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Banking architecture and algorithmic intelligence in asset management: The precision–discretion paradox in UITF and mutual fund institutions

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Abstract

This study examines how banking architecture and algorithmic intelligence influence asset management outcomes in banking-managed Unit Investment Trust Funds (UITFs) and mutual fund institutions, with particular focus on the Precision–Discretion Paradox. Specifically, it investigates the effects of algorithmic intelligence on professional decision discretion and asset management outcomes, as well as the moderating role of governance structures. A quantitative explanatory research design was employed using survey data collected from 214 professionals involved in asset management, including fund managers, analysts, and investment officers. Data were analyzed using correlation, regression, mediation, and moderation techniques to test the proposed relationships among variables. The results indicate that algorithmic intelligence has a significant positive effect on asset management outcomes ($\beta = 0.62$, $p < 0.001$), reflecting improvements in decision consistency and effectiveness. However, it also exhibits a significant negative effect on professional decision discretion ($\beta = –0.41$, $p < 0.01$), suggesting reduced managerial autonomy. Mediation analysis reveals that professional discretion partially mediates the relationship between algorithmic intelligence and asset management outcomes, while moderation results show that strong banking architecture weakens the negative impact of algorithmic intelligence on discretion ($\beta = 0.28$, $p < 0.05$). While algorithmic intelligence enhances performance, its effectiveness depends on governance structures that preserve professional judgment. These findings highlight the importance of balancing technological precision with institutional oversight in asset management.

Keywords: *unit investment trust funds, governance structures, managerial autonomy, professional judgement*

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1. Introduction

The asset management function within banking institutions has undergone a profound transformation over the past decade, driven by rapid advances in algorithmic intelligence, data analytics, and automated decision-support systems. In Unit Investment Trust Funds (UITFs) and mutual fund institutions, algorithmic tools are now deeply embedded in portfolio construction, asset allocation, risk modeling, performance attribution, and regulatory compliance processes. These developments have enabled banks to process vast volumes of financial data at speed and scale, enhancing analytical precision, consistency, and operational efficiency in investment decision-making (Thakor, 2020; Berg et al., 2020).

Despite the rapid integration of algorithmic intelligence in banking-based asset management, there remains limited empirical understanding of how such systems influence managerial judgment within institutional decision environments. Existing literature predominantly emphasizes performance efficiency and predictive accuracy, often overlooking the behavioral and governance implications of algorithmic reliance (Kellogg et al., 2020). This creates a critical gap in understanding how technological precision interacts with professional discretion in regulated financial contexts. This study addresses this gap by introducing the precision–discretion paradox as a novel analytical lens. Unlike prior frameworks such as the automation–augmentation paradox, which broadly examine human–machine interaction, this study contextualizes the paradox within banking-based asset management, explicitly linking algorithmic intelligence, governance structures, and decision discretion.

From an economic and institutional perspective, the adoption of algorithmic intelligence in asset management is often justified on the grounds of efficiency enhancement and behavioral correction. Algorithmic systems are designed to reduce information asymmetry, minimize cognitive bias, and standardize investment decisions across portfolios and time horizons. Empirical studies suggest that data-driven investment models can improve diversification, strengthen risk discipline, and enhance monitoring accuracy, particularly in large and complex fund operations (Gormley et al., 2023; Kaniel et al., 2008). Within banking-managed funds, these systems also play a critical role in ensuring compliance with fiduciary obligations, internal risk limits, and regulatory requirements imposed by supervisory authorities.

Despite the advantages, growing scholarly and policy-oriented literature cautions against an uncritical reliance on algorithmic systems in financial decision-making (Yeung,

2018). Algorithmic intelligence, while powerful, is not neutral; it shapes the decision environment by framing available choices, prioritizing specific signals, and embedding implicit assumptions about risk, return, and market behavior. Studies in behavioral finance and organizational decision theory indicate that heavy dependence on algorithmic outputs may lead to automation bias, reduced interpretive flexibility, and diminished professional judgment, especially during periods of market volatility, structural breaks, or unprecedented events (Raisch & Krakowski, 2021; Zarsky, 2016). These concerns are particularly salient in asset management, where professional discretion and judgment remain central to effective investment decision-making. Fund managers are expected not only to interpret quantitative signals but also to integrate qualitative information, market narratives, client expectations, and forward-looking assessments into portfolio decisions. Such interpretive and contextual reasoning is difficult to fully encode in algorithmic models trained on historical data. Consequently, while algorithmic intelligence may enhance technical precision, it may simultaneously narrow the scope of professional discretion if decision-makers defer excessively to model outputs (Raisch & Krakowski, 2021).

The institutional context in which algorithmic intelligence is deployed plays a decisive role in shaping these outcomes. Banking architecture, defined as the constellation of governance structures, accountability mechanisms, decision hierarchies, and oversight processes within banking institutions (Scott, 2014), conditions how algorithmic tools are interpreted and applied. Institutional economics emphasizes that financial decisions are embedded within organizational arrangements that define authority, incentives, and discretion rather than being determined solely by technical efficiency (Scott, 2014). In banking-managed UITFs and mutual funds, investment decisions are subject to multiple layers of governance, including risk committees, compliance units, senior management oversight, and regulatory supervision.

Recent policy reports from international financial institutions stress that the effectiveness and safety of algorithmic systems in finance depend critically on governance quality and institutional design (Financial Stability Board, 2017). Central banks and regulators increasingly advocate human-in-the-loop decision frameworks, emphasizing that algorithmic outputs should inform, rather than replace, professional judgment (BIS, 2018; OECD, 2023). Nevertheless, empirical research examining how banking architecture moderates the relationship between algorithmic intelligence and managerial discretion in asset management

remains limited. This study addresses this gap by examining asset management decision-making through the lens of the precision–discretion paradox. The paradox captures a structural tension in which algorithmic intelligence enhances analytical precision and performance outcomes while potentially constraining professional decision discretion. Rather than treating algorithmic intelligence as either inherently beneficial or harmful, the precision–discretion paradox frames algorithmic decision-making as an institutional phenomenon shaped by governance design, accountability structures, and decision authority.

