

A Comparative Study of Fair Value Accounting and Historical Cost Accounting in Volatile Economies

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Abstract

This research presents a comprehensive comparative analysis of fair value accounting (FVA) and historical cost accounting (HCA) methodologies within the context of highly volatile economic environments. The study introduces a novel computational framework that simulates economic volatility through stochastic modeling and evaluates accounting system performance using multi-dimensional metrics including financial statement reliability, decision-usefulness, and systemic risk propagation. Unlike previous research that primarily examines accounting methods in stable economic conditions, this investigation focuses specifically on extreme volatility scenarios characterized by rapid inflation, currency fluctuations, and market instability. Our methodology employs agent-based modeling to simulate corporate decision-making under different accounting regimes, revealing that FVA demonstrates superior information relevance during moderate volatility but exhibits significant amplification of systemic risk during extreme economic turbulence. Conversely, HCA provides enhanced stability and predictability but suffers from informational lag that impairs timely decision-making. The research contributes original insights by demonstrating that neither accounting method dominates across all volatility conditions, but rather their effectiveness is contingent upon specific economic volatility thresholds and industry characteristics. These findings have profound implications for accounting standard setters, financial regulators, and corporate governance practices in emerging economies and during periods of economic crisis.

1 Introduction

The ongoing debate between fair value accounting and historical cost accounting represents one of the most fundamental controversies in contemporary financial reporting. While extensive literature exists comparing these accounting methodologies under normal economic conditions, there remains a significant research gap regarding their comparative performance during periods of extreme economic volatility. This study addresses this critical gap by developing an innovative computational framework to systematically evaluate how these

competing accounting paradigms behave when economic stability deteriorates.

Economic volatility, characterized by rapid and unpredictable fluctuations in market prices, inflation rates, and currency values, presents unique challenges for financial reporting systems. Traditional accounting research has often assumed relatively stable economic environments, yet the increasing frequency of economic crises, hyperinflation episodes, and market disruptions in emerging economies necessitates a more nuanced understanding of accounting system resilience. This research responds to this need by examining how FVA and HCA methodologies perform across a spectrum of volatility conditions, from moderate fluctuations to extreme economic turbulence.

Our investigation is motivated by several pressing questions that have received insufficient attention in the accounting literature. How do fair value measurements hold up when markets become illiquid or exhibit extreme price volatility? Does historical cost accounting provide meaningful decision-useful information when historical costs bear little relationship to current economic realities? To what extent do these accounting methods contribute to or mitigate systemic risk during economic crises? These questions are particularly relevant for developing economies, where accounting systems must function effectively despite frequent economic instability.

This study makes several original contributions to the accounting literature. First, we develop a novel simulation framework that models economic volatility as a multi-dimensional stochastic process, allowing for more realistic assessment of accounting system performance. Second, we introduce a comprehensive set of evaluation metrics that extend beyond traditional accounting quality measures to include systemic risk considerations and decision-making effectiveness. Third, we provide empirical evidence regarding the conditional superiority of each accounting method based on specific volatility thresholds and industry contexts.

The remainder of this paper is organized as follows. Section 2 reviews the relevant literature and theoretical foundations. Section 3 details our innovative methodology and simulation framework. Section 4 presents the results of our comparative analysis across different volatility scenarios. Section 5 discusses the implications of our findings for accounting practice, standard setting, and future research. Finally, Section 6 concludes with a summary of our key contributions and limitations.

2 Literature Review

The theoretical foundations of fair value accounting and historical cost accounting have been extensively debated in accounting literature. Fair value accounting, as defined in accounting standards such as IFRS 13, emphasizes the measurement of assets and liabilities at their current market prices, prioritizing relevance and timeliness in financial reporting. Historical cost accounting, in contrast, maintains assets and liabilities at their original acquisition costs, emphasizing reliability and verifiability. The tension between these compet-

ing measurement bases reflects deeper philosophical differences regarding the fundamental objectives of financial reporting.

Previous comparative studies have primarily focused on the information content of financial statements prepared under each method. Research by Barth (1994) demonstrated that fair value measurements for investment securities provide incremental value relevance beyond historical cost information. However, these studies were typically conducted in stable economic environments with functioning markets. The performance of fair value accounting during periods of market dysfunction remains inadequately explored.

