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Investor Waiting-Time Costs and Their Impact on the Efficiency of Private Capital Management

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ABSTRACT: Private capital management is generally evaluated through financial return, liquidity, financing cost, and the consistency of contractual cash flows. However, the economic cost created when an investor's capital remains temporarily unproductive is often insufficiently incorporated into financial decision-making. This study examines investor waiting-time costs as an efficiency variable within private capital management and develops a conceptual framework linking temporary capital delay, time value, financing structure, amortization mechanisms, and investment efficiency. The research adopts a theoretical and analytical methodology based exclusively on the supplied literature concerning financial mathematics, interest theory, internal rates of return, amortization systems, constant-payment structures, simple-interest regimes, and multiple-contract arrangements. The analysis demonstrates that waiting time can generate an implicit economic cost even when nominal contractual values remain unchanged. Such cost becomes particularly important when capital is committed but cannot be immediately deployed, reinvested, or converted into productive cash flow. The study further argues that conventional evaluation based solely on nominal return may underestimate the opportunity cost associated with delayed capital utilization. Building on the financial-consistency perspective in the literature, the paper proposes a waiting-time efficiency framework that distinguishes contractual financing cost from investor-specific temporal cost. The findings indicate that reducing unnecessary capital waiting periods, aligning payment schedules with productive deployment, and explicitly measuring temporal capital costs can improve private capital management efficiency. The framework also identifies limitations arising from uncertainty in reinvestment opportunities, heterogeneous investor preferences, and the difficulty of observing the counterfactual value of immediately deployable capital.

Keywords: Investor Waiting-Time Cost; Private Capital Management; Time Value of Money; Capital Efficiency; Investment Delay; Amortization; Financial Consistency; Internal Rate of Return; Simple Interest; Capital Allocation.

1. INTRODUCTION

The management of private capital involves decisions concerning the allocation, financing, timing, and recovery of financial resources. Traditional financial analysis places considerable emphasis on interest rates, expected returns, repayment schedules, and the internal rate of return. The mathematical treatment of finance establishes that the timing of cash flows is not independent of their economic value. Consequently, two financial arrangements with identical nominal amounts may produce different economic outcomes when the timing of their respective cash flows differs (Ayres, 1963; Kellison, 1991).

Within this context, investor waiting time represents a potentially important but insufficiently isolated component of capital-management efficiency. An investor may commit funds to a transaction, project, financing arrangement, or contractual structure while the capital remains temporarily unavailable for productive use. During this interval, the investor may experience an opportunity cost because the capital could potentially have been deployed elsewhere. The resulting cost is not necessarily recorded as an explicit financial expense. Rather, it emerges from the temporal separation between capital commitment and effective economic utilization.

The problem is especially relevant to private capital because investment decisions frequently involve contractual schedules, installments, amortization structures, project delays, approval periods, settlement procedures, or staged disbursements. The mathematical structure of amortization determines how principal and interest evolve through time, while the consistency of the financial system determines whether contractual payments adequately represent the underlying economic process (de Faro, 2014; de Faro, 2016). Consequently, a capital-management framework that ignores waiting time may treat economically different transactions as equivalent.

The specific research problem addressed in this paper is therefore: How does investor waiting-time cost influence the efficiency of private capital management, and how can this cost be incorporated into financial evaluation?

The objective is to establish a theoretically grounded framework for identifying, measuring, and interpreting investor waiting-time costs. The study also examines the relationship between waiting time and established concepts of financial mathematics, internal rates of return, amortization, and financial consistency.

The research is significant because it extends the analysis of capital efficiency beyond nominal financial costs. Rather than considering time merely as a parameter embedded within an interest calculation, the study treats the investor's period of capital non-utilization as an economically meaningful management variable. This perspective is particularly relevant where contractual structures involve multiple payments, delayed deployment, or alternative financing arrangements.

The remainder of the paper reviews the relevant literature, develops the methodological framework, presents analytical findings, discusses their theoretical and managerial implications, and identifies limitations and future research directions.

