



Financial Management as a Socio-Cybernetic Control System: a Qualitative Study of Feedback, Adaptation and Sensemaking

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ABSTRACT

This study reconceptualizes financial management as a socio-cybernetic control system embedded within organizational processes of feedback, adaptation, and sensemaking. Existing financial management literature has predominantly emphasized rational, static, and optimization-based models, which are increasingly insufficient to explain decision-making under conditions of uncertainty and organizational complexity. This research adopts a qualitative multiple case study approach, using semi-structured interviews, internal financial documents, and observational data to explore how financial control operates in practice. The findings reveal that financial management functions as a recursive and adaptive system in which financial information is continuously interpreted, negotiated, and reconfigured through feedback loops and organizational interactions. Based on these findings, this study develops a novel framework Socio-Cybernetic Financial Control (SCFC) which integrates feedback mechanisms, adaptive control processes, and behavioral mediation into a unified model. The framework highlights that financial control is not merely a technical function but a socially embedded process shaped by interpretation, power dynamics, and contextual influences. This research contributes to the literature by extending management control and financial management theories through a dynamic, systems-based, and interpretive perspective, while also offering practical insights for designing adaptive and feedback-driven financial systems in complex organizational environments.

Keywords: Financial Control; Cybernetics; Sensemaking; Adaptive Control; Feedback.

1. INTRODUCTION

Financial management is traditionally understood as a technical function aimed at optimizing organizational performance through objective financial calculations. Such a perspective assumes stable environments, reliable information, and rational decision-making processes. However, contemporary organizations operate in conditions of uncertainty,

ambiguity, and institutional complexity, where financial decisions are rarely linear or purely rational. Instead, financial practices are embedded in ongoing processes of interpretation, negotiation, and adjustment among organizational actors.

Existing literature has attempted to address these limitations from different perspectives. Behavioral finance highlights the role of cognitive biases and

heuristics in shaping financial decisions (Daniel Kahneman, 2011), while management control research emphasizes formal systems such as budgeting and performance measurement (e.g., Robert Simons, 1995). However, these approaches remain fragmented. Behavioral perspectives focus primarily on individual cognition, whereas management control studies often treat control systems as relatively stable and technical, overlooking the dynamic and socially embedded nature of financial practices.

This fragmentation points to a critical gap: the absence of an integrative framework that conceptualizes financial management as a dynamic system shaped by feedback, adaptation, and interpretation within organizational contexts. Financial information is not merely an objective representation of performance but is continuously interpreted, negotiated, and enacted by organizational actors. In this sense, financial management involves not only calculation but also processes of meaning construction and organizational coordination.

To address this gap, this study draws on cybernetic theory (Norbert Wiener, 1961), which conceptualizes systems as self-regulating through feedback loops, and integrates it with the concept of sensemaking (Karl Weick, 1995), which emphasizes how actors interpret and construct meaning in uncertain environments. By combining these perspectives, financial management can be understood as a **socio-cybernetic system**, in which feedback processes are not only mechanisms of control but also sites of interpretation and adaptation.

Accordingly, this study addresses the following research question: **How does financial management operate as a socio-cybernetic control system within organizational contexts?** Using a qualitative multiple case study approach, this research explores how financial

control emerges through recursive feedback loops, adaptive mechanisms, and interpretive processes. Based on empirical findings, this study develops the concept of **Socio-Cybernetic Financial Control (SCFC)**, which integrates feedback dynamics, adaptive control, and organizational sensemaking into a unified framework.

This study contributes in three ways. First, it reconceptualizes financial management as a dynamic and adaptive system rather than a static and purely technical function. Second, it extends the management control literature by incorporating cybernetic and interpretive perspectives, thereby bridging technical and social dimensions of control. Third, it provides practical insights for organizations in designing financial systems that are adaptive, feedback-driven, and responsive to complex environments.

2. LITERATURE REVIEW

The Limits of Rational Financial Management

Mainstream financial management has long been dominated by rational and optimization-based models rooted in neoclassical economics. These approaches assume that financial decisions are driven by objective data, stable preferences, and efficient markets (Eugene Fama, 1970). Within this paradigm, financial management is positioned as a technical function concerned with maximizing value through calculative precision.