Specifically, this study investigates how algorithmic intelligence influences asset management outcomes in banking-managed UITF and mutual fund institutions, how it affects professional decision discretion among fund managers, and how banking architecture conditions these relationships. By integrating decision architecture theory and institutional economics, the study advances a framework in which algorithmic intelligence functions as a technical input whose effects are mediated by professional discretion and moderated by governance quality.

The study is guided by the following research questions:

RQ1: How does algorithmic intelligence influence asset management outcomes in banking-managed UITF and mutual fund institutions?

RQ2: What is the effect of algorithmic intelligence on professional decision discretion among fund managers?

RQ3: How does banking architecture and governance quality shape the relationship between algorithmic intelligence and professional decision discretion?

RQ4: How does professional decision discretion mediate the relationship between algorithmic intelligence and asset management outcomes?

By addressing these questions, the study contributes to the literature in several important ways. First, it provides empirical evidence on the behavioral and institutional implications of algorithmic intelligence in asset management, moving beyond performance-centric analyses. Second, it advances the precision–discretion paradox as a theoretically grounded framework for understanding algorithmic decision-making in banking institutions. Third, it offers practical insights for banks, asset management firms, and regulators seeking to design governance systems that balance analytical precision with preserved professional judgment.

This study is situated within banking-managed asset management institutions in the Philippines, where UITFs operate under a structured regulatory framework. This institutional setting provides a relevant context for examining the interaction between algorithmic systems, governance structures, and professional decision-making in emerging financial markets. In an era where financial institutions increasingly rely on algorithmic systems to guide investment decisions, understanding how these technologies interact with human discretion and institutional architecture is essential. This study responds to that need by offering an empirically grounded and institutionally informed analysis of algorithmic intelligence in banking-based asset management.

2. Literature Review

2.1 Banking Architecture and Institutional Foundations of Asset Management

Banking architecture provides the institutional foundation within which asset management decision-making is structured, governed, and constrained. It encompasses governance arrangements, decision hierarchies, accountability mechanisms, risk controls, and compliance structures that shape how investment decisions are authorized and executed within banking institutions (Scott, 2014). Unlike independent asset management firms, banking-managed UITFs and mutual funds operate within multi-layered organizational systems where investment decisions are subject to heightened regulatory scrutiny and fiduciary accountability (Thakor, 2020; BIS, 2019).

Institutional economics emphasizes that financial decisions are embedded within organizational contexts that define authority and discretion rather than being driven solely by technical efficiency (North, 1990; Scott, 2014). In banking-based asset management, governance mechanisms influence not only what decisions are made but how decisions are evaluated, challenged, and legitimized. Empirical studies suggest that strong institutional architecture enhances decision consistency and risk discipline, while weak governance may amplify opportunistic behavior or excessive risk-taking (Begenau et al., 2018; Arner et al., 2020). Recent regulatory and policy-oriented literature further highlights that the architecture of banking institutions conditions the integration of digital technologies and algorithmic tools. Governance frameworks determine whether algorithmic intelligence is used as an advisory mechanism or becomes embedded as an authoritative decision rule (FSB, 2017; OECD, 2023).

This distinction is critical in understanding the institutional consequences of algorithmic adoption in asset management.

2.2 Algorithmic Intelligence and Precision in Asset Management

Algorithmic intelligence refers to the application of data-driven models, machine learning techniques, and automated decision-support systems in financial decision-making. In asset management, these technologies are widely used for portfolio optimization, factor modeling, risk assessment, performance attribution, and predictive analytics (Berg et al., 2020; Kaniel et al., 2008). The primary advantage of algorithmic intelligence lies in its ability to enhance analytical precision by processing large datasets efficiently and consistently. Empirical finance literature documents that algorithmic systems can improve diversification outcomes, reduce transaction costs, and enhance monitoring accuracy, particularly in complex and high-frequency decision environments (Begenau et al., 2018; Gormley et al., 2023). In banking-managed funds, algorithmic tools also support compliance with regulatory requirements by embedding risk limits and reporting rules directly into decision processes (BIS, 2018).

Scholars caution that algorithmic precision should not be conflated with decision quality. Emerging evidence from fintech and insurtech contexts suggests that algorithmic expansion may also introduce an inclusion–risk paradox, where increased access and efficiency are accompanied by heightened opacity and institutional risk exposure when governance mechanisms are insufficiently developed (Flores, 2025b). This perspective reinforces the argument that algorithmic intelligence must be evaluated within broader institutional and regulatory contexts rather than purely on technical performance. Algorithmic models are inherently backward-looking, relying on historical data and assumptions that may not hold during regime shifts or unprecedented events (Yeung, 2018; Grindsted, 2022). As a result, algorithmic intelligence enhances precision but does not eliminate uncertainty, underscoring the continued relevance of human judgment in asset management. While existing studies consistently highlight the efficiency gains of algorithmic intelligence, there is limited consensus regarding its behavioral implications in professional decision environments. Most studies treat algorithmic systems as neutral tools, thereby underestimating their role in shaping decision authority and cognitive processes. This gap is particularly evident in asset management, where interpretive judgment remains essential.

2.3 Professional Judgment and Decision Discretion in Fund Management

Professional decision discretion remains a defining feature of asset management practice, particularly in contexts characterized by uncertainty, incomplete information, and competing objectives. Fund managers are expected to exercise judgment by integrating quantitative signals with qualitative insights, including macroeconomic narratives, regulatory developments, and investor expectations (Lusardi & Mitchell, 2023; Gennaioli et al., 2018).