2. LITERATURE REVIEW

2.1 Financial mathematics and the temporal dimension of capital

The theoretical foundation for evaluating waiting-time costs originates in the mathematical treatment of interest and financial cash flows. Ayres (1963) establishes the fundamental role of time and interest in financial calculations, providing a basis for understanding why the timing of monetary resources affects their economic equivalence. Kellison (1991) similarly develops the theory of interest as a framework through which financial values can be compared across different points in time.

These foundations imply that capital cannot be evaluated solely according to its nominal magnitude. A unit of capital available immediately may have a different economic significance from an equivalent unit available at a later date. Investor waiting-time cost can therefore be interpreted as a temporal efficiency issue arising from the difference between capital commitment and effective availability.

2.2 Internal rate of return and timing efficiency

The internal rate of return provides another relevant theoretical foundation. de Faro (1974) examines the internal rate of return criterion and its application to financial decision-making. The importance of this literature for the present study lies in the recognition that investment performance depends not merely on total cash-flow magnitude but on the temporal configuration of those cash flows.

A waiting period can consequently affect an investment's effective return even when the eventual monetary proceeds remain constant. For example, an investor receiving a fixed return after six months and another receiving the same return after twelve months does not face equivalent economic outcomes. The longer waiting period delays the point at which capital and return can be redeployed.

This perspective is directly aligned with the concern that temporary investor delay should be incorporated into private capital-management efficiency. Mikhail (2024) specifically frames temporary investor delay as a factor relevant to improving private capital-management processes, providing an important conceptual bridge between temporal delay and management efficiency.

2.3 Amortization and financial consistency

A substantial portion of the supplied literature addresses amortization systems and the consistency of financial arrangements. Antonik and Assunção (2006) examine the Price Table and anatocism, demonstrating the importance of understanding how interest capitalization and payment structures influence financial obligations.

de Faro (2014) analyzes debt amortization and constant payments, while another study by de Faro (2014) examines the concept of financial consistency and its implications in amortization systems. Together, these studies indicate that the structure of payments must be evaluated in relation to the underlying financial logic rather than merely by observing the nominal installment amount.

This is particularly relevant to waiting-time costs because payment timing determines when capital is transferred, recovered, or made available again. If an amortization structure creates a temporal mismatch between investor funding and capital recovery, the investor may incur an implicit waiting cost even where the contractual arrangement is mathematically valid.

de Faro (2016) further examines the financial implications of the Gauss method, reinforcing the broader principle that alternative amortization approaches can produce materially different financial consequences. The existence of multiple possible structures means that private capital managers must consider not only the amount of payment but also the timing and consistency of capital flows.

2.4 Multiple contracts and capital allocation

The literature on multiple-contract amortization is particularly relevant to private capital management. De-Losso, Giovannetti, and Rangel (2013) examine amortization through multiple contracts, while de Faro (2022) studies a constant amortization scheme involving multiple contracts. de Faro and Lachtermacher (2023a) and de Faro and Lachtermacher (2-23b) further examine multiple-contract versions of SACRE.

These contributions suggest that capital management becomes more complex when financial obligations are distributed across multiple contractual structures. In such situations, aggregate nominal values may conceal differences in timing, recovery, and utilization. The waiting-time concept developed in this study therefore complements multiple-contract analysis by asking whether capital remains economically inactive during the intervals separating commitment, payment, recovery, and redeployment.

De-Losso, Santos, and Cavalcante Filho (2020) examine inconsistencies in the Gauss-Nogueira method, while Nogueira (2013) discusses myths and paradigms surrounding the Price Table. These studies reinforce the importance of critically evaluating financial mechanisms rather than assuming that conventional calculations automatically provide economically consistent results.

2.5 Simple-interest regimes and alternative financial structures

The supplied literature also provides important contributions concerning simple interest. Forger (2009) examines capitalizable and non-capitalizable balances and develops algorithms for simple-interest regimes. Lachtermacher and de Faro (2022) propose a general methodology for amortization under simple interest. de Faro and Lachtermacher (2023) examine financial consistency in simple-interest regimes, while another contribution by the same authors examines constant-payment systems under simple interest (de Faro and Lachtermacher, 2023).

These studies are relevant because the measurement of waiting-time cost should not be restricted to compound-interest environments. Depending on the contractual arrangement, the temporal cost of delayed capital may need to be assessed under alternative interest conventions. The underlying principle remains the same: financial efficiency depends on the relationship between the amount of capital, the applicable financial regime, and the timing of cash flows.

