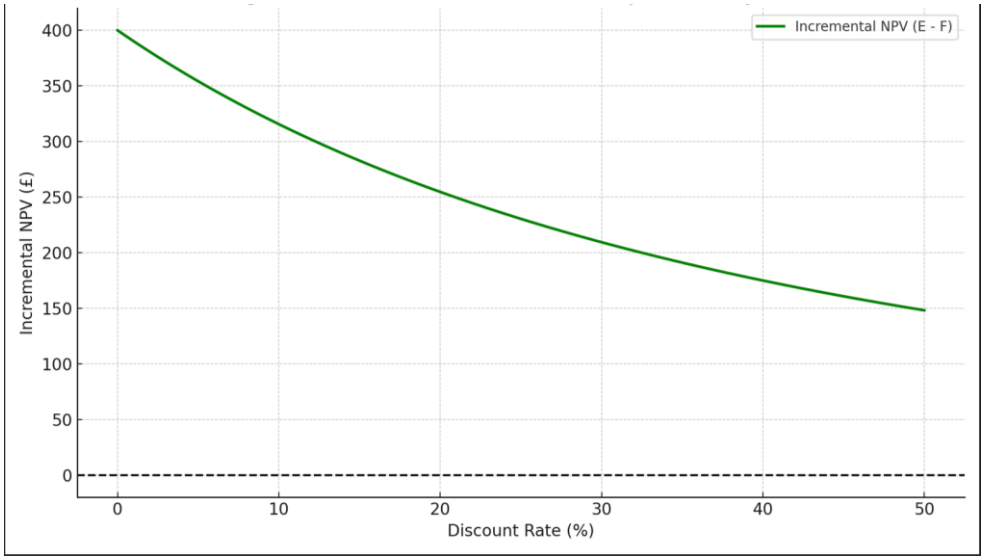

Fig. 2 Incremental NPV Curve (Project E - Project F)

In the case of Projects G and H, although the difference in NPV (£349.38 vs. £340.23 at a 10% discount rate) and IRR (22.83% vs. 20.79%) is marginal, incremental analysis favours Project G. Figure 3 illustrates the incremental NPV curve for Project G compared to Project H. The curve intersects the x-axis at a discount rate of 10.58%, indicating that for discount rates below this point, Project H is the preferred choice, while for discount rates above this point, Project G becomes more favourable.

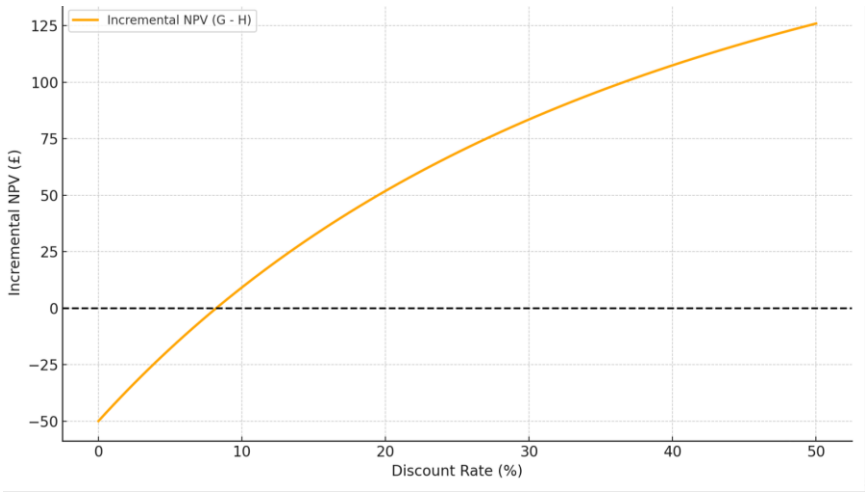

Fig. 3 Incremental NPV Curve (Project G - Project H)

The use of NPV, and particularly incremental NPV, provides a more precise evaluation of the marginal benefits between the projects. This method highlights the scale differences that IRR alone may not fully capture. Despite the small difference in NPV and IRR, the incremental analysis offers a clearer picture, showing that Project G becomes more attractive at higher discount rates.