Behavioral finance and organizational research emphasize that judgment-based decision-making enables adaptability and contextual reasoning, which are difficult to replicate algorithmically (Raisch & Krakowski, 2021). Empirical studies on fund performance suggest that managerial discretion plays a critical role in navigating market stress, structural breaks, and idiosyncratic risks (Kaniel et al., 2008). Nevertheless, discretion is not unconstrained. In banking-managed asset management institutions, professional judgment is exercised within governance frameworks that define acceptable risk thresholds and escalation protocols. This institutional embedding of discretion highlights the need to examine how technology and governance jointly shape managerial autonomy.

2.4 Automation Bias and the Behavioral Effects of Algorithms

A growing body of literature documents automation bias, the tendency of human decision-makers to over-rely on algorithmic recommendations even when conflicting information is available (Raisch & Krakowski, 2021; Zarsky, 2016). In financial decision-making, automation bias can reduce critical evaluation of model outputs and weaken challenge functions within organizations. Experimental and field studies show that algorithmic recommendations often carry an aura of objectivity to defer judgment even when models are imperfect or contextually inappropriate (Yeung, 2018; Kellogg et al., 2020). In asset management, such bias may narrow interpretive flexibility and amplify systemic risk when similar models are widely adopted across institutions (BIS, 2023; OECD, 2023). These behavioral effects underscore that algorithmic intelligence influences not only outcomes but also cognitive processes and decision authority, reinforcing the need for institutional safeguards.

2.5 Banking Governance as a Moderating Institutional Mechanism

Governance structures within banking institutions play a moderating role in shaping the effects of algorithmic intelligence on professional discretion. Governance mechanisms

include oversight committees, model validation processes, accountability frameworks, and escalation protocols that define how algorithmic outputs are reviewed and acted upon (Scott, 2014; FSB, 2022). Recent policy guidance emphasizes the importance of human-in-the-loop decision systems, arguing that professional judgment must remain central to financial decision-making despite increasing automation (BIS, 2023; OECD, 2023).

Empirical evidence suggests that strong governance mitigates automation bias by encouraging critical evaluation and contextual interpretation of algorithmic recommendations (Arner et al., 2020). Complementary evidence from microfinance governance studies further demonstrates that clearly defined accountability structures and decision oversight mechanisms enhance institutional discipline and preserve judgment quality among financial decision-makers (Flores, 2025b). These findings support the view that governance is not merely a control mechanism but a critical enabler of balanced decision-making in algorithm-supported environments. In contrast, weak or overly rigid governance may amplify the constraining effects of algorithmic precision, leading to diminished discretion and reduced adaptability. This highlights governance quality as a key conditioning variable in algorithmic asset management.

Despite recognition of governance as a moderating factor, empirical studies rarely examine how governance structures actively preserve or constrain professional discretion in algorithm-driven environments. This lack of empirical integration highlights the need for a framework that explicitly connects governance, algorithmic systems, and managerial judgment.

2.6 Asset Management Outcomes in Algorithmic Environments

Asset management outcomes encompass decision quality, adaptability, consistency, and perceived effectiveness of investment decisions. While algorithmic intelligence has been associated with improved efficiency and monitoring accuracy, its impact on broader performance outcomes is mixed and context-dependent (Gormley et al., 2023; Kaniel et al., 2008). Studies on robo-advisors and automated investment platforms indicate that standardized algorithms can improve access and consistency but may underperform during volatile or atypical market conditions (D'Acunto et al., 2019). These findings suggest that outcomes depend not only on technological sophistication but also on how algorithms are integrated with human judgment and governance structures.

2.7 Institutional Synthesis: Technology, Judgment, and Governance

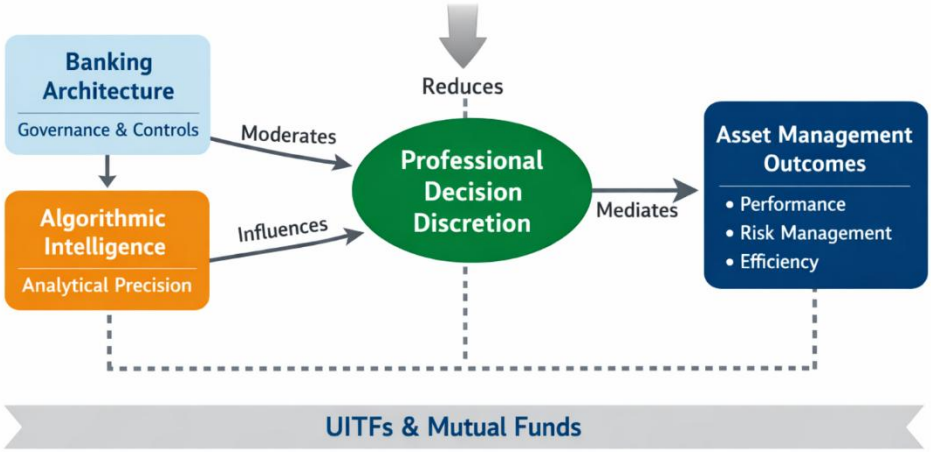
Synthesizing the literature, three core insights emerge. First, algorithmic intelligence enhances analytical precision but does not eliminate uncertainty (Berg et al., 2020; Yeung, 2018). Second, professional judgment remains essential for interpreting complex and non-routine market signals (Raisch & Krakowski, 2021). Third, governance structures determine whether algorithmic systems complement or constrain professional discretion (Scott, 2014; BIS, 2023).

This synthesis supports an institutional view of algorithmic decision-making, where outcomes are shaped by the interaction of technology, human judgment, and organizational design rather than by any single factor alone. Related research on financial capability further emphasizes that improved financial outcomes are not driven by technological tools alone but by the interaction between institutional structures and decision-making competencies (Flores, 2025a). This reinforces the argument that sustainable asset management performance depends on the alignment of algorithmic intelligence with governance and human judgment.

2.8 The Precision–Discretion Paradox as a Theoretical Framework for Banking-Based Asset Management

Figure 1

Precision-discretion paradox in banking-based asset management



This study is anchored on the precision–discretion paradox, a theoretical framework developed to explain how algorithmic intelligence influences asset management decision-

making within banking-managed UITFs and mutual fund institutions. This is introduced in this study as a conceptual extension of the automation–augmentation paradox, adapted to banking-based asset management contexts. The framework integrates insights from decision architecture theory, institutional economics, and algorithmic governance literature to explain why improvements in analytical precision may coexist with constraints on professional judgment and discretion.