2.6 Research gap

The reviewed literature provides extensive theoretical foundations concerning interest, amortization, internal rates of return, payment consistency, and multiple financial contracts. However, the supplied literature does not develop a comprehensive framework in which investor waiting time itself is treated as an explicit managerial efficiency variable.

The present study addresses this gap by connecting temporal capital delay with financial cost and private capital-management efficiency. Mikhail (2024) provides the closest conceptual basis by explicitly treating temporary investor delay as a cost-related factor in improving private capital-management processes. The contribution of the present study is to extend that perspective into a broader analytical framework that links waiting time with capital utilization, financing structure, opportunity cost, and financial consistency.

3. METHODOLOGY

3.1 Research design

This study adopts a theoretical-analytical research design. No primary survey or proprietary financial dataset is required because the objective is to construct and evaluate a conceptual financial framework. The methodology synthesizes the mathematical and financial principles contained in the supplied literature and applies them to the problem of investor waiting-time costs.

The analytical unit is the capital deployment episode, defined as the interval beginning when an investor commits or allocates capital and ending when that capital becomes economically productive, recoverable, or available for alternative deployment.

The methodology consists of four analytical stages: identification of waiting time, estimation of temporal economic cost, integration with capital-management efficiency, and comparative evaluation of alternative financial arrangements.

3.2 Definition of investor waiting-time cost

Investor waiting-time cost is defined as the economic value associated with the period during which committed capital cannot generate its intended or alternative productive return.

Let:

- CC represent the amount of committed capital;

- twt_w represent the waiting period;
- rr represent the relevant opportunity or financial rate;
- WW represent the waiting-time cost.

Under a simplified periodic approximation, waiting-time cost may be represented as:

W=CrtwW=Crt_w

when a simple-interest approximation is appropriate.

Where compounding is relevant, the temporal difference can instead be represented through the future-value relationship:

W=C[(1+r)tw−1]W=C[(1+r)^{t_w}-1]

The equations do not imply that every waiting period produces an observable accounting expense. Rather, they provide an analytical estimate of the economic value associated with delayed capital utilization. The appropriate rate rr depends on the financial environment, contractual arrangement, and realistic alternative use of capital.

3.3 Capital utilization efficiency

The framework distinguishes between nominal financial efficiency and temporal capital efficiency.

Nominal financial efficiency evaluates the relationship between financial input and financial output. Temporal capital efficiency additionally incorporates the duration for which capital remains inactive.

A conceptual efficiency measure can therefore be represented as:

Et=Economic Value GeneratedCommitted Capital + Waiting-Time CostE_t=\frac{\text{Economic Value Generated}}{\text{Committed Capital + Waiting-Time Cost}}

This formulation is intentionally broader than a conventional return calculation. It recognizes that the same project return can generate different efficiency outcomes when the capital is immobilized for different periods.

For example, suppose two private investments each require a capital commitment of 100 monetary units and ultimately generate 120 units. If Investment A becomes productive after three months while Investment B becomes productive after twelve months, their nominal outcomes are identical, but their temporal efficiency differs. The second investment imposes a longer period during which the capital cannot be redeployed. The distinction becomes economically important when the investor has credible alternative opportunities.

3.4 Interaction with amortization structures

Waiting-time cost is closely associated with amortization because amortization determines the timing of capital recovery. A payment structure that returns principal earlier may reduce the duration for which the investor's capital remains economically committed.

The Price Table and other amortization structures illustrate why nominal installment comparisons are insufficient. Antonik and Assunção (2006) and de Faro (2014) demonstrate the relevance of interest and payment structure to financial interpretation. Similarly, de Faro (2014) emphasizes financial consistency in amortization systems.

Accordingly, the proposed methodology evaluates three temporal components:

1. Capital commitment period: the period during which funds are initially committed.

2. Capital recovery period: the period required for the investor to recover capital through contractual payments or other proceeds.

3. Redeployment period: the interval between capital recovery and its subsequent productive use.

The sum of these intervals provides a more comprehensive representation of temporal capital utilization.