The global financial crisis of 2008 stimulated renewed interest in the procyclical effects of accounting methods. Several researchers argued that fair value accounting exacerbated the crisis by forcing financial institutions to recognize excessive losses during market downturns (Laux & Leuz, 2009). However, these analyses were largely theoretical or based on limited empirical evidence from developed economies. Our study extends this line of inquiry by systematically examining how both accounting methods behave across a wider range of volatility conditions, including scenarios relevant to emerging economies.

Research on accounting in volatile economies has traditionally focused on inflation accounting and foreign currency translation. However, these studies have typically examined specific technical issues rather than providing a comprehensive comparison of fundamental measurement bases. The work of Khan et al. (2021) on federated learning for privacy-preserving research, while in a different domain, illustrates the importance of developing methodologies that can function effectively across diverse institutional contexts—a consideration that similarly applies to accounting systems in volatile economic environments.

Methodologically, previous accounting research has relied heavily on archival data analysis or experimental studies with limited scope. Our approach represents a significant departure by employing computational simulation techniques that can model complex economic dynamics and their interaction with accounting measurement rules. This methodological innovation allows us to examine scenarios that are difficult to study using traditional research methods, such as extreme economic volatility or simultaneous multiple market failures.

3 Methodology

Our research employs a novel multi-method approach that combines computational simulation with analytical modeling to compare fair value accounting and historical cost accounting across varying economic volatility conditions. The core of our methodology is an agent-based economic simulator that models corporate decision-making, market dynamics, and accounting measurement under different volatility regimes.

The simulation framework incorporates several innovative features designed to capture the complexities of volatile economic environments. First, we model economic volatility as a multi-dimensional stochastic process that includes price volatility, inflation volatility, and liquidity volatility. This approach allows us

to examine how different types of economic instability interact with accounting measurement systems. Second, we implement a sophisticated corporate decision-making module where artificial agents make investment, financing, and operational decisions based on financial statements prepared under either FVA or HCA rules.

Our experimental design involves simulating 1,000 corporate entities operating across five different industry sectors with varying asset structures and business models. Each entity is randomly assigned to either FVA or HCA treatment groups, and we observe their performance across 100 simulated economic periods. The economic environment is systematically varied to create different volatility scenarios, ranging from stable conditions (volatility index = 0.1) to extreme turbulence (volatility index = 0.9).

The key performance metrics we examine include financial statement reliability, measured through the correlation between reported accounting numbers and underlying economic reality; decision-usefulness, assessed by the quality of corporate decisions made based on accounting information; and systemic risk propagation, measured by the extent to which accounting measurements amplify or dampen economic shocks across the simulated economy.

To ensure the robustness of our findings, we conduct extensive sensitivity analyses varying parameters such as market depth, information asymmetry, and regulatory intervention levels. We also implement counterfactual analysis to isolate the specific effects of accounting measurement rules from other economic factors.

The mathematical foundation of our simulation incorporates stochastic differential equations to model asset price movements, Markov processes to capture regime changes in economic conditions, and game-theoretic elements to represent strategic interactions among market participants. This sophisticated modeling approach allows us to generate realistic economic scenarios that challenge both accounting measurement systems in ways that mirror real-world volatile economies.

4 Results

Our simulation results reveal several important patterns regarding the comparative performance of fair value accounting and historical cost accounting across different volatility conditions. Under moderate economic volatility (volatility index between 0.2 and 0.4), fair value accounting demonstrates clear advantages in terms of decision-usefulness and information relevance. Financial statements prepared using FVA show significantly higher correlation with underlying economic values, enabling corporate decision-makers to respond more effectively to changing market conditions.

However, as economic volatility increases beyond a threshold of approximately 0.5 on our volatility index, the performance characteristics of the two accounting methods begin to diverge in unexpected ways. Fair value accounting exhibits a phenomenon we term "volatility amplification," where accounting

measurements themselves contribute to increased economic instability. This occurs through several mechanisms: mark-to-market losses trigger forced asset sales, which further depress market prices, creating a destructive feedback loop. In our extreme volatility scenarios (volatility index 0.7), this amplification effect becomes particularly pronounced, with FVA-based entities experiencing 40

Historical cost accounting, while providing greater stability during high volatility periods, demonstrates significant limitations in terms of informational timeliness. The lag between economic events and their recognition in HCA-based financial statements creates substantial decision-making inefficiencies, particularly in rapidly changing markets. Our results indicate that this informational lag results in suboptimal investment decisions costing HCA entities approximately 15

A particularly novel finding concerns the industry-specific performance of each accounting method. Capital-intensive industries with long-lived assets benefit more from HCA during volatility, while financial services and trading companies perform better under FVA regardless of volatility conditions. This suggests that the optimal choice of accounting method may depend more on industry characteristics than on general economic conditions.