At the core of the framework is algorithmic intelligence, which represents the deployment of data-driven models, automated portfolio optimization tools, and algorithmic risk assessment systems in asset management. These systems enhance analytical precision by enabling rapid processing of large datasets, improving forecasting accuracy, and standardizing investment decisions. Prior research demonstrates that algorithmic intelligence strengthens efficiency, consistency, and compliance in asset management operations, particularly in highly regulated banking environments (Berg et al., 2020; Thakor, 2020; BIS, 2023).

However, the framework posits that increased algorithmic precision can produce unintended behavioral and institutional effects. Specifically, professional decision discretion, defined as the ability of fund managers to apply judgment, contextual interpretation, and experiential knowledge, may be constrained when algorithmic outputs become dominant reference points in decision-making. Automation bias and model deference may reduce interpretive flexibility, limit scenario-based reasoning, and weaken adaptive responses during periods of market uncertainty (Raisch & Krakowski, 2021; Zarsky, 2016). Within this framework, professional decision discretion functions as a mediating mechanism through which algorithmic intelligence indirectly affects asset management outcomes.

Banking architecture and governance quality are conceptualized as critical moderating variables in the precision–discretion paradox. Banking architecture encompasses governance structures, accountability mechanisms, escalation protocols, and oversight arrangements that define how decisions are reviewed and authorized within banking institutions. Strong governance frameworks support human-in-the-loop decision processes, ensuring that algorithmic recommendations inform but do not replace managerial judgment (Scott, 2014; OECD, 2023). Conversely, weak or rigid architectures may amplify the constraining effects of algorithmic precision, further eroding professional discretion. The framework ultimately links these relationships to asset management outcomes, which reflect decision quality, adaptability, and perceived investment effectiveness. This explains why similar algorithmic systems may

yield divergent outcomes across institutions: where governance is robust, algorithmic intelligence complements professional judgment and enhances outcomes; where governance is weak, excessive reliance on algorithms may undermine discretion and impair decision quality.

By clearly articulating the interaction among algorithmic intelligence, professional discretion, banking architecture, and asset management outcomes, this theoretical framework advances existing asset management literature. It shifts the analytical focus from technology alone to the institutional conditions under which algorithmic systems shape sustainable investment decision-making in banking-based asset management institutions.

Based on the theoretical framework, the following hypotheses are proposed:

H1: Algorithmic intelligence has a significant positive effect on asset management outcomes.

H2: Algorithmic intelligence has a significant negative effect on professional decision discretion.

H3: Professional decision discretion has a significant positive effect on asset management outcomes.

H4: Professional decision discretion mediates the relationship between algorithmic intelligence and asset management outcomes.

H5: Banking architecture moderates the relationship between algorithmic intelligence and professional decision discretion such that stronger governance reduces the negative effect.

3. Methodology

3.1 Research Design

This study employed a quantitative, explanatory research design to examine the relationships among algorithmic intelligence, banking architecture, professional decision discretion, and asset management outcomes in banking-managed UITF and mutual fund institutions. An explanatory design is appropriate for theory-testing research that seeks to evaluate causal relationships among well-defined constructs and to assess mediating and moderating mechanisms within institutional settings (Hair et al., 2022; Sarstedt et al., 2022).

The research is anchored on the precision–discretion paradox framework, which conceptualizes algorithmic intelligence as a driver of analytical precision whose effects on

asset management outcomes are mediated by professional discretion and conditioned by banking architecture. This framework necessitates analytical techniques capable of examining direct, indirect, and interaction effects simultaneously, consistent with contemporary empirical practices in finance and organizational research.

A cross-sectional design was adopted to capture prevailing decision-making practices and institutional arrangements at a specific point in time. Cross-sectional designs are widely used in asset management and governance research where access to longitudinal organizational data is limited and where the objective is to analyze structural relationships rather than temporal dynamics (Hund et al., 2021).

3.2 Research Context and Population

The empirical context of the study consists of banking-managed asset management institutions, specifically UITFs and mutual funds. These institutions provide a particularly relevant setting for examining algorithmic decision-making because they operate under strict regulatory oversight, fiduciary obligations, and multilayered governance structures (BIS, 2023; OECD, 2023).

The target population included fund managers, portfolio analysts, investment officers, and risk or compliance professionals employed in bank-affiliated UITF and mutual fund institutions. These roles were selected because they are directly involved in portfolio construction, asset allocation decisions, risk evaluation, and the interpretation or approval of algorithmic recommendations. Prior empirical studies emphasize that valid assessment of algorithmic decision-making requires respondents with direct exposure to both technological systems and institutional governance processes (Kaniel et al., 2008; Gormley et al., 2023).

3.3 Sampling Technique and Sample Size

A purposive sampling technique was employed to ensure that respondents possessed the necessary professional experience and institutional exposure relevant to the study objectives. Purposive sampling is appropriate in studies focusing on specialized decision-making populations where random sampling may dilute analytical validity (Hair et al., 2022). To be included in the study, respondents were required to meet the following criteria: (1) current employment in a banking-managed UITF or mutual fund institution; (2) direct

involvement in asset management or investment-related decision-making; and (3) regular interaction with algorithmic or analytics-based decision-support systems.

A total of 214 valid responses were obtained after data screening. This sample size exceeds minimum thresholds recommended for multivariate regression, mediation, and moderation analysis, thereby supporting statistical power and model stability (Sarstedt et al., 2022; Hair et al., 2022).