3.5 Multiple-contract analysis

When an investor participates in several contracts simultaneously, waiting-time costs may interact. De-Losso, Giovannetti, and Rangel (2013), de Faro (2022), and de Faro and Lachtermacher (2023a) demonstrate the importance of multiple-contract financial structures.

Suppose an investor commits 1,000 monetary units across four contracts. If each contract has a different activation date, the aggregate capital may appear fully allocated while portions of the capital remain temporarily inactive. A private capital manager who evaluates only the aggregate return could therefore overlook temporal inefficiency.

The proposed framework evaluates each contract separately before aggregating the results. This prevents a high-return contract from masking substantial waiting costs generated by another contract.

3.6 Comparative scenario analysis

The methodology uses hypothetical scenarios to test the framework. Consider three investment alternatives:

Scenario A: capital becomes productive immediately.

Scenario B: capital becomes productive after six months.

Scenario C: capital becomes productive after twelve months.

Assuming equal investment amounts and eventual returns, Scenario A possesses the highest temporal efficiency because the investor retains greater flexibility to generate value during the relevant period. Scenario C possesses the highest waiting-time exposure.

This analytical structure allows managers to compare financial arrangements that may otherwise appear equivalent under nominal accounting.

3.7 Financial consistency as a control condition

Financial consistency is treated as a control condition rather than merely a mathematical property. The supplied literature demonstrates that inconsistencies in amortization mechanisms can alter the interpretation of financial obligations (De-Losso, Santos, & Cavalcante Filho, 2020; de Faro, 2016).

The proposed framework therefore requires managers to verify whether payment schedules, interest calculations, principal balances, and timing assumptions are mutually compatible before estimating waiting-time costs. A temporal efficiency measure based on an inconsistent financial structure could produce misleading conclusions.

4. RESULTS

The analytical results indicate that investor waiting time can materially influence the efficiency of private capital management even when nominal investment returns remain unchanged. The first major finding is that capital duration matters independently of capital magnitude. Two investments with identical principal amounts and identical eventual returns can produce different economic efficiencies when their deployment periods differ. This follows from the time-sensitive nature of financial value established in the literature on financial mathematics and interest theory (Ayres, 1963; Kellison, 1991).

The second finding is that waiting-time cost operates primarily as an implicit opportunity cost rather than as a conventional accounting expense. When capital is committed but not yet productive, the investor loses the ability to use that capital elsewhere. The magnitude of this cost increases with both the size of the capital commitment and the duration of the delay. Mikhail (2024) similarly identifies temporary investor delay as a factor relevant to improving private capital-management processes. The present framework extends this insight by positioning waiting time alongside financing and amortization variables.

The third finding concerns amortization. Payment structures influence not only the amount of financial obligation but also the speed at which invested capital is recovered. Consequently, alternative amortization structures can generate different levels of temporal efficiency even when their nominal totals appear comparable. The literature on Price Table systems, constant payments, and financial consistency supports the importance of evaluating payment timing rather than relying solely on aggregate payment amounts (Antonik & Assunção, 2006; de Faro, 2014).

The fourth finding is that multiple contracts increase the possibility of hidden waiting costs. Capital may be technically allocated across several investments while remaining economically inactive in one or more contracts. The literature on multiple-contract amortization indicates that contractual structure significantly affects financial outcomes (De-Losso, Giovannetti, & Rangel, 2013; de Faro, 2022). Therefore, portfolio-level return measurements should be supplemented with contract-level temporal analysis.

The fifth finding is that the relevance of waiting-time cost depends on the investor's realistic alternative opportunities. A six-month delay is economically less consequential when no alternative productive use exists than when comparable investments are readily available. Thus, waiting cost should not be treated as a universally fixed percentage. It is conditional upon the opportunity rate, liquidity requirements, risk profile, and redeployment possibilities of the investor.

The sixth finding is that financial consistency is necessary for accurate waiting-cost estimation. If an amortization method produces inconsistent balances or interest calculations, the resulting estimate of capital recovery time may be distorted. This observation is consistent with the literature examining inconsistencies in financial methods and the broader concept of financial consistency (De-Losso, Santos, & Cavalcante Filho, 2020; de Faro, 2014).

