Chapter 9
Relativity of Value: Time, Space, and Context in AI-Supported Financial Decisions

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ABSTRACT

This chapter investigates the relativity of value in financial decision-making, emphasizing the roles of time, space, and contextual framing in shaping outcomes. While classical finance often treats value as an intrinsic and static property, contemporary markets reveal its dynamic and situational character. Advances in artificial intelligence allow for real-time integration of temporal patterns, spatial heterogeneity, and contextual signals, offering a more adaptive framework for evaluating assets and risks. The chapter also addresses the epistemological challenges of embedding contextual awareness into algorithmic decision-making, including issues of bias, interpretability, and robustness. By reframing value through the lens of relativity, the authors argue for a paradigm that bridges financial theory with AI-supported practice, enabling more nuanced, flexible, and context-sensitive approaches to investment and risk management.

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INTRODUCTION

The concept of value lies at the heart of finance, economics, and decision-making. From classical theories of intrinsic worth to modern behavioral accounts of utility, scholars and practitioners have long debated what constitutes value and how it can be determined. Yet value is not a fixed property of assets, contracts, or decisions. It is relational, contingent, and dynamic, shaped by the temporal horizon of decision-makers, the spatial configuration of markets, and the contextual framing of choices. This relativity of value has become increasingly visible in an era of artificial intelligence (AI), where decisions are supported by algorithms capable of processing vast datasets, simulating multiple scenarios, and adapting to evolving contexts in real time. The integration of AI into financial decision-making compels us to rethink value not as a static measure but as an emergent property of time, space, and context.

Historically, financial theory sought to anchor value in stable and universal metrics. Classical economists such as Adam Smith and David Ricardo distinguished between use value and exchange value, while later theorists like Marx emphasized labor as the foundation of value (Fine, 2018). The neoclassical revolution replaced these perspectives with a marginalist approach, defining value in terms of individual preferences and market equilibria. In finance, this translated into valuation models such as discounted cash flows, which treat future earnings as calculable in present terms, and capital asset pricing models, which link value to risk and return (Sharpe, 1964). These models assume rational actors, efficient markets, and predictable discounting of future outcomes. Yet crises, bubbles, and persistent anomalies challenge the idea that value can be objectively and universally determined (Shiller, 2015). Instead, value is constantly re-negotiated, contingent on shifting expectations, institutional settings, and socio-cultural contexts.

The relativity of value becomes evident when considering the temporal dimension of financial decisions. Time is not neutral in finance. Short-term traders, long-term investors, and regulators each perceive value differently depending on their temporal horizon. High-frequency trading algorithms may extract value from millisecond price discrepancies, while pension funds evaluate assets in terms of decades. The same financial instrument