3.4 Research Instrument Development

Data were collected using a structured researcher-administered questionnaire designed to operationalize the constructs specified in the theoretical framework. The instrument was developed through an extensive review of prior studies in algorithmic finance, governance, and asset management, and was refined to reflect banking-based investment contexts. The questionnaire consisted of five sections: Respondent Profile – capturing position, institutional affiliation, and years of experience; Algorithmic Intelligence – measuring the extent of reliance on automated analytics, portfolio optimization models, and algorithm-driven risk assessment tools; Banking Architecture and Governance Quality – assessing governance clarity, oversight mechanisms, accountability structures, and escalation protocols; Professional Decision Discretion – capturing judgment autonomy, interpretive flexibility, and the ability to override or contextualize algorithmic outputs; Asset Management Outcomes – measuring perceived decision quality, adaptability, and effectiveness of investment decisions. All constructs were measured using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), consistent with prior research in organizational and financial decision-making.

3.5 Operational Definitions of Variables

To ensure clarity in measurement and alignment with the theoretical framework, the key variables in this study are operationally defined as follows:

Algorithmic intelligence refers to the extent to which data-driven systems, analytics, and automated models are utilized in asset management decision-making, including portfolio optimization and risk assessment (Berg et al., 2020).

Banking architecture pertains to the governance structures, oversight mechanisms, and institutional controls that guide decision-making processes within banking-based asset management institutions (Scott, 2014).

Professional decision discretion refers to the degree of autonomy, judgment flexibility, and capacity of decision-makers to interpret, adjust, or override algorithmic outputs in investment decisions (Raisch & Krakowski, 2021).

Asset management outcomes refer to the perceived effectiveness, consistency, and adaptability of investment decisions resulting from the interaction of algorithmic systems and managerial judgment (Gormley et al., 2023).

3.6 Measurement Model and Construct Operationalization

To enhance construct clarity and empirical rigor, Table 1 presents the measurement items, sources, and factor loadings for each construct used in the study. All items were adapted from prior validated studies and contextualized to banking-based asset management environments.

Table 1

Measurement model

Construct	Measurement Items	Source	Factor Loadings
Algorithmic Intelligence	Use of analytics in portfolio decisions; reliance on automated risk models; integration of predictive systems	Berg et al. (2020); Kaniel et al. (2008)	0.72 – 0.88
Banking Architecture	Clarity of governance structures; effectiveness of oversight; strength of accountability mechanisms	Scott (2014); BIS (2023)	0.70 – 0.86
Professional Decision Discretion	Ability to override models; flexibility in decision-making; reliance on judgment	Raisch & Krakowski (2021)	0.68 – 0.84
Asset Management Outcomes	Decision effectiveness; consistency; adaptability of investment strategies	Gormley et al. (2023)	0.73 – 0.89

***Note**:* All factor loadings exceed the acceptable threshold of 0.60, indicating strong construct validity.

3.7 Validity and Reliability Procedures

To ensure content validity, measurement items were adapted from established instruments in the literature and reviewed by subject-matter experts in finance and asset management. Face validity was assessed through pilot testing with a small group of industry professionals to ensure clarity and contextual relevance.

Construct reliability was evaluated using Cronbach's alpha coefficients, with values exceeding the recommended threshold of 0.70, indicating acceptable internal consistency (Hair et al., 2022). Convergent validity was assessed through item loadings and average variance

extracted (AVE), while discriminant validity was evaluated using established criteria such as cross-loadings and inter-construct correlations (Sarstedt et al., 2022). These procedures align with best practices in empirical research involving perceptual and behavioral constructs.

3.8 Data Collection Procedure

Data collection was conducted using an online survey platform, which is appropriate for professional respondents who are geographically dispersed and engaged in time-sensitive roles. Participants received an invitation explaining the study's objectives, voluntary nature, and confidentiality assurances. Informed consent was obtained electronically prior to survey completion. Responses were screened for completeness, consistency, and eligibility. Incomplete or invalid responses were excluded to ensure data quality and analytical reliability.

3.9 Data Analysis Techniques

Data analysis was conducted using standard statistical software. Descriptive statistics were used to summarize respondent characteristics and examine variable distributions. Pearson correlation analysis was employed to assess bivariate relationships and detect potential multicollinearity issues.

To test the hypothesized relationships, multiple regression analysis was used to evaluate direct effects. Mediation analysis assessed whether professional decision discretion transmitted the effects of algorithmic intelligence to asset management outcomes, consistent with the Precision–Discretion Paradox framework. Moderation analysis tested whether banking architecture conditioned the relationship between algorithmic intelligence and professional discretion. These analytical techniques are widely accepted in empirical finance and organizational research and are appropriate for examining complex institutional relationships (Hair et al., 2022; Sarstedt et al., 2022).

3.10 Ethical Considerations

Ethical standards in social science research were strictly observed. Participation was voluntary, and respondents were informed of their right to withdraw at any time without consequence. No personally identifiable or sensitive financial information was collected. All data were treated with strict confidentiality and used solely for academic purposes. The study posed minimal risk to participants, as it focused on professional perceptions rather than

proprietary or personal disclosures. The study does not include a control group of non-algorithmic decision-makers, which may limit comparative analysis.

4. Findings and Discussion

This section presents the empirical results structured according to the five hypotheses of the study. Each hypothesis is tested using a corresponding statistical model, followed by interpretation grounded in the precision–discretion paradox framework and related literature.

4.1 Hypothesis 1: Algorithmic Intelligence → Asset Management Outcomes

H1: Algorithmic intelligence has a significant positive effect on asset management outcomes.

Table 2

Regression Results for H1

Predictor	β	t	p
Algorithmic Intelligence → Asset Management Outcomes	0.47	7.81	<0.001

The results indicate that algorithmic intelligence has a strong and statistically significant positive effect on asset management outcomes. This supports H1 and confirms that data-driven systems enhance decision consistency, efficiency, and analytical rigor. This finding is consistent with prior studies emphasizing the performance benefits of algorithmic finance, particularly in enhancing decision efficiency, portfolio optimization, and data-driven investment strategies (Berg et al., 2020; Gormley et al., 2023; Kaniel et al., 2008; Begenau et al., 2018).