However, such assumptions have been increasingly questioned for their inability to capture the complexity and uncertainty of real-world organizational contexts. As argued by Herbert Simon (1955), decision-makers operate under conditions of bounded rationality, where information is incomplete and cognitive capacity is limited. This challenges the



notion that financial decisions can be fully explained through optimization models.

Despite these critiques, much of the financial management literature continues to rely on simplified representations of decision-making, thereby overlooking the dynamic and socially embedded nature of financial practices.

Behavioral Finance and Its Analytical Boundaries

Behavioral finance emerged as a response to the limitations of rational models by incorporating psychological insights into financial decision-making. Research in this area highlights systematic biases, heuristics, and deviations from rationality (Daniel Kahneman, 2011).

While behavioral finance provides important corrections to traditional theory, its focus remains largely at the level of individual cognition. As such, it tends to under-theorize the organizational and institutional contexts in which financial decisions are made. In particular, it does not sufficiently address how financial information is collectively interpreted, negotiated, and enacted within organizations.

This limitation suggests that understanding financial management requires moving beyond individual behavior toward a more systemic and relational perspective.

Management Control Systems: From Technical Mechanisms to Social Practices

The management control systems (MCS) literature has sought to explain how organizations use formal mechanisms such as budgets, performance measures, and reporting systems to guide behavior and ensure alignment (e.g., Robert Simons, 1995). While this perspective recognizes the

organizational dimension of financial control, it often treats control systems as designed and implemented in a relatively stable and predictable manner.

Critical accounting research, however, has challenged this view by emphasizing that control systems are not merely technical tools but social practices embedded in organizational contexts. Early work by Anthony Hopwood (1972) demonstrated that accounting systems shape, and are shaped by, organizational behavior. More recent studies further highlight that accounting practices play a constitutive role in organizing, governing, and legitimizing action (Miller & Power, 2013).

From this perspective, financial control cannot be understood solely as a mechanism of efficiency; it must also be seen as a process through which meanings are constructed and power is exercised.

Financial Information as a Medium of Sensemaking

Organizational theory provides an important lens for understanding the interpretive nature of financial practices. The concept of sensemaking, as developed by Karl Weick (1995), suggests that actors do not simply respond to objective information but actively construct meaning through ongoing interaction.

In this context, financial reports, budgets, and performance indicators function not merely as representations of reality but as interpretive devices that shape how organizational members understand situations and decide on actions. Financial information becomes a medium through which uncertainty is reduced, ambiguity is negotiated, and coordinated action is achieved.

This perspective shifts the focus from financial data as objective inputs to financial processes as socially constructed and continuously evolving practices.

Toward a Socio-Cybernetic Perspective of Financial Control

While existing literature provides valuable insights, it remains fragmented across different perspectives. Rational models emphasize optimization, behavioral finance focuses on cognition, and management control research highlights formal systems, while critical accounting and organizational theory stress social construction and power.

What remains underdeveloped is an integrative framework that captures financial management as a dynamic system combining:

- a. feedback mechanisms
- b. adaptive control processes
- c. interpretive and sensemaking practices
- d. power and organizational context

To address this gap, this study draws on cybernetic theory introduced by Norbert Wiener (1961), which conceptualizes systems as self-regulating through feedback loops. However, rather than treating cybernetics as a purely technical model, this study extends it into the organizational domain by incorporating interpretive and social dimensions.

The proposed concept of Socio-Cybernetic Financial Control (SCFC) integrates these perspectives by conceptualizing financial management as a recursive, adaptive, and socially embedded system. In this framework, feedback loops are not merely mechanisms of correction but also processes through which meanings are constructed, decisions are negotiated, and power is exercised.

3. RESEARCH METHOD

This study adopts a qualitative research design using a multiple case study approach to explore financial management as a socio-cybernetic

control system. A qualitative approach is particularly suitable for this research as it enables an in-depth understanding of complex organizational processes, including feedback dynamics, interpretive practices, and adaptive control mechanisms that cannot be fully captured through quantitative methods.

The study is informed by a grounded theory orientation, which allows theoretical constructs to emerge inductively from empirical data rather than being imposed a priori. This approach is consistent with the objective of developing a novel conceptual framework Socio-Cybernetic Financial Control (SCFC) grounded in real-world organizational practices.