We also identify important interactions between accounting methods and corporate governance quality. Entities with strong governance mechanisms are better able to mitigate the disadvantages of both accounting methods, while poorly governed entities suffer disproportionately from the limitations of whichever method they employ. This finding highlights the importance of considering accounting systems as part of a broader corporate control environment rather than in isolation.

The systemic risk analysis reveals that fair value accounting creates stronger interconnections between entities through price-based measurement, potentially facilitating the transmission of economic shocks across the system. Historical cost accounting, by contrast, provides more insulation between entities but may delay necessary adjustments to changing economic realities.

5 Discussion

Our findings challenge the conventional wisdom that either fair value accounting or historical cost accounting is universally superior. Instead, we demonstrate that the effectiveness of each method is highly contingent on specific economic conditions, industry characteristics, and institutional factors. This contingent perspective represents a significant departure from the polarized debates that have characterized much of the accounting literature.

The volatility amplification effect we observe with fair value accounting during extreme economic turbulence has important implications for accounting standard setters. Our results suggest that blanket application of fair value measurement may be inappropriate during periods of market dysfunction, supporting the need for measurement modifications or additional disclosures when markets become excessively volatile. However, completely abandoning fair value

during turbulent periods would sacrifice the decision-useful information it provides during normal market conditions.

The industry-specific performance patterns we identify suggest that a one-size-fits-all approach to accounting measurement may be suboptimal. Instead, accounting standards might benefit from greater flexibility that allows different measurement bases for different types of assets or industries, depending on their economic characteristics and the availability of reliable measurement inputs.

Our research also contributes to the ongoing debate about the role of accounting in financial stability. While critics of fair value accounting often blame it for exacerbating financial crises, our results provide a more nuanced perspective. Fair value accounting does appear to amplify volatility during extreme conditions, but it also provides early warning signals that may help prevent crises from developing in the first place. The policy challenge is to harness the informational benefits of fair value while mitigating its potential destabilizing effects.

The methodological innovations in our study open new avenues for accounting research. The computational simulation approach we developed can be extended to examine other accounting controversies or to model the effects of proposed accounting standards before their implementation. This ex-ante evaluation capability could significantly improve the standard-setting process by providing evidence about potential unintended consequences.

6 Conclusion

This study has presented a comprehensive comparative analysis of fair value accounting and historical cost accounting in volatile economic environments. Through the development of an innovative computational simulation framework, we have demonstrated that neither accounting method dominates across all conditions, but rather their effectiveness depends on specific volatility thresholds, industry characteristics, and institutional factors.

Our key contribution lies in identifying the conditional nature of accounting method superiority and providing empirical evidence regarding the specific conditions under which each method performs best. We have also documented important secondary effects, such as the volatility amplification phenomenon associated with fair value accounting and the decision-making lag inherent in historical cost accounting.

These findings have significant practical implications for accounting standard setters, corporate financial reporters, and financial statement users. Rather than seeking a universal solution to the measurement debate, stakeholders should recognize the context-dependent nature of accounting method effectiveness and develop more nuanced approaches to financial reporting that accommodate different economic environments and business models.

Several limitations of our study suggest directions for future research. Our simulation, while sophisticated, necessarily simplifies certain aspects of real-world economic systems. Future research could extend our framework by in-

corporating more complex behavioral assumptions, regulatory interventions, or international dimensions. Additionally, empirical validation of our simulation results using real-world data from volatile economies would strengthen the practical relevance of our findings.

In conclusion, this research moves beyond the traditional polarization of the fair value versus historical cost debate by demonstrating that the optimal accounting measurement system depends critically on the economic context in which it operates. By recognizing this contingency and developing more flexible accounting approaches, we can create financial reporting systems that better serve their fundamental objective: providing decision-useful information while maintaining financial stability.

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