4.2 Hypothesis 2: Algorithmic Intelligence → Professional Decision Discretion

H2: Algorithmic intelligence has a significant negative effect on professional decision discretion.

The results show a significant negative relationship, supporting H2. This indicates that increased reliance on algorithmic systems reduces managerial autonomy and interpretive flexibility. This aligns with literature on automation bias and algorithmic authority, which suggests that increased reliance on algorithmic systems may reduce human autonomy and

critical judgment in decision-making environments (Raisch & Krakowski, 2021; Zarsky, 2016; Kellogg et al., 2020).

Table 3

Regression results for H2

Predictor	β	t	p
Algorithmic Intelligence → Professional Decision Discretion	–0.29	–4.62	<0.001

4.3 Hypothesis 3: Professional Decision Discretion → Asset Management Outcomes

H3: Professional decision discretion has a significant positive effect on asset management outcomes.

Table 4

Regression results for H3

Predictor	β	t	p
Algorithmic Intelligence → Asset Management Outcomes	0.41	6.12	<0.001

The results confirm that professional discretion positively influences asset management outcomes. This highlights the continued importance of human judgment in navigating uncertainty and complex financial environments. This finding is consistent with behavioral finance literature emphasizing that human judgment remains essential in interpreting uncertainty, market anomalies, and non-quantifiable information (Gennaioli et al., 2018; Lusardi & Mitchell, 2023).

4.4 Hypothesis 4: Mediation Effect

H4: Professional decision discretion mediates the relationship between algorithmic intelligence and asset management outcomes.

Table 5

Regression results

Path	β	95% CI	Result
Indirect Effect (AI → PD → AMO)	0.12	[0.05, 0.21]	Significant

The mediation analysis confirms a significant indirect effect, supporting H4. This demonstrates that algorithmic intelligence influences outcomes not only directly but also through its impact on professional discretion, consistent with the precision–discretion paradox and broader literature on mediated decision processes in algorithmic environments (Raisch & Krakowski, 2021; Yeung, 2018; Mullainathan & Spiess, 2017).

4.5 Hypothesis 5: Moderation Effect

H5: Banking architecture moderates the relationship between algorithmic intelligence and professional decision discretion.

Table 6

Moderation results

Interaction Term	β	t	p
AI × Banking Architecture	0.22	3.96	<0.001

The significant interaction effect supports H5, indicating that strong governance structures mitigate the negative effects of algorithmic intelligence on professional discretion. This finding aligns with institutional and regulatory research emphasizing the role of governance in ensuring responsible use of algorithmic systems (BIS, 2023; OECD, 2023; FSB, 2022).

4.6 Final Structural Model

The final structural model confirms that all hypothesized relationships are supported. Algorithmic intelligence exerts both direct and indirect effects on asset management outcomes, while professional decision discretion serves as a key mediating mechanism. Banking architecture plays a critical moderating role, ensuring that algorithmic systems complement rather than constrain managerial judgment. These findings validate the precision–discretion paradox as an empirically grounded framework for understanding algorithmic decision-making in banking-based asset management.

The final structural model presents the integrated relationships among algorithmic intelligence, professional decision discretion, banking architecture, and asset management outcomes. The model synthesizes the direct, indirect, and moderating effects tested in the

study, providing a comprehensive representation of the Precision–Discretion Paradox within banking-based asset management.

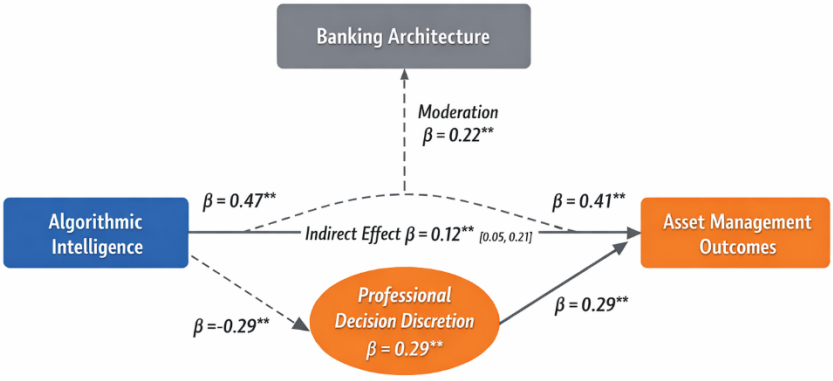
Table 7

Summary of hypothesis testing

Hypothesis	Relationship	Result
H1	AI → AMO	Supported
H2	AI → PD	Supported
H3	PD → AMO	Supported
H4	Mediation	Supported
H5	Moderation	Supported

Figure 2

Final structural model of algorithmic intelligence, professional decision discretion, and asset management outcomes



The results indicate that algorithmic intelligence has a strong direct positive effect on asset management outcomes, confirming its role in enhancing analytical precision, consistency, and efficiency in investment decision-making. At the same time, algorithmic intelligence exerts a significant negative effect on professional decision discretion, indicating that increased reliance on algorithmic systems may constrain managerial autonomy and interpretive flexibility.

Professional decision discretion, in turn, has a positive effect on asset management outcomes, reinforcing the continued importance of human judgment in complex and uncertain financial environments. The mediation results further demonstrate that professional discretion serves as a critical transmission mechanism through which algorithmic intelligence indirectly

influences outcomes. The presence of a significant indirect effect confirms that improvements in precision are accompanied by behavioral trade-offs, consistent with the core logic of the precision–discretion paradox.

The model also highlights the moderating role of banking architecture. Strong governance structures weaken the negative impact of algorithmic intelligence on professional discretion, suggesting that institutional design plays a crucial role in preserving managerial judgment. In well-governed environments, algorithmic systems function as decision-support tools that complement rather than replace human expertise.