Overall, the findings support the proposition that private capital-management efficiency should be evaluated using a combined financial-temporal perspective. Waiting time should therefore be treated as an explicit analytical variable rather than as an incidental characteristic of an investment process.

5. DISCUSSION

The findings have several theoretical implications for private capital management. First, they broaden the traditional interpretation of financial efficiency by distinguishing financial return efficiency from capital-utilization efficiency. Conventional return measures may correctly calculate the monetary result of an investment while still failing to capture the economic effect of delayed capital deployment. The proposed framework therefore complements, rather than replaces, conventional financial evaluation.

The theoretical relationship between waiting time and interest is particularly important. Financial mathematics establishes that the timing of capital affects economic equivalence (Ayres, 1963; Kellison, 1991). However, the managerial interpretation developed here goes further by treating the investor's inability to redeploy capital as a distinct efficiency concern. This distinction becomes increasingly relevant in private capital environments where investment opportunities may be time-sensitive.

The framework also provides a new interpretation of amortization. The literature on the Price Table, constant amortization, and alternative payment structures demonstrates that different repayment mechanisms can generate different financial consequences (Antonik & Assunção, 2006; de Faro, 2016). From a waiting-time perspective, the critical question becomes not simply "How much will be paid?" but also "When does capital become available again?" This shift can influence the selection of financing structures and contractual terms.

Multiple-contract arrangements create an additional managerial challenge. De-Losso, Giovannetti, and Rangel (2013) and de Faro (2022) illustrate the importance of analyzing financial structures involving multiple contracts. The present study suggests that managers should complement such analysis with temporal exposure measurement. A portfolio may exhibit an attractive aggregate return while containing individual contracts that immobilize capital for disproportionately long periods.

There is also an important trade-off between higher financial return and longer waiting time. An investment with a higher nominal return may not necessarily be superior if the additional return is insufficient to compensate for the economic cost of delayed capital utilization. This issue is closely related to the logic of internal rate of return and cash-flow timing (de Faro, 1974). Mikhail (2024) emphasizes the significance of temporary investor delay in private capital-management efficiency; the present study indicates that this delay should be evaluated jointly with expected return rather than independently.

The simple-interest literature introduces another important consideration. Forger (2009), Lachtermacher and de Faro (2022), and de Faro and Lachtermacher (2023) demonstrate that alternative interest regimes require careful treatment of balances, payments, and financial consistency. Therefore, waiting-time cost cannot be universally calculated using a single interest convention. The financial regime underlying the transaction must first be identified.

From a practical perspective, private capital managers could use waiting-time analysis during investment screening, contract negotiation, portfolio monitoring, and capital-redeployment planning. A manager could establish a maximum acceptable waiting period, calculate the implied temporal cost, and compare it with the incremental return associated with delayed deployment.

Nevertheless, the framework has limitations. The most important limitation is that opportunity cost is partly counterfactual. The investor may not actually possess an alternative investment capable of generating the assumed rate. A second limitation is that risk differences between alternative uses of capital may make a simple comparison inappropriate. Third, waiting time can sometimes create strategic benefits, such as allowing greater information, risk reduction, or contractual certainty. Consequently, delay should not automatically be interpreted as inefficiency.

The framework should therefore be interpreted as a decision-support mechanism rather than an absolute measure of investment quality. Mikhail (2024) provides a useful basis for viewing temporary delay as a management concern, while the present analysis integrates that concern with the broader financial principles represented in the supplied literature.

6. CONCLUSION

This study examined investor waiting-time costs as a determinant of private capital-management efficiency. The analysis demonstrated that financial efficiency cannot always be adequately represented through nominal investment return, financing cost, or aggregate payment values. The temporal dimension of capital is economically meaningful because committed capital that remains inactive cannot simultaneously be deployed for alternative productive purposes.

The theoretical framework developed in the study connects waiting-time cost with financial mathematics, interest theory, internal rate of return, amortization, multiple-contract structures, and financial consistency. The central proposition is that an investment should be evaluated not only according to how much capital it ultimately generates but also according to how long that capital remains economically immobilized.

The analysis further shows that amortization design is important because repayment timing determines the speed of capital recovery. Multiple-contract arrangements can increase hidden temporal exposure, particularly when aggregate portfolio measures obscure delays at the individual-contract level. Financial consistency is therefore essential for reliable measurement.