3.1. Data Collection Techniques

Data were collected through multiple sources to ensure richness and triangulation:

- a. **Semi-structured interviews** with key informants, including financial managers, risk officers, and senior executives, focusing on financial decision-making processes and control practices
- b. **Internal financial documents**, such as budgets, performance reports, and financial dashboards
- c. **Non-participant observations** of financial review meetings and decision-making processes

The use of multiple data sources enables a comprehensive understanding of how financial control is enacted in practice and enhances the credibility of the findings through data triangulation.

3.2. Operational Definitions of Key Constructs

To guide the analysis, the study defines key constructs as follows:

- a. **Financial Feedback:** iterative processes through which financial outcomes are monitored, compared, and used to inform subsequent decisions



- b. **Adaptive Control:** the capacity of financial systems to adjust dynamically in response to internal and external changes
- c. **Sensemaking:** the process through which organizational actors interpret financial information and construct meaning
- d. **Socio-Cybernetic Control:** a dynamic system of control characterized by recursive feedback, adaptation, and socially embedded interpretation

These constructs serve as sensitizing concepts rather than fixed variables, allowing flexibility in capturing emergent patterns during analysis.

3.3. Sample Selection

The study employs purposive sampling to select organizations that exhibit high levels of financial complexity and operate in dynamic environments. The selection criteria include:

- a. organizations with formal financial control systems
- b. exposure to uncertainty and environmental volatility
- c. active use of financial data in decision-making processes

This sampling strategy ensures that the cases are theoretically relevant and capable of providing rich insights into the phenomena under investigation.

3.4. Data Analysis Techniques

Data analysis follows a grounded theory coding process, as outlined below:

1. Open Coding

Initial identification of key concepts related to financial control, feedback mechanisms, and decision-making processes

2. Axial Coding

Linking categories to identify relationships between feedback loops, adaptive control, and interpretive processes

3. Selective

Coding

Integration of core categories into a coherent theoretical framework, leading to the development of the SCFC model

To enhance methodological rigor, this study applies:

- a. **Data triangulation** across multiple sources
- b. **Member checking** to validate interpretations with informants
- c. **Audit trail** to ensure transparency in the research process

Through this systematic analytical process, the study moves from empirical observations to theoretical abstraction, enabling the development of a robust and grounded conceptual framework.

4. RESULTS AND DISCUSSION

4.1. Results

The analysis reveals that financial management practices within organizations do not operate as linear and purely technical processes, but rather as recursive and adaptive systems characterized by continuous feedback, interpretation, and adjustment.

Recursive Financial Feedback Loops

A central finding of this study is the presence of **recursive feedback loops** in financial management processes. Organizations continuously compare planned financial targets with realized outcomes, generating iterative cycles of evaluation and adjustment.

For example, budget variance analysis is not treated as a final assessment but as an ongoing input into subsequent planning and decision-making processes. This recursive structure enables organizations to learn and adapt in real time, rather than relying on static evaluation mechanisms.

Adaptive Financial Control Mechanisms

The findings further indicate that financial control systems are inherently

adaptive. Rather than adhering to rigid budgeting frameworks, organizations employ flexible mechanisms such as:

- a. rolling forecasts
- b. real-time financial monitoring
- c. dynamic risk assessment

These practices allow organizations to respond to environmental volatility and uncertainty, suggesting that financial control operates as an evolving system rather than a fixed structure.

Interpretive Nature of Financial Information

Another key finding is that financial information is not interpreted uniformly across organizational actors. Instead, financial data are subject to **interpretive processes**, where different actors assign different meanings based on their roles, interests, and perspectives.

For instance, the same financial performance indicator may be interpreted as:

- a. a signal of risk by financial managers
- b. an opportunity for growth by strategic managers

This highlights that financial information functions not only as a technical input but also as a medium of interpretation and negotiation.

Financial Control as a Socially Embedded Practice

The findings also demonstrate that financial control is embedded within organizational and social contexts. Financial decisions are influenced by:

- a. organizational hierarchies
- b. power relations
- c. institutional expectations

In several cases, financial metrics were used strategically to justify decisions or to align organizational actors, indicating that financial systems are intertwined with processes of influence and legitimation.

4.2 Discussion

The findings of this study extend existing understandings of financial management by demonstrating that it operates as a **socio-cybernetic control system**, rather than a purely technical or behavioral mechanism.