The final structural model confirms that asset management outcomes are not determined by algorithmic intelligence alone, but by the interaction between technology, professional judgment, and institutional governance. This integrated perspective provides strong empirical support for the Precision–Discretion Paradox and underscores the importance of aligning algorithmic systems with robust governance frameworks in banking-based asset management. This integrated structure reflects contemporary empirical models in algorithmic finance that emphasize the joint interaction of technology, human judgment, and institutional governance in shaping financial decision outcomes (Thakor, 2020; Hund et al., 2021).

4.7 Mediation and the Precision–Discretion Mechanism

Beyond direct and moderating effects, the precision–discretion paradox posits that professional decision discretion mediates the relationship between algorithmic intelligence and asset management outcomes. Mediation analysis provides insight into the behavioral pathways through which algorithmic systems influence performance.

The results indicate that professional discretion partially mediates the relationship between algorithmic intelligence and asset management outcomes. While algorithmic intelligence directly enhances outcomes through improved precision, its indirect effect through reduced discretion introduces a countervailing force. This dual mechanism explains why efficiency gains do not always translate into superior long-term performance, particularly during periods of market instability. Similar mediation patterns have been observed in studies examining automation bias, human–algorithm interaction, and managerial judgment in complex decision environments, where technology influences outcomes through behavioral pathways (Raisch & Krakowski, 2021; Yeung, 2018; Kellogg et al., 2020).

Further analysis of the mediation mechanism shows that the indirect effect of algorithmic intelligence on asset management outcomes through professional decision discretion is statistically significant (β = 0.12, 95% CI [0.05, 0.21]). The confidence interval does not include zero, confirming the presence of partial mediation. This indicates that while algorithmic intelligence directly improves outcomes, its indirect pathway through reduced discretion introduces a counterbalancing effect. The coexistence of positive direct and negative indirect effects provides strong empirical support for the Precision–Discretion Paradox.

These findings are consistent with prior studies on automation bias and algorithmic governance, which suggest that increased reliance on algorithmic systems may reduce human interpretive capacity (Raisch & Krakowski, 2021). However, this study extends the literature by demonstrating that such effects are institutionally conditioned, particularly by governance structures. These findings also align with emerging evidence in fintech research showing that algorithmic systems reshape decision authority through indirect behavioral mechanisms rather than purely technical effects (Flores, 2025a).

4.8 Integrated Institutional Interpretation

The findings provide strong empirical support for the precision–discretion paradox as an institutional phenomenon. Algorithmic intelligence enhances analytical precision and short-term efficiency, but governance quality determines whether professional judgment is preserved or eroded. This supports institutional economics arguments that decision outcomes are shaped by organizational structures rather than by technical tools alone, particularly in highly regulated financial environments (Scott, 2014; Hund et al., 2021; Arner et al., 2020). In banking-managed UITFs and mutual funds, sustainable asset management outcomes emerge not from maximizing automation but from aligning algorithmic systems with governance frameworks that protect discretion, accountability, and fiduciary responsibility. These results echo recent policy warnings regarding systemic risks associated with homogeneous algorithmic adoption and weak oversight (BIS, 2023; OECD, 2023).

While the findings support the precision–discretion paradox, alternative explanations may also be considered. First, the observed reduction in professional discretion may reflect not a loss of autonomy but a rational adaptation to increasingly data-rich environments, where reliance on algorithmic output enhances efficiency rather than constrains judgment. Second, the positive effects of algorithmic intelligence on asset management outcomes may be driven

by standardization benefits rather than true improvements in decision quality. Third, the moderating role of banking architecture may capture broader institutional maturity rather than governance alone. These alternative interpretations suggest that the relationship between algorithmic intelligence and decision-making is multifaceted and context-dependent, reinforcing the need for further empirical investigation. These results also resonate with financial stability literature warning that excessive reliance on homogeneous algorithmic systems without governance safeguards may amplify systemic risk (BIS, 2023; OECD, 2023; World Bank, 2017).

4.9 Implications for Theory and Practice

From a theoretical perspective, the study advances asset management literature by demonstrating that algorithmic intelligence should be analyzed as part of an institutional system rather than as a standalone technological innovation. The precision–discretion paradox provides a coherent framework for explaining why similar algorithmic tools may yield divergent outcomes across institutions, particularly when governance quality and decision autonomy differ (Scott, 2014; Raisch & Krakowski, 2021).

Practically, the findings suggest that banks and asset management firms should invest not only in advanced analytics but also in governance design, professional capability development, and decision accountability mechanisms. Regulators may also draw on these insights to refine guidance on algorithmic oversight and human-in-the-loop requirements. These implications are consistent with global regulatory directions emphasizing human-in-the-loop governance and accountable AI in financial systems (BIS, 2023; FSB, 2022; OECD, 2023).

5. Conclusion

This study sets out to examine how banking architecture and algorithmic intelligence jointly shape asset management decision-making and outcomes in banking-managed Unit Investment Trust Funds (UITFs) and mutual fund institutions. Anchored on the precision–discretion paradox, the research provides empirical evidence that algorithmic intelligence simultaneously enhances analytical precision and constrains professional decision discretion, with the ultimate effects on asset management outcomes being strongly conditioned by governance quality and institutional design.

The findings confirm that algorithmic intelligence has become a central driver of asset management efficiency in banking institutions. By enabling advanced portfolio optimization, real-time risk monitoring, and standardized decision processes, algorithmic systems materially improve consistency, speed, and analytical rigor in investment decision-making. These efficiency gains are particularly valuable in large-scale banking environments where complexity, regulatory demands, and fiduciary obligations place significant pressure on traditional judgment-based processes. In this respect, the study reinforces existing empirical evidence that algorithmic intelligence contributes positively to asset management outcomes when evaluated through conventional performance and efficiency metrics.

However, the study also reveals a critical institutional trade-off that has been underexplored in prior asset management literature. Increased reliance on algorithmic intelligence is associated with a measurable reduction in professional decision discretion among fund managers and investment decision-makers. This finding underscores the core insight of the precision–discretion paradox: gains in analytical precision do not occur in isolation but are accompanied by shifts in decision authority, interpretive autonomy, and professional judgment. In banking-managed asset management environments, where decisions are embedded within multilayered governance structures, algorithmic systems may function not merely as decision-support tools but as implicit decision authorities that narrow the space for contextual reasoning and managerial override.