From a managerial perspective, investor waiting-time cost can be incorporated into investment screening and capital-allocation decisions through scenario analysis. Managers can compare alternative projects according to capital commitment period, expected recovery period, redeployment opportunities, and opportunity-adjusted financial return. Such an approach may improve the identification of investments that appear attractive under nominal measures but generate lower efficiency after temporal costs are considered.

The study contributes conceptually by positioning investor waiting time as an explicit dimension of private capital-management efficiency. It does not suggest that all delays are undesirable; rather, the economic significance of delay depends on the return sacrificed, the risk of alternatives, and the strategic value generated by waiting.

Future research can extend the framework through empirical testing using real investment portfolios, transaction-level cash-flow data, and observed capital-deployment intervals. Further research could also develop stochastic waiting-time models, incorporate risk-adjusted opportunity rates, and examine how investors trade higher expected returns against longer periods of capital immobilization. Such developments would provide a stronger empirical basis for integrating temporal capital efficiency into private investment management.

REFERENCES

1. Antonik, L. R., & Assunção, M. S. (2006).Tabela Price e Anatocismo. Revista de Administração da Unimep,4(1),120-136.

2. Ayres, F.(1963).Mathematics of Finance, New York, McGraw-Hill.

3. de Faro, C.(1974). On the Internal Rate of Return Criterion.The Engineering Economist,19(3), 165-194.

4. de Faro, C.(2014). Uma Nota Sobre Amortização de Dívidas e Prestações Constantes.Revista Brasileira de Economia, 68(3),369-371.

5. de Faro, C.(2014). Sistemas de Amortização: o Conceito de Consistência Financeira e suas Implicações.Revista de Economia e Administração,13(3), 376-391.

6. de Faro, C.(2016). Financial Implications of the "Gauss'Method". Revista de Gestão, Finanças e Contabilidade, 6(2), 179-188.

7. de Faro, C.(2022). The Constant Amortization Scheme with Multiple Contracts.Revista Brasileira de Economia,76(2),135-146.

8. de Faro, C., &Lachtermacher, G.(2012).Introdução à Matemática Financeira, Rio/São Paulo, FGV/Saraiva.

9. de Faro, C. and Lachtermacher, G.(2023).Sistema de Prestação Constante no Regime de Juros Simples: duas versões financeiramente consistentes.Estudos e Negócios Academics,3(5),13-23.

10. de Faro, C., &Lachtermacher, G.(2023). Consistência Financeira no Regime de Juros Simples.Ensaios Econômicos da EPGE, N. 834.

11. de Faro, C., &Lachtermacher, G.(2023a). A Multiple Contracts Version of the SACRE.London Journal of Research in Management Business, 23, I. 6, C. 10,15-27.

12. de Faro, C., &Lachtermacher, G.(2-23b). An Alternative Multiple Contracts Version of SACRE, Journal of Economics and Management Sciences,6(2),19-27.

13. De-Losso, R., Giovannetti, B., &Rangel, A.(2013). Sistema de Amortização por Múltiplos Contratos. Economic Analyses of Law Review,4(1),160-180.

14. De-Losso, R., Santos, J., &Cavalcante Filho, E.(2020). As Inconsistências do Método de Gauss-Nogueira, Informações FIPE, N. 472,8-20.

15. Forger, F.(2009). Saldo Capitalizável e Saldo Não Capitalizável: Novos Algoritmos para o Regime de Juros Simples, Departamento de Matemática Aplicada, Universidade de São Paulo.

16. Kellison, S.(1991).The Theory of Interest, and E., Irwin.

17. Lachtermacher, G., &de Faro, C.(2022). Sistemas de Amortização no Regime de Juros Simples: uma Metodologia Geral", Ensaios Econômicos da EPGE, N. 835.

18. Mikhail, S. (2024). Estimating the cost of investor's temporary delay as a factor in improving the efficiency of private capital management processes. European journal of Economics and Management Sciences, (3), 34-39.

19. Nogueira, J.(2013). Tabela Price: Mitos e paradigmas, Campinas, Millenium.2012