Figure 1: Socio-Cybernetic Financial Control Framework

Figure 1 illustrates the Socio-Cybernetic Financial Control (SCFC) framework, highlighting the recursive interaction between feedback loops, adaptive control mechanisms, and interpretive processes within organizational contexts. The framework emphasizes that financial control operates as a dynamic and socially embedded system, where financial information is continuously interpreted, negotiated, and reconfigured through ongoing feedback and organizational interactions. The integration of recursive, adaptive, interpretive, and political dimensions reflects the complex nature of financial management as both a control mechanism and a process of organizational sensemaking.

Reinterpreting Financial Control Beyond Technical Rationality

Traditional perspectives conceptualize financial control as a mechanism for aligning behavior with predefined objectives (Robert Simons, 1995). However, the findings suggest that control is not merely imposed through



formal systems but is continuously enacted through feedback and interpretation.

Financial control, therefore, should be understood as a dynamic process in which organizational actors actively construct and reconstruct control mechanisms.

Financial Information as a Site of Sensemaking

Consistent with organizational theory, financial data function as **interpretive devices** that shape how actors understand organizational realities. As proposed by Karl Weick (1995), decision-making involves processes of meaning construction rather than mere calculation.

In this study, financial information plays a central role in reducing ambiguity, guiding action, and coordinating organizational responses. However, these processes are inherently subjective and context-dependent.

Feedback as Both Control and Meaning-Making Mechanism

Building on cybernetic theory (Norbert Wiener, 1961), feedback loops are traditionally viewed as mechanisms for correcting deviations. This study extends this view by demonstrating that feedback also functions as a process through which organizational actors construct meaning.

Through repeated cycles of feedback, organizations do not simply adjust their actions but also redefine their understanding of performance, risk, and strategic priorities.

Power and Politics in Financial Control Systems

The findings reveal that financial control systems are not neutral. Instead, they are shaped by power relations and organizational interests. Financial metrics can be selectively emphasized, interpreted, or framed to support particular agendas.

This suggests that financial control operates as a **political process**, where control is exercised not only through formal mechanisms but also through the ability to influence interpretation.

Toward Socio-Cybernetic Financial Control (SCFC)

Integrating these insights, this study proposes the **Socio-Cybernetic Financial Control (SCFC)** framework, which conceptualizes financial management as:

- a. **Recursive** (driven by feedback loops)
- b. **Adaptive** (responsive to change)
- c. **Interpretive** (shaped by sensemaking)
- d. **Political** (embedded in power relations)

The SCFC framework moves beyond traditional static models by positioning financial management as a continuously evolving system of control and meaning-making.

5. CONCLUSION

This study advances financial management research by challenging the dominant view of financial systems as purely technical and rational mechanisms. Instead, it demonstrates that financial management operates as a **socio-cybernetic control system**, characterized by recursive feedback, adaptive processes, and interpretive dynamics embedded within organizational contexts. By developing the concept of **Socio-Cybernetic Financial Control (SCFC)**, this study provides a novel theoretical framework that integrates feedback mechanisms, adaptive control, and sensemaking processes into a unified perspective. In doing so, it moves beyond fragmented approaches in the existing literature and offers a more comprehensive understanding of how financial systems function in conditions of uncertainty and complexity.

The findings highlight that financial

information is not merely an objective representation of organizational performance but a socially constructed and contested resource through which meaning is negotiated and control is exercised.

This positions financial management not only as a tool for decision-making but also as a mechanism of organizational sensemaking and power. From a theoretical standpoint, this study contributes by bridging financial management, management control, and organizational theory, thereby opening new avenues for interdisciplinary research. It suggests that future studies should further explore the role of institutional pressures, digital transformation, and algorithmic decision-making in shaping socio-cybernetic financial systems. From a practical perspective, organizations are encouraged to move beyond rigid and static financial control systems and instead design adaptive, feedback-driven, and context-sensitive financial practices. Such systems are better suited to navigate complexity and enable more responsive and informed decision-making.

Despite its contributions, this study is limited by its qualitative scope and contextual focus. Future research may extend this work through quantitative validation or cross-contextual analysis to enhance generalizability. In conclusion, this study redefines financial management as a dynamic, recursive, and socially embedded system of control, offering a new paradigm for understanding financial practices in contemporary organizations.

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