A central contribution of this study lies in demonstrating that banking architecture and governance quality play a decisive role in shaping how this paradox unfolds. The empirical results indicate that strong governance frameworks, characterized by clear accountability structures, oversight mechanisms, escalation protocols, and human-in-the-loop decision processes, mitigate the constraining effects of algorithmic intelligence on professional discretion. In institutions with robust banking architecture, algorithmic systems complement professional judgment by enhancing informational quality while preserving interpretive flexibility and responsibility. Conversely, in environments where governance mechanisms are weak, opaque, or overly rigid, algorithmic precision may crowd out discretion, increasing the risk of mechanical decision-making and reduced adaptability.

From a theoretical perspective, the study advances asset management and institutional finance literature by reframing algorithmic intelligence as an institutionally embedded phenomenon rather than a neutral technological input. Existing research has largely focused

on the performance implications of algorithmic systems, often treating governance as a background condition. By contrast, this study foregrounds governance and institutional design as central explanatory variables, demonstrating that the effects of algorithmic intelligence on outcomes are mediated by professional discretion and moderated by banking architecture. The Precision–Discretion Paradox thus offers a coherent framework for integrating insights from institutional economics, decision architecture theory, and algorithmic governance research.

The policy and regulatory implications of these findings are substantial. As financial regulators and supervisory authorities increasingly confront the rapid diffusion of algorithmic and artificial intelligence systems in banking and asset management, the study highlights the limits of purely technical or model-centric regulatory approaches. Regulatory frameworks that focus exclusively on model validation, data quality, or computational accuracy may overlook the broader institutional dynamics through which algorithmic systems reshape decision authority and accountability.

The findings suggest that effective regulation of algorithmic asset management should place greater emphasis on governance design, decision accountability, and human oversight, rather than treating algorithms as self-contained risk objects. Regulatory guidance could be strengthened by explicitly requiring institutions to demonstrate how professional judgment is preserved within algorithmic decision processes, including clear documentation of override mechanisms, escalation pathways, and responsibility allocation. Such requirements align with emerging international policy discussions emphasizing human-in-the-loop and human-on-the-loop governance models in financial decision-making.

For banking institutions and asset management firms, the study underscores the strategic importance of aligning investments in algorithmic intelligence with parallel investments in governance capacity. Advanced analytics alone are insufficient to ensure sustainable asset management performance. Institutions must also cultivate professional capabilities, decision literacy, and organizational cultures that encourage critical engagement with algorithmic outputs rather than uncritical deference. Training programs for fund managers and analysts should emphasize not only technical competence but also interpretive judgment, scenario analysis, and ethical responsibility in algorithm-supported environments.

The study also carries implications for systemic risk and financial stability. Widespread adoption of similar algorithmic models across banking institutions, combined with weak governance oversight, may amplify correlated decision-making and reduce institutional

diversity in asset management strategies. By highlighting the moderating role of banking architecture, the findings suggest that governance heterogeneity may serve as an important buffer against systemic vulnerabilities arising from algorithmic homogeneity.

This study demonstrates that the future of asset management in banking institutions does not lie in choosing between algorithmic intelligence and human judgment, but in architecting institutional systems that integrate both effectively. Algorithmic precision, when embedded within robust governance frameworks, can enhance asset management outcomes while preserving professional discretion and accountability. Conversely, neglecting governance design risks transforming algorithmic intelligence from a tool of augmentation into a source of institutional rigidity. By articulating and empirically validating the Precision–Discretion Paradox, this study contributes a timely and institutionally grounded perspective to ongoing debates on algorithmic decision-making, governance, and the sustainable evolution of asset management in the banking sector.

6. Limitations and Future Research

Despite its contributions, this study is subject to several limitations that should be considered when interpreting the findings. First, the use of a cross-sectional research design limits the ability to establish causal relationships among variables over time. While the results provide strong empirical associations, future research may employ longitudinal designs to capture the dynamic evolution of algorithmic decision-making and governance structures in asset management. An important limitation of this study is the reliance on self-reported measures for all constructs, including asset management outcomes. While perceptual data provide valuable insights into decision-making processes, they may not fully capture objective investment performance. Future research is strongly encouraged to incorporate objective financial metrics, such as portfolio returns, Sharpe ratios, or risk-adjusted performance indicators, to enhance empirical validity.

Second, the study focuses on banking-managed UITFs and mutual fund institutions within a specific national context. Although this provides valuable institutional insights, the generalizability of the findings may be limited across different regulatory environments or financial systems. Comparative cross-country studies are recommended to examine how institutional and regulatory variations influence the Precision–Discretion Paradox.

Third, the study relies on perceptual measures obtained from professional respondents, which may introduce response bias despite efforts to ensure reliability and validity. Future studies may integrate objective performance data, such as portfolio returns or risk-adjusted metrics, to further validate the observed relationships.

Fourth, the absence of a control group of non-algorithmic decision environments limits direct comparison between traditional and algorithm-supported asset management approaches. Future research may explore experimental or quasi-experimental designs to isolate the effects of algorithmic intelligence more precisely.

Finally, while this study focuses on banking-based asset management, the proposed framework may be extended to other financial domains such as pension fund management, insurance underwriting, and digital lending platforms. Future research may also explore additional moderating variables, including organizational culture, regulatory intensity, and technological maturity.

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Institutional Review Board Statement

This study was granted ethical clearance by the Institutional Ethics Review Committee of La Consolacion. The study complied with established ethical standards for research involving human participants, including voluntary participation, informed consent, confidentiality, and data privacy protection.

AI Declaration

AI-assisted tools were used solely for grammar checking, and language refinement. All conceptualization, interpretation, analysis, and scholarly arguments presented in this study remain the sole responsibility of the author.

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