For Projects I and J, a conflict arises between the two evaluation methods: Project I have a higher IRR (23.56% vs. 21.18%), while Project J has a higher NPV (£37.63 vs. £19.98). When using IRR, Project I would be preferred due to its higher rate of return. However, when using NPV, Project J is favoured because it provides a greater monetary value (£37.63 vs. £19.98). This discrepancy highlights one of the key advantages of NPV: it emphasizes the total value generated by the project, rather than the relative percentage return provided by IRR.

Magni and Marchioni (2018) emphasize that NPV should be prioritized when ranking mutually exclusive projects, as it more accurately reflects absolute value creation, aligning directly to maximize shareholder wealth. Therefore, the more reliable choice based on NPV was Project J because it generates more value in absolute terms, despite Project I's higher IRR.

4.5. Synthesis of Empirical and Theoretical Insights

NPV consistently produced clearer, more understandable, and possibly outcomes that align with theoretical expectations across all categories. It performed well across conventional, asymmetrical, and complex financial structures, whereas IRR remained reliable only in straightforward, regular cases. The study confirms Hazen's (2003) criticism of the IRR's reinvestment assumption and Hartman and Schafrick's (2004) warning about multiple IRR solutions. Additionally, the findings support Magni and Marchioni's (2018) recommendation to favour NPV-consistent methods, particularly in ranking and comparative analysis. Value maximization and strategic decision-making are directly related to NPV, according to Sokolov (2024). The data firmly supports the claim that although IRR can still serve as a helpful tool for communication, NPV ought to be the foundation of a solid capital budgeting strategy.

5. Conclusion

5.1. Final Assessment

Through a comprehensive evaluation of multiple simulated investment scenarios, this study has systematically highlighted the core differences between Net Present Value (NPV) and Internal Rate of Return (IRR) from theoretical and practical perspectives. While IRR produced regular signals under simple, straight cash flow conditions (as demonstrated in Project A), it exhibited considerable inconsistencies when applied to projects involving reversed cash flow directionality, different sign changes, or mutually special comparisons, quite as Projects B, C, and D. In contrast, NPV maintained interior consistency, decision clarity, and economic interpretability across all project types. Its ability to account for project scale, timing of cash flows, and shareholder value placing made it particularly reliable. These findings are strongly aligned with Hartman and Schafrick (2004) regarding complex cash flows, Hazen (2003) on reinvestment assumptions, and Magni and Marchioni (2018) on the superior stability of NPV in ranking decisions. However, this research confirms that NPS offers a more effective and sound investment assessment framework than IRR, particularly in complex or non-standard project environments.

5.2. Broader Implications

In practice, the results highlight the importance for corporate finance professionals, investment analysts, and decision-makers to be cautious when relying on IRR as their main basis for decisions.Although IRR is still direct and simple for major assessments, suboptimal purchase priority, specifically under funds rationing scenarios, may result from its scientific flaws, such as multiple IRRs, deceptive signals under reversed cash flows, and degree insensitivity. This study confirms that NPV should be used as the main input when making capital budgeting decisions in addition to liberal cash flow analysis to create job positions and marginal benefit evaluation. An approach is essential for industries characterized by prolonged-term, higher-risk, and unnatural cash flow patterns, such as infrastructure, energy, and technology. Pawel (2014) introduced a framework based on net present value (NPV) principles to calculate the levelized cost of stored energy (LCOE), facilitating more systematic financial assessment and technology comparison in renewable energy projects. His research demonstrates that precise LCOE modelling is necessary to make sound investment decisions in industries with volatile and long-term money flows. Additionally, in line with Sokolov's (2024) recommendations,finance education and corporate training programs should focus on emphasizing NPV-based decision-making frameworks, with IRR introduced as a secondary tool rather than a primary evaluation metric.

5.3. Suggestions for Further Research

While this study primarily focuses on NPV and IRR, alternative investment appraisal methods, such as the Modified Internal Rate of Return (MIRR) and Profitability Index (PI), can address some

of IRR's limitations. These approaches are designed to improve the accuracy of investment evaluations, especially in situations involving irregular cash flows or the presence of multiple IRRs. Qi, Wang, and Xu (2022) point out that MIRR is more appropriate for projects with non-standard cash flow patterns in order to improve the unrealistic reinvestment assumptions of IRR. Similarly, Sokolov (2024) discusses the PI as a useful tool for determining project viability, especially with limited resources. While these alternatives are outside the scope of this paper, future research could examine their effectiveness and potential integration with NPV for improved capital budgeting.

A promising area for further exploration is the behavioural finance factors influencing the selection of investment appraisal tools. Despite its theoretical limitations, IRR remains widely used in practice. Understanding why IRR is still preferred over NPV, despite its drawbacks, could offer valuable insights. Cognitive biases, organizational inertia, the simplicity of risk communication, and regulatory pressures might all contribute to the continued use of IRR by finance professionals. Future qualitative or experimental studies could investigate these factors to explain why IRR persists as a dominant tool, even with its theoretical shortcomings, and offer recommendations for more effective decision-making.

References

[1] Graham, J.R. and Harvey, C.R. (2001) 'The theory and practice of corporate finance: evidence from the field', Journal of financial economics, 60(2), pp. 187–243.Available at: https://doi.org/10.1016/S0304-405X(01)00044-7.

[2] Hartman, J. C., & Schafrick, I. C. (2004). 'The relevant internal rate of return'. The Engineering Economist, 49(2), pp.139-158.Available at: https://doi.org/10.1080/00137910490453419

[3] Hazen, G. B. (2003). 'A new perspective on multiple internal rates of return'. The Engineering Economist, 48(1), 31-51. Available at: https://doi.org/10.1080/00137910490453419

[4] Magni, C. A., & Marchioni, A. (2018). 'Average rates of return, working capital, and NPV-consistency in project appraisal: A sensitivity analysis approach'. International Journal of Production Economics, 200, 200-210.Available at: https://doi.org/10.1016/j.ijpe.2018.03.015

[5] Militaru, I. (2020). 'Net Present Value (Npv) Versus Internal Rate of Return (Irr) In Taking the Investment Decision for Mutually Exclusive Projects'. "Victor Slăvescu" Centre for Financial and Monetary Research, 125.Available at: https://icfm.ro/RePEc/vls/vls_pdf_jfme/vol8i1p125-128.pdf

[6] Pástor, Ľ., & Veronesi, P. (2013). 'Political uncertainty and risk premia'. Journal of financial Economics, 110(3), pp.520-545.Available at: https://doi.org/10.1016/j.jfineco.2013.08.007

[7] Pawel, I. (2014). 'The cost of storage–how to calculate the levelized cost of stored energy (LCOE) and applications to renewable energy generation'. Energy Procedia, 46, pp.68-77. Available at: https://doi.org/10.1016/j.egypro.2014.01.159

[8] Qi, J., Wang, Y., & Xu, Y. (2022). 'Research on Project Investment: Methods of NPV, IRR and MIRR'. In 2022 International Conference on mathematical statistics and economic analysis (MSEA 2022). pp. 710-715. Atlantis Press.Available at: 10.2991/978-94-6463-042-8_102

[9] Sokolov, M. V. (2024). 'NPV, IRR, PI, PP, and DPP: A unified view'. Journal of Mathematical Economics, 114, 102992.Available at: https://doi.org/10.1016/j.jmateco.2024.102992

[10] Subedi, M., & Farazmand, A. (2020). 'Economic value added (EVA) for performance evaluation of public organizations. Public Organization Review, 20, 613-630.Available at: https://doi.org/10.1007/s11115-020-00493-2

[11] Wang, Z. (2021) 'Evaluating the accuracy of net present value and initial rate of return investment rules', Proceedings of the 3rd International Conference on Economic Management and Cultural Industry (ICEMCI 2021), Atlantis Press, pp. 1319–1322.Available at: https://doi.org/10.2991/assehr.k.211209.215

[12] Zhang, Y. (2022) 'The Effectiveness of NPV and IRR Used in Fundamental Financial Markets', Proceedings of the 7th International Conference on Financial Innovation and Economic Development (ICFIED 2022), Atlantis Press, pp. 1208–1212.Available at: 10.2991/aebmr.k